

NETAJI SUBHAS UNIVERSITY OF TECHNOLOGY



INFORMATION BROCHURE FOR ADMISSION TO

Ph.D. PROGRAMME

EVEN SEMESTER (WINTER) 2022-2023

Govt. of NCT of Delhi

NETAJI SUBHAS UNIVERSITY OF TECHNOLOGY

(Formerly Netaji Subhas Institute of Technology)

Azad Hind Fauj Marg

Sector-3, Dwarka, New Delhi-110078

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VICE CHANCELLOR'S MESSAGE



Prof. J.P. Saini

It gives me immense pleasure to announce that the Netaji Subhas University of Technology is commencing Ph.D. admissions for the Session 2022-2023. Netaji Subhas University of Technology has a 39-year-old legacy of excellence in education and technology development. Our vision, at NSUT, is to be a world class university through education, Innovation and research for the service of humanity. We nurture the young and talented brains of our students to make them successful professionals, strong leaders and thoughtful visionaries. The comprehensive curricula of our university are designed with an international perspective giving multiple opportunities to the students for their holistic development. The diverse extra-curricular activities and the various student societies make learning a joyous experience for our students. We are focused and committed towards empowering our students with the knowledge and skills that let them open their wings and fly high. The vast group of recruiters visiting our campus and the placement statistics of our university highlight the careful technological and comprehensive grooming that our students receive during their stay at NSUT.

To appreciate the research contributions, the university has instituted the Research and Patent awards from the year 2019 onwards. These awards comprise of a cash prize along with a certificate of merit.

I would like to assure you that becoming a part of the NSUT student fraternity will help you shape your academic future in a very fruitful way. I hope that this admission brochure shall provide all the needful information about admission procedures, and other related academic activities. I send my best wishes to the candidates applying for admissions to the Netaji Subhas University of Technology.

IMPORTANT DATES

Sr. No.	Event	DATES	Contact
1.	Online Application	15/10 TO 12/11	-----
2.	Submission of NOC by the candidates. <i>(who seek exemption from written test in the prescribed format available in Academic Section) in the Academic Section.</i>	Latest by 14/11/2022	Academic Section M- 9205475048 nsutphd2020@gmail.com
3.	Issue of Admit Card by CUMS <i>(All candidates except those who have been exempted from written test shall be issued an admit card)</i>	15/11/2022	CUMS admissions@nsut.ac.in
4.	Ph. D written test. <i>It shall be held in Pen-Paper mode at NSUT Main campus for all candidates except those who have been exempted from written test</i>	20/11/2022 2 hours Entrance Exam based on Research Aptitude/Methodology + Subject specific syllabus (50 MCQs each). TENTATIVE All Depts. except ECE, ICE & EE 9:00 – 11:00 AM For ECE & ICE only at 12:30-2:30 PM For EE only at 4:00-6:00 PM <i>(Actual date/time shall be displayed on Admit Card)</i>	Examination Section M- 9205475070
5.	Display of list of Ph.D. candidates who cleared written test.	24/11/2022	Examination Section M- 9205475070

6.	Verification of Original Documents (w.r.t. eligibility criteria & Qualifying degree) before Interview by the concerned Departmental Committee.	On the date of the Interview.	Concerned Department.
7.	Ph.D. Interviews (Schedule shall be displayed)	01/12 TO 08/12/2022	Academic Section M- 9205475048 nsutphd2020@gmail.com
8	Declaration of list of selected candidates	19/12/2022	Examination Section M- 9205475070
9.	Issue of Offer Letter from Academic Section after fee submission. Candidates will report to the office of Dean Academics.	20/12 TO 22/12/2022	Academic Section M- 9205475048 nsutphd2020@gmail.com
10.	Last date for fee submission and admission. Candidates will report to the office of Dean Academics.	22/12/2022	Academic Section M- 9205475048 nsutphd2020@gmail.com
11.	Meeting of RAC for newly selected candidates and allotment of Thesis Supervisors	LATEST BY 28/12/2022	Concerned Department
12.	Registration for Course Work for Even Semester PhD.	30/12/2022	Concerned Department DTCRC
13.	Classes begin for Odd Semester 2022	02/01/2023	

1. THE UNIVERSITY

NETAJI SUBHAS UNIVERSITY OF TECHNOLOGY (NSUT) is regarded as one of the premier engineering institutions in India. It traces back a glorious history of nurturing some of the finest minds in the country. Apart from being instrumental in providing quality education and research in various areas of the technical field, it also hosts a spectrum of established companies for its internship and placement drives. NSUT believes in building strong cultural roots among the students and strives to provide a balanced environment for their growth. More information about NSUT can be accessed at www.nsut.ac.in.

Govt. of NCT Delhi has expanded the NSUT in 2020 further into two more campuses namely **East Campus** (formerly Ambedkar Institute of Advanced Communication Technologies & Research) at Geeta Colony and **West Campus** (Formerly Ch. Brahm Prakash Government Engineering College) at Jaffarpur.

NSUT EAST CAMPUS (Formerly AIACTR) is functioning from the Campus located at Geeta Colony, East Delhi. The Institute has an area of 7.8 acres at Geeta Colony in which a State-of-Art Campus with ultra-modern facilities and lush green ambiance all around is built. The foundation stone of the campus was laid by the Honorable Chief Minister of Delhi Mrs. Sheila Dixit on 24th May 2006. The campus was built in a record time of 18 months by the PWD. The College has facilities like Centralized Air-Conditioning, RO System, lush green playground, Rain harvesting system, nursery etc.

NSUT WEST CAMPUS (Former CBPGEC) Jaffarpur, New Delhi was established in 2007 and is located on the outskirts of Delhi. The campus provides adequate opportunities to budding engineers and makes them ready to be adequately shaped in its three UG branches, namely Civil Engineering, Geoinformatics, Architecture and Mechanical Engineering with Electrical Vehicles (MEEV) and one PG course with M. Tech. (Environmental Engineering) in the Civil Engineering Department. Other Departments are the Department of Applied Science and Humanities that help students to imbibe basics of subjects like communication skills, physics, chemistry and economics and the Department of Allied Engineering in which subjects related to Electrical Engineering and Mechanical Engineering are dealt.

2. ABOUT THE RESEARCH PROGRAMMES, RESEARCH VACANCIES AND AWARDS.

At NSUT, most of the Departments/ Centers/Schools, across the three campuses, offer M. Tech and Ph.D. programmes. Our postgraduate programmes are highly flexible, which offer students a variety of courses and research topics to choose from.

2.1 RESEARCH VACANCIES

For the session 2022-23 (Even Semester), the maximum number of seats for admissions to various Ph.D. programmes are limited to

- (i) **Maximum Total Seats including URF/ Self Sponsored Scholars/ Scholars Sponsored from other agencies = 210**
- (ii) **Department wise seat distribution**

Sr. No.	Department	Maximum Seats including URF/ Self Sponsored/ agencies	Self Sponsored/ from other
1.	ECE (MAIN CAMPUS)	33	*
2.	ECE (EAST CAMPUS)	15	
3.	CSE (MAIN CAMPUS)	15	
4.	CSE (EAST CAMPUS)	13	
5.	IT (MAIN CAMPUS)	12	
6.	ME (MAIN CAMPUS)	10	
7.	ME (WEST CAMPUS)	02	
8.	ICE	49	
9.	EE	07	
10.	BSE	07	
11.	CIVIL (WEST CAMPUS)	24	
12.	DESIGN (MAIN CAMPUS)	04	
13.	MATHS (MAIN & EAST CAMPUS)	01	
14.	PHYSICS (MAIN & EAST CAMPUS)	06	
15.	CHEMISTRY (MAIN CAMPUS)	10	
16.	HUMANITIES AND SS (MAIN CAMPUS)	NIL	
17.	MANAGEMENT STUDIES	02	

Note:

1. University reserves the right to allot a supervisor to the selected candidates from any of its campuses.
2. University reserves the right to change the number of seats. Refer to the research profile of departments for maximum possible seats allocated to various departments. Also, if any government communication is received at any time before admission the same will be applicable during admission.
Refer to (www.nsut.ac.in) for revised Ph.D. Regulations 2022.

2.2 AWARD CATEGORIES AND SELECTION CRITERIA

2.2.1 Award Categories and Selection criteria

Following are the categories for the research and patents awards.

(i) **Awards for Research Papers:** Following are the three categories for the research awards.

a). **Outstanding Research Awards:** A cash prize of Rs. 5,00,000/- (Rupees Five Lakhs Only) is awarded along with a certificate of merit.

Selection Criteria: The paper must be published in the following journals.

1. Nature (British Multidisciplinary Scientific Journal)
2. Science (Academic journal of the American Association)
3. Harvard Business Review (Management magazine published by Harvard Business Publishing, a wholly owned subsidiary of Harvard University)

b). **Premier Research Awards:** A cash prize of Rs. 1,00,000/- (Rupees One Lakh Only) is awarded along with a certificate of merit.

Selection Criteria: The paper must be a below listed societies/journals paper of impact factor at least one (01) and indexed as SCI/SCIE/SSCI.

1. American Mathematical Society
2. American Physical Society
3. American Society for Civil Engineers (ASCE)
4. American Society for Mechanical Engineers (ASME)
5. American Society of Testing Materials (ASTM)
6. Association for Computing Machinery (ACM) Transactions
7. IEEE Transactions/Journals/Letters/Reviews

8. IET Transactions/Journals/Letters/Reviews
9. Institute of Civil Engineering Publishing, London
10. Institute of Mechanical Engineering, London
11. Proceedings of Royal Society

In addition to the above list, the SCI/SCIE/SSCI journals with impact factor equal to or more than Seven (07) are also considered for this award.

c). **Commendable Research Awards:** A cash prize of Rs. 50,000/- (Rupees Fifty Thousand Only) is awarded along with a certificate of merit.

Selection Criteria: The paper must be a journal (other than listed in category A and B above) paper of impact factor at least two (2.0) and indexed as SCI/ SCIE/SSCI.

(ii) **Awards for Patents:** Following are the two categories for the awards on patents.

a). **Premier Patent Awards:** A cash prize of Rs. 5,00,000/- (Rupees Five Lakhs Only) is awarded along with a certificate of merit for US / UK patent.

b). **Commendable Patent Awards:** A cash prize of Rs. 2,00,000/- (Rupees Two Lakhs Only) is awarded along with a certificate of merit for Indian patents.

2.2.2 Regulations for Distribution of Award Prize:

a). The distribution of prize money is implemented on equal contribution basis and therefore the authors get equal share.

b). Only the authors from NSUT are eligible for the awards and the prize money corresponding to outside NSUT authors, if any, is deducted.

3. PH. D. ADMISSIONS

(Refer to (www.nsut.ac.in) for revised Ph.D. Regulations 2022.

3.1 ELIGIBILITY CRITERIA

(A). Engineering/Technology/Management: An applicant possessing Bachelor's and Master's Degrees in Engineering / Technology / Management in the respective discipline with a first class/60% or equivalent Cumulative Grade Point Average (CGPA) in any one of the Degree shall be eligible to apply for admission to Ph.D. programme of the University in Engineering/Technology/Management streams.

(B). Sciences/Humanities/Social Sciences: An applicant possessing a Master's Degree in Sciences/Humanities/Social Sciences in the respective discipline or equivalent with a minimum of 55% of marks or equivalent Cumulative Grade Point Average (CGPA) shall be eligible to apply for admission to Ph.D. programme of the University in Sciences/Humanities/Social Sciences streams.

In case the equivalence between the percentage of marks and Cumulative Grade Point Average is not defined by the University from where the candidate has obtained the qualifying degree then the most recent University Grants Commission/All India Council for Technical Education equivalence criteria shall be applicable.

There shall be no age limit for admission to Ph.D. programme of the University.

Refer to the information about the concerned department, as given below, for the details of eligibility with respect to Bachelor's/Master's Degree in Engineering/Technology/Sciences/Management/Humanities/Social Sciences.

3.2 CATEGORIES OF ADMISSION

- a. Research scholars with University Research Fellowship (URF).
- b. Research scholars with fellowship from their sponsoring agencies (UGC/DST/CSIR/DBT/ICMR etc.).
- c. Research scholars without any fellowship (self-financing mode).

3.3 RESERVATION/RELAXATION

- a. In all the Ph.D. programmes of the University, reservation of seats for applicants in all the categories, including SC/ST/EWS/OBC (non-creamy layer, Delhi only)/Differently-abled applicants, shall be in accordance with the policies of Govt. of National Capital Territory of Delhi. Further, for the EWS category, the acceptable category certificate shall be from the preceding financial year.
- b. SC/ST/Differently-abled applicants may be permitted 5% marks relaxation in the eligibility requirement as prescribed in Clause-5.
- c. The vacant seats of the ST category shall be converted to the SC category. After this conversion, the remaining vacant seats, if any, from any reserved category shall be filled from the un-reserved category.

- d. Reservation shall be applicable at the University level.
- e. OBC (non-creamy layer) applicants outside Delhi shall be treated in the general category.

3.4 SELECTION PROCEDURE FOR ADMISSION

- a. The Research Scholars shall be admitted in a two-stage process - an Entrance Written Test and an Interview. The department-wise cut-off marks for the Entrance Written Test shall be dynamic, as described below.
- b. The candidates securing 50% or above of the average marks of the top 5 candidates shall be eligible to be called for the interview. There shall be a 5% relaxation (50% to 45%) for SC/ST/Differently-abled applicants.
- c. The Interview Committee shall examine whether the candidate possesses research aptitude and competence to carry out the research in the intended area. Candidates eligible for interview are required to make a powerpoint presentation of approximately 10 minutes in the area of their research interest.
- d. The weightage of the entrance test and the interview shall be 70% and 30%, respectively.
- e. The syllabus for the entrance test shall consist of questions, with equal weightage, that test Research/Analytical/Comprehension/Quantitative Aptitude and the subject-specific domain. There shall be only one question paper for the entrance test for each Department.
- f. The candidates with research fellowship (from funding sources other than the University such as UGC/CSIR etc.) identified by the Board of Research Studies shall be exempted from the written test. However, they shall have to appear in the interview.
- g. GATE-qualified candidates admitted to the M.Tech. programme in engineering streams are permitted to enroll for the four year, M.Tech. + Ph.D., Dual degree programme of the University. These candidates shall be required to secure a minimum of 7.0 CGPA for the first year to be eligible for admission. Such candidates shall not be required to follow the regular Ph.D. admission procedure of the University. However, they may be issued an offer letter directly.
- h. These candidates shall receive their M.Tech. fellowship from AICTE for the first two years. From the third year onwards they shall be eligible

for University Research Fellowship. Further, these Scholars shall also be required to qualify the Pre-Ph.D. courses as described in Clause 11.

- i. The Scholars opting for the dual degree programme shall be governed by University guidelines issued from time to time.
- j. Project staff under projects, sponsored by the Department of Science and Technology/University Grants Commission/any Government agency, Industry or centres established from a grant-in-aid from Government or international agencies at the Netaji Subhas University of Technology, may be given administrative clearance of the concerned Principal Investigator of the said project/centre and approval of the respective Chairman Board of Research Studies and Vice-Chancellor. The project staff under projects shall be required to fulfill the eligibility conditions as laid down in Clause-5 of the regulations. and appear in both the entrance test and interview.
- k. The Candidates from Research & Development Organizations/ Institutions/ Public Sector Undertakings/Industries/Foreign Universities which have a Memorandum of Understanding with Netaji Subhas University of Technology may be exempted from the entrance examination. These candidates can be called directly for the interview as sponsored candidates subject to the fulfillment of the minimum entry qualification for the Ph.D. degree as given in Clause-5 of the regulations.

Provided that-

- (i) The applicant has at least two years of experience in a regular capacity;
- (ii) The applicant shall prove to the satisfaction of the University that his official duties permit him to devote sufficient time to research;
- (iii) The applicant can devote sufficient time to pursue research in the concerned Department of the Netaji Subhas University of Technology daily or if sufficient facilities for research are available at the applicant's place of work in the chosen field of research. Provided that the Board approves the same as his/her second place of work.
- (iv) He/she shall be required to reside at the Netaji Subhas University of Technology until completing his/her coursework. This condition of

minimum residence shall be automatically waived off for the candidate working in the Delhi National Capital Region.

- i.** The regular employees of NSUT/any other Engineering Education Department / Institution of Government of National Capital Territory of Delhi desiring to register for the Ph.D. Programme, may be exempted from the entrance examination and may be called directly for the interview subject to submission of a No-Objection Certificate from the competent authority of the respective Institution. Such employees shall be required to fulfill the eligibility conditions as laid down in Clause-5 of the regulations.

3.5 FOREIGN NATIONALS/OVERSEAS CITIZENSHIP OF INDIA (OCI)

- a.** Foreign nationals/ OCI fulfilling the eligibility criteria may be registered for Ph.D. programme.
- b.** Foreign nationals/OCI shall be exempted from the written test but must appear in the interview in online/physical mode. They may be admitted based on their performance at the interview.
- c.** The medium of instructions shall be English only.
- d.** The admission of foreign nationals/OCI shall be subject to the verification of equivalence of their qualifying degrees from the Association of Indian Universities
- e.** They must provide evidence of language competence in English.

3.6 FINANCIAL ASSISTANCE

- a.** The University offers a total of 150 University Research Fellowships (URF) for a duration of 3 years. The monthly University Research Fellowships (URF) fellowship amount is of Rs 32500/- (consolidated) Further the fellowship of URF may be enhanced to 36,000/- per month after 2 years subject to fulfillment of the conditions laid down by Research Council and duly approved by the Senate.
- b.** The fellowship duration shall generally be of three calendar years or till the thesis is submitted, whichever is earlier. Fellowship may be extended by a maximum of one year by the competent authority on the Board of Research Studies recommendation. Continuation of the fellowship is subject to satisfactory research performance as per the approved guidelines of the University issued from time to time and

satisfactory academic performance in the discharge of responsibilities assigned to URF Scholar.

- c. The admission to the programme and award of fellowship are not linked. Admission to any programme does not guarantee the award of fellowship. Those who are not awarded fellowships can continue with the programme as self-financing Scholars.
- d. **The fellowship may be released on a monthly basis from the date of provisional registration. However, the fellowship may be discontinued in case of a ‘Unsatisfactory’ progress recommendation by the Research Advisory Committee. The fellowship shall be resumed only after the scholar has secured ‘Satisfactory’ progress in the next assessment.**
- e. In addition to the research work, all the University Research Fellows of the University shall have to undertake Teaching assignments/Practical classes/Tutorials to an extent of 6-8 hours per week and shall also be assigned other duties like checking of assignments, invigilation duties, etc. as prescribed from time to time.

3.7 FEE STRUCTURE

S. No.	Item of Fees	1 st Year	2 nd Year	3 rd Year and onwards
1.	University Fund			
	A. Tuition Fee	9700	10600	10600
	B. University Fee	8600	9500	9500
2.	A. Student Fund	1500	1500	1500
	B. Facilities & Service Charges for the student Development	3000	3000	3000
3.	Chhatra Vittiya Sahayta Evam Protsaahan Kosh (CVSPK)	-	-	-
4.	Alumni	1000	0	0
5.	Examination Fee	5000	0	0
	Grand Total	28800	24600	24600

3.8 PROCEDURE FOR ONLINE APPLICATION

1. Separate application forms should be filled for Ph.D. programme for each Department.
2. Filling false information will lead to rejection of application/cancellation of admission.
3. **APPLICATIONS OF CANDIDATES, WHOSE RESULTS OF QUALIFYING EXAMINATION (B.TECH/M.TECH, AS APPLICABLE), IS LIKELY TO BE DECLARED ON OR BEFORE LAST DATE GIVEN IN THIS INFORMATION BROCHURE, WILL ALSO BE ACCEPTED.** However, the Screening committee/Interview committee shall obtain an undertaking from the candidate, stating that his/her admission shall stand canceled if he/she fails to satisfy the eligibility criteria after declaration of result/admission.

3.9 REFUND OF FEES

Processing/ application fee is non-refundable. The amount of fees/other charges deposited by the students may not be refunded if the candidates do not join the programme or leave the University and intimate the same after the last date of registration. Fee refund shall be done as per the University policy.

3.10 ORIGINAL DOCUMENTS REQUIRED AT THE TIME OF INTERVIEW /ADMISSION.

1. 10th Certificate (Showing Date of Birth)
2. 12th Certificate
3. B. Tech./UG (Mark sheets and degree certificates)
4. M. Tech./PG (Mark sheets and degree certificates)
5. Migration Certificate from last attended University.
6. Category certificate if applicable.
7. NOC from current Employer (Applicable to all the candidates who are currently employed)

4. AMENITIES ON THE CAMPUS

1. Dr. APJ Lecture Theatre Complex	This smart Lecture Theatre Complex is energy-efficient, and has cutting-edge technology as its essential feature in every aspect of usage. It has ten Smart Lecture Halls with a seating capacity of 125 each, and a Multipurpose Hall with 270 audience seating capacity. These lecture halls have been equipped with audio/video system for
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	<p>recording and live streaming of lectures, VRV air-conditioning, Godrej furniture, CCTV surveillance system, acoustics etc.</p>
2. Central Computer Center	<p>Central Computer Centre at NSUT is a state-of-the-art facility for nurturing the computing requirements of its students and faculty. It is well equipped with 400 All-in-One Desktop Computers with best-in-class configuration. These computers are populated with all the software required by the students in their curriculum. Central Computer Centre looks after the operation of the campus wide network (wired and Wifi) of NSUT which covers every nook and corner of the campus. NSUT has a 1 Gbps Internet Link from NKN which is being upgraded to 10 Gbps in the coming few months. Computer Centre also manages the University's Web server, Email facility for every NSUTian and Cloud based University Management System.</p>
3. State of the Art Studio	<p>State of the art Studio has been set up for recording and live streaming of lectures, interviews and debates etc. This studio will also be used for imparting skill based short-term courses in photography, video editing, cameraman etc.</p>
4. Accommodation	<p>Few hostel seats are reserved for Research Scholars. However, no family accommodation is available.</p>
5. World Class Skill Centre	<p>NSUT has set up a World Class Skill Centre.</p>
6. Shopping	<p>There is a Small Shopping Complex catering to the daily needs of the students through KendriyaBhandar, Amul Milk and Stationery Shop.</p>
7. Sports Facility	<p>There is a full-fledged Sports Complex having 400 MTR Synthetic Running Track, Cricket Ground with Net practice facilities, Football Ground and Basket Ball courts, Lawn Tennis courts, Volleyball courts, a Kabaddi ground, a Netball ground and sand volleyball. The student activity centre having the facilities of air-conditioned Gymnasium, Pool and billiards table, Table Tennis facility, Indoor games like chess, carrom etc are the prominent feature of the</p>

	student activity centre. The open garden Gym is another facility used by students and residents of the University.
8. Medical Facility	Medical Facility University has its own Medical Centre with a Resident Doctor at Campus
9. Banks	University has two banks namely State Bank of India and Andhra Bank on Campus.
10. Other Amenities	University has its own full-fledged Sports Complex, Gym, Student Centre, Library etc.
11. Girls Hostels for Foreign Students	A Girls Hostel to accommodate 52 foreign students has been constructed with State-of-Art facilities.
12. Boys Hostel for Foreign Students	A Boys Hostel to accommodate 52 foreign students has been constructed with State-of-Art facilities.
13. T&P Cell	A Fully air-conditioned building has been constructed for the Training & Placement Cell.

5. DEGREE OFFERING FACULTY/DEPARTMENTS

5.1 Faculty of Information Communication and Technology (ICT)

- 5.1.1 Department of Electronics and Communication Engineering (Main Campus)
- 5.1.2 Department of Electronics and Communication Engineering (East Campus)
- 5.1.3 Department of Computer Science and Engineering (Main Campus)
- 5.1.4 Department of Computer Science and Engineering (East Campus)
- 5.1.5 Department of Information Technology (Main Campus)

5.2 Faculty of Electrical and Mechanical Engineering

- 5.2.1 Department of Mechanical Engineering (Main Campus)
- 5.2.2 Department of Mechanical Engineering (West Campus)
- 5.2.3 Department of Instrumentation and Control Engineering (Main Campus)
- 5.2.4 Department of Electrical Engineering (Main Campus)

5.3 Faculty of Interdisciplinary Studies.

- 5.3.1 Department of Biological Sciences Engineering (Main Campus)

5.4 Faculty of Infrastructure Technology

- 5.4.1 Department Of Civil Engineering (West Campus)
- 5.4.2 Department of Architecture (West Campus)

5.5 Faculty of Design

- 5.5.1 Department of Design (Main Campus)

5.6 Faculty of Sciences

- 5.6.1 Department of Mathematics (Main and East Campus)
- 5.6.2 Department of Physics (Main and East Campus)
- 5.6.3 Department of Chemistry (Main and East Campus)

5.7 Faculty of Humanities and Social Sciences

- 5.7.1 Department of Humanities and Social Sciences (Main and East Campus)

5.8 Faculty of Management Studies

- 5.8.1 Department of Management Studies (Main Campus)

6. RESEARCH PROFILE OF DEGREE OFFERING FACULTY/ DEPARTMENTS

6.1 FACULTY OF INFORMATION COMMUNICATION AND TECHNOLOGY (ICT)

6.1.1 DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING (MAIN CAMPUS)

1. The Department

The Department of Electronics and Communication Engineering, Netaji Subhas University of Technology (formerly Netaji Subhas Institute of Technology) was established in 1983. All through its sparkling history of 36 years, the department of ECE has been known for its exceptionally strong Under-Graduate, Post-Graduate and Research programmes.

The department has always been on a progressive path, thanks to the experienced and dedicated faculty members who have a strong commitment towards providing quality engineering education and research. The Department has 20 faculty members, 07 Professors, 01 Associate Professors, 08 Assistant Professors, 02 Honorary Professor, 01 Adjunct faculty and 01 Visiting faculty. Most of the faculty members are Doctoral degree holders.

2. Courses Offered

The Department offers 01 Undergraduate (UG) and 03 Postgraduate (PG) and Ph.D programmes. The UG programme was started in 1983, right from the inception of the Institute. The first PG programme on Signal processing in ECE was started in the year 1999. The second PG programme on Embedded Systems and VLSI started in the year 2016. The rapid developments in the field of communication triggered the inception of another PG programme on Communication and Networking in year 1999. The Master of Technology programmes are two-year course-based programmes. Students take about 12 courses from within and outside the department, according to the programme requirements. The courses offered are of high standard, many include advanced topics and topics based on recent research. In addition, the Department also offers high quality research programmes at the doctoral level.

To keep in pace with the current technological advancements, the UG and PG curriculum has been recently modified so that the students get a feel of what exactly is happening outside in the tech-world.

- B.Tech.-Electronics and Communication Engineering: 180 students - Eight Semesters - Choice Based Credit System
- B.Tech.-Electronics and Communication Engineering (Internet of Things): 60 students - Eight Semesters - Choice Based Credit System
- M.Tech. –Signal Processing: 30 students - Four Semesters - Choice Based Credit System
- M.Tech. –Embedded Systems and VLSI :30 students - Four Semesters - Choice Based Credit System
- M.Tech - Communication & Networking :18 students - Four Semesters - Choice Based Credit System
- Doctor of Philosophy (Ph.D.)

3. Areas of Research and Available Seats

Presently our faculty is undertaking research in following broad areas:

- **Analog Signal Processing, and VLSI**

Modern Filter Design, Bipolar and CMOS Analog Integrated Circuits, Advanced Active Network Synthesis, Analog Signal Processing, Current-mode Analog Circuits, Analog VLSI Circuits and Systems, Low voltage low power design techniques, Fractional order analog and digital circuits, Low power high performance digital CMOS circuits, CAD for VLSI Design, Automated design and optimization of analog and mixed-signal integrated circuits, Integrated circuit design using memristors.

- **Wireless and Optical Communications**

Optical communication, Optical networks, Free space optical communication, Diversity techniques, Space-time coding, Cooperative communication and free space optics. Power line communication and molecular communication, Wireless communication, wavelets, Multiple-input multiple-output (MIMO) systems, Multi-user based communications, Networking.

- **Signal and Image Processing**

Digital signal processing, Filtering theory, Quantum signal processing, Multimedia security, Image and audio compression. Pattern recognition,

Wave digital filters, Soft computing Techniques, FPGA-based Implementation of DSP systems, Optimization, DSP Algorithms and applications, Speech, Image processing and computer vision, Modeling and simulation, Artificial intelligence, Machine learning, Artificial neural networks.

- **RF and Microwave Engineering**

Antennas, Metamaterial, Antenna arrays, Microwave components, Electromagnetics, Optimization techniques, Antennas & Radio wave propagation, Microwave filter, Antenna designs.

- **Computer Networks**

Routing and Survivability of optical networks, Performance of Elastic optical network, Performance of SDM-WDM optical networks, Application of Machine learning in Optical Networks.

- **AI and Machine learning in computer vision**

Pattern Recognition, Feature Extraction/Selection, Classification, Segmentation, and reconstruction using deep learning techniques. Learning important features using machine learning, time series data analysis, wearable sensors, medical images/signals (CT, DTI, MRI, fMRI, ECG), Speech processing, natural language processing, fraud detection, graph analytics/mining, deep learning on graphs or probabilistic graphical models. Mathematical optimization and dimensionality/model reduction in neural networks.

- **Nanoelectronics**

Nanoelectronics, Synthesis and characterization of advanced materials, Fabrication of electronic devices, Room temperature based highly selective and sensitive gas sensors, Broadband photodetectors, Applications of graphene and other two-dimensional materials, Mixed dimensional heterojunctions.

3.1 Tentative Seats:

For the session 2022-23 (Even semester) the maximum number of seats in the Department of ECE are limited to

- 1. Seats with university fellowship: 16**
- 2. Seats without university fellowship: 17**

University reserves the right to change the number of seats.

***The table below indicates the maximum number of vacancies available in various areas of research. However, the total number of seats are as given above**

S. No.	Area of Research	Faculty	Maximum no. of vacancies	
			With Univ. fellowship (TRF/URF)	Without Univ. Fellowship. Self-Sponsored, UGC, CSIR, DST RF and others
1.	Analog Signal Processing, VLSI	1. Prof. Raj Senani	01	NIL
		2. Prof. Maneesha Gupta	NIL	NIL
		3. Prof D. K. Upadhyay	NIL	NIL
		4. Dr. Kunwar Singh	NIL	NIL
		5. Dr. Urvashi Bansal	NIL	01
		6. Dr. Bhawna Agarwal	01	01
2.	Wireless Communication, Optical Communication	1. Prof. S P Singh	01	01
		2. Prof. Parul Garg	01	NIL
		3. Prof. Sujata Sengar	01	01
		4. Dr. Ankit Garg	01	01
		5. Dr. Sukhbir Singh	01	01
		6. Dr. Ritu Raj Singh	01	NIL
3.	Signal and Image Processing	1. Prof. Maneesha Gupta	NIL	NIL
		2. Prof. Harish Parthasarathy	NIL	NIL
		3. Prof. Parul Garg	NIL	01
		4. Prof. Jyotsna Singh	02	02

		5. Dr. Tarun Rawat	02	01
		6. Dr. Amit Singhal	NIL	NIL
4.	Computer Networks	1. Prof. S P Singh	01	NIL
		2. Prof. Sujata Sengar	01	01
5.	RF and Microwave Engineering	1. Prof. D K Upadhyay	NIL	01
		2. Prof. Rajveer S. Yaduvanshi	NIL	NIL
6.	AI and Machine Learning in computer vision	1. Dr. Satya P Singh	02	03
7.	Nanoelectronics	1. Dr. Neeraj Goel	NIL	02

The number of candidates to be taken by faculty is counted only once and in any one of the research fields available.

Note: The vacancies displayed in the Table above against the same faculty member in different research groups are only indicative in nature. Vacancy in one research area belonging to a faculty member is convertible to a vacancy in another research area belonging to the same faculty member.

4 Faculty Profile

4.1 Prof. Shree Prakash Singh

1. Designation, Qualifications: Professor and Head of the Department, Ph.D.
2. Areas of Interest: Optical Networks, Computer Networks, Optical wireless communication.
3. E-mail: sps_nsit@yahoo.co.uk
4. Phone: 9205475027
5. Home Page: <http://www.nsit.ac.in/faculty/sps/>
6. Selected Publications:
 - a. Shreesh Kumar Shrivastava, Sujata Sengar and **Shree Prakash Singh**, "On the effect of Incorrect Channel Condition Information on Modified Switching scheme of Hybrid FSO/RF System," **IEEE**



Transactions on Cognitive Communications and Networking
DOI: 10.1109/TCCN.2019.2935193.

- b. Soyinka Nath, **Shree Prakash Singh** and Sujata Sengar, “A novel multi-quality of service system design: Integration of hybrid free space optical/RF, cognitive hybrid and free space optical links”,**Microwave and Optical Technology Letter**, 04 September 2021,<https://doi.org/10.1002/mop.33029>.
- c. Shreesh Kumar Shrivastava, Sujata Sengar and **Shree Prakash Singh**, “Effect of Pointing Error on the Performance of Improved Modified Switching Scheme of Hybrid FSO/RF System under Mixture Gamma Atmospheric Turbulence”, **IETE Journal of Research**, January 2022.<https://doi.org/10.1080/03772063.2021.2021818>

7.Bio-Sketch:

Prof. Shree Prakash Singh holds a Doctoral Degree in Optical Networks from the Indian Institute of Technology, Delhi (IITD), India, in 2007. Presently he is Professor and Head of Department of Electronics and Communication Engineering, Netaji Subhas University of Technology (formerly NSIT), New Delhi. His current area of research is Optical Networks, Optical wireless communication. He has published 60 papers in reputed International/National and Journals and Conferences. He is a life member of ISTE. Prof. Singh has been awarded the IETE K. S. Krishnan Memorial Best paper award for his work in 2000. He is reviewer of few International Journals. His research area includes Green network, Elastic optical network, Free space communication.

4.2 Dr. Harish Parthasarathy

1. Designation, Qualifications: Professor, Ph.D.
2. Areas of Interest: Signal and Image Processing, Quantum Signal Processing,
3. E-mail: harisignal@yahoo.com
4. Phone: 011-25000082
5. Home Page: <http://www.nsit.ac.in/faculty/hp/>
6. Selected Publications:
 - a. V. K. Pandey, J. Singh, H. Parthasarathy, “ Algebraic technique for computationally efficient Hahn moment invariants,”



Multidimensional Systems and Signal Processing, October 2018, Volume 29, [Issue 4](#), pp 1529–1552.

- b. Rohit Singh, Jyotsna Singh, Harish Parthasarathy, "Estimating the Angular Dynamics of a Fan Window Stroboscope from Noisy Quantum Image Measurements", *Quantum Information Processing*, 17(9), September 2018. DOI: [10.1007/s11128-018-2000-0](https://doi.org/10.1007/s11128-018-2000-0).
 - c. Garg, N., Parthasarathy, H. & Upadhyay D. K., "Belavkin filter for mixture of quadrature and photon counting process with some control techniques," *Quantum Inf. Process* (2018) 17: 59. DOI: <https://doi.org/10.1007/s11128-018-1831-z>
7. **Bio-Sketch:** Dr. Parthasarathy is a Professor in the Department of Electronics and Communication Engineering, Netaji Subhas University of Technology (formerly Netaji Subhas Institute of Technology), New Delhi. Dr. Parthasarathy has guided 10 Ph.D. theses and more than 30 M. Tech. theses. He has published more than 80 research papers in reputed International Journals, Proceedings of International and National Conferences, and 10 Books. He is a Fellow of IETE. His research interests are in the areas of Digital Signal Processing, Soft Computing Techniques, Image Processing, Quantum Signal Processing.

4.3 Prof. Maneesha Gupta

1. Designation, Qualifications: Professor, Ph.D.
2. Areas of Interest: Analog and digital signal processing, Low voltage low power design techniques, Fractional order analog and digital circuits
3. E-mail: mgupta@nsut.ac.in
4. Phone: 011-25000120
5. Home Page: <http://www.nsit.ac.in/faculty/mg/>
6. Selected Publications:
 - a. A. Soni, M. Gupta, "Performance Evaluation of Different Order Fractional Chebyshev Filter using Optimization Techniques", *International Journal of Electronics Letters* (Taylor & Francis), Feb 2019, doi: 10.1080/21681724.2019.1584915.
 - b. AshuSoni, Nivedita Sreejeth, Varun Saxena & Maneesha Gupta "Designing of fractional order Butterworth filter", *Arabian Journal for Science and Engineering*, Oct. 2019, doi:10.1007/s13369-019-04225-7.
 - c. Kumar, P., Gupta, M. & Singh, K. "Performance Analysis of Charge Plasma Based Five Layered Black Phosphorus-Silicon



Heterostructure Tunnel Field Effect Transistor” Silicon (2020).
<https://doi.org/10.1007/s12633-020-00376-7>.

7. Bio-Sketch: Professor Maneesha Gupta received the B.E and M.E, in Electronics & Communication Engineering from Government Engineering College, Jabalpur, India, and Ph.D. from the department of Electrical Engineering, Indian Institute of Technology, New Delhi, India. She is currently working as a Professor in Department of Electronics and Communication Engineering, Netaji Subhas University of Technology, New Delhi, India. Her teaching and research interests are Analog and digital signal processing, Low voltage low power design techniques, Fractional order analog and digital circuits and switched capacitors circuits. She has authored or co-authored over 150 papers in various journals and conferences in these areas of research.

4.4 Prof. Parul Garg

1. Designation, Qualifications: Professor, Ph.D.
2. Areas of Interest: Cooperative communications, free space optics, visible light communication. Power line communication
3. E-mail: parul_saini@yahoo.co.in, parul@nsit.ac.in
4. Phone: 011-25000122
5. Home Page: URL: <http://www.nsit.ac.in/faculty/pg/index.html>
6. Selected Publications:
 - a. Akash Gupta and Parul Garg, “Statistics of SNR for an indoor VLC system and its applications in system performance,” *IEEE Communication Letters*, vol. 22, no. 9, pp.1898-1901, September 2018.
 - b. Shashikant, Parul Garg and Prabhat Kumar Sharma, “Location tracking for indoor VLC systems using intelligent photodiode receiver,” *IET Communications*, vol. 12, no. 13, pp. 1589—1594, August 2018.
 - c. Akash Gupta, Nikhil Sharma, Parul Garg, and Mohamed S. Alouini, “Cascaded FSO-VLC Communication System,” *IEEE Wireless Communication Letters*, vol. 6, no. 6, pp. 810—813, December 2017.
7. Bio-Sketch: Prof. Parul Garg received B.Sc.(Engg.) and M.Sc.(Engg.) degrees from Aligarh Muslim University, Aligarh, India, in 1990 and 1994, respectively, all in Electronics Engineering and her Ph. D. degree



in Electrical Engineering from Indian Institute of Technology, Delhi in 2005. From May 1996 to July 2000, she worked as a faculty member at the Institute of Engineering and Technology, Lucknow, India. Since July 2000, she has been working as a faculty member at the Netaji Subhas Institute of Technology, New Delhi, India. Her current work mainly focuses on different aspects of wireless communications with emphasis on cooperative communication, free space optics, visible light communication, power line communication, physical layer security etc. Five research scholars have completed their Ph.D. and, currently, four research scholars are working under her guidance. Currently serving as Associate Editor of IEEE Access. Currently serving as the Member of editorial board of AEU International Journal of Electronics and Communication

4.5 Prof. Sujata Sengar

1. Designation, Qualifications: Professor and Dean (Academic), Ph.D.
2. Areas of Interest: speech processing, signal processing and wireless optical communication
3. E-mail: nsit_sujata@yahoo.com
4. Phone: 9205475100
5. Home Page: <http://www.nsit.ac.in/faculty/ss/>
6. Selected Publications:
 - a. Soyinka Nath, **Sujata Sengar**, Shreesh Kumar Shrivastava and Shree Prakash Singh, “Impact of Atmospheric Turbulence, Pointing Error and Traffic Pattern on the Performance of Cognitive Hybrid FSO/RF System”, **IEEE Transactions on Cognitive Communications and Networking** DOI: 10.1109/TCCN.2019.2952116.
 - b. Soyinka Nath, **Shree Prakash Singhand** Sujata Sengar, “A novel multi-quality of service system design: Integration of hybrid free space optical/RF, cognitive hybrid and free space optical links”,**Microwave and Optical Technology Letter**, 04 September 2021,<https://doi.org/10.1002/mop.33029>.
 - c. Shreesh Kumar Shrivastava, Sujata Sengar and **Shree Prakash Singh**, “Effect of Pointing Error on the Performance of Improved Modified Switching Scheme of Hybrid FSO/RF System under



Mixture Gamma Atmospheric Turbulence”, **IETE Journal of Research**, January 2022. <https://doi.org/10.1080/03772063.2021.2021818>

7. Bio-Sketch:

Sujata Sengar received her B.Sc. Engg. (Hons) and M.Sc. Engg. (Hons) degree in Electronics and Communication Engineering from Aligarh Muslim University, Aligarh, India in 1988 and 1990. She holds a Doctoral Degree in Wireless Communication from the Indian Institute of Technology, Delhi (IITD), India, in 2014. She joined as faculty at Netaji Subhas Institute of Technology, Delhi. Presently she is working as Professor and Dean (Academic) at Netaji Subhas University of Technology, New Delhi, India. She is life member of ISTE. Prof. Sengar has been awarded the IETE K. S. Krishnan Memorial Best paper award for her work in 2000. Her area of interest is **optical networks, signal processing and wireless optical communication.**

4.6 Prof. D. Upadhyay

1. Designation, Qualifications: Professor, Ph.D.
2. Areas of Interest: RF and Microwave Engineering, Signal and Image Processing, Analog Signal Processing, and VLSI
3. E-mail: upadhyay_d@rediffmail.com
4. Phone: 9205475072
5. Home Page: <http://www.nsit.ac.in/faculty/dku/>



6. Selected Publications:

- a. Karishma Sharma, Dharmendra Upadhyay, Harish Parthasarathy and Rohit Gurjar, “Analysis and design of liquid antenna,” International Journal of RF and Microwave Computer-Aided Engineering, Feb. 2022. DOI: 10.1002/mmce.23101
- b. Shalabh Mishra, Dharmendra Upadhyay and Maneesha Gupta, "Approximation of Fractional-Order Butterworth Filter Using Pole-Placement in W-Plane," IEEE Transactions on Circuits and Systems II: Express Briefs, Vol. 68, Issue: 10, pp. 3229-3233, Oct. 2021. DOI: 10.1109/TCSII.2021.3074076

c. Mridul Gupta and Dharmendra Upadhyay, “Design and implementation of fractional-order microwave differentiator”, IET Microwaves, Antennas & Propagation. Vol. 12, Issue: 8, June 2018. DOI: 10.1049/iet-map.2017.0534

7. Bio-Sketch: Dr. Dharmendra Upadhyay is a Professor in the Department of Electronics and Communication Engineering, Netaji Subhas University of Technology, New Delhi, India. Prof. Upadhyay has guided 6 Ph.D. theses and 36 M. Tech. theses. He has published more than 80 research papers in reputed International Journals (41), Proceedings of International Conferences (42), and Book Chapters. He is a life member of ISTE. His research interests include Analog/Digital/Mixed Signal Processing and Antenna Designs.

4.7 Prof. Jyotsna Singh

1. Designation, Qualifications: Professor, Ph. D.
2. Areas of Interest: Signal and Image Processing
3. E-mail: jsingh.nsit@gmail.com
4. Phone: +91 9205475032
5. Home Page:
<https://sites.google.com/site/jyotsnasinghnsit/>



6. Selected Publications:
 - a. V. K. Pandey, J. Singh, H. Parthasarathy, “ Algebraic technique for computationally efficient Hahn moment invariants,” Multidimensional Systems and Signal Processing, October 2018, Volume 29, [Issue 4](#), pp 1529–1552.
 - b. Rohit Singh, Jyotsna Singh, Harish Parthasarathy , "Estimating the Angular Dynamics of a Fan Window Stroboscope from Noisy Quantum Image Measurements", Quantum Information Processing, 17(9), September 2018. DOI: [10.1007/s11128-018-2000-0](https://doi.org/10.1007/s11128-018-2000-0).
 - c. A. Chhabra, V. Vashishth, A. Khanna, D. K. Sharma, J. Singh, “ [An Energy Efficient Routing Protocol for Wireless Internet-of-Things Sensor Networks](#), Aug. 2018, arXiv preprint arXiv:1808.01039.

7. Bio-Sketch: Prof. Jyotsna Singh received her B. Tech degree in Electronics from Harcourt Butler Technological Institute, Kanpur, India in 1995 and M. Tech degree in Signal Processing from Netaji

Subhas Institute of Technology, Delhi University, Delhi, India, in 2001. She is working as faculty member in Netaji Subhas University of Technology, New Delhi, India for the last 17 years. She is senior member of IEEE and IETE. She has also been in the technical program committees of various international conferences such as SPIN, ICACCI, CCAIS etc. She has been teaching courses on Digital Signal Processing, Adaptive Signal Processing, Multimedia Security, Pattern Recognition and Electronics. She received her Ph.D degree in Electronics and Communication Engineering from the University of Delhi, India. . Her research interests include Speech/ Image processing and Multimedia Security.

4.8 Prof. Rajveer Singh Yaduvanshi

1. Designation, Qualifications: Professor, Ph.D.
2. Area of Interest: Optical Antennas, Nano Dra, Sensors, Iot, Absorbers, Filters Rf – Microwave, Dielectric Resonator Antennas
3. Phone: 9811962830
4. Email: yaduvanshirs007@gmail.com
5. Home Page:
https://www.researchgate.net/profile/Rajveer_Yaduvanshi3
6. Selected Publications:

- (a) Rajveer S. Yaduvanshi, Nishtha, “Conical dielectric resonator antenna for terahertz applications, Frequentz , Nov, 2020 (SCI).
- (b). G. Varshney, Shailza Gotra, V. S. Pandey and Rajveer S. Yaduvanshi, “Inverted Sigmoid Shaped Multiband Dielectric Resonator Antenna with Dual-Band Circular Polarization,” IEEE Transactions on Antennas and Propagation, vol. 66, no. 4, pp. 2067-2072, April, 2018 (SCI; IF: 4.13).(SCI)
- (c) Varshney, Gaurav, V. S. Pandey, R. S. Yaduvanshi, and Lalit Kumar. "Wide band circularly polarized dielectric resonator antenna with stair-shaped slot excitation." IEEE Transactions on Antennas and Propagation 65, no. 3 (2016): 1380-1383(SCI)

7 Bio Sketch: Books Published

1. Rajveer S. Yaduvanshi, H. Parthasarathy, “Magneto Hydro Dynamic Antenna (ISSN-978-81-8487-400-6)” 2015 Narosa



Publishing.

2. Rajveer S. Yaduvanshi, H. Parthasarathy, “Rectangular DRA Theory and Design (ISSN-978-81-322-2499-0)” SPRINGER International Publishing, 2015.
3. Rajveer S. Yaduvanshi, G. Varshney “Nano DRA for 5G applications”, Taylor and Francis (CRC) International Publishing 2020.

4.9 Dhananjay V. Gadre

1. Designation, Qualifications: Associate Professor, B.Sc., M.Sc, M.Engr(Computer Engineering)
2. Areas of Interest: Embedded Systems, Computer Architecture, Digital System Design, Instrumentation, Wearable Electronics, Internet Of Things
3. E-mail: dvgadre@gmail.com
4. Home Page: <http://www.nsit.ac.in/faculty/dvg/>
5. Bio-Sketch: Dhananjay V. Gadre completed his M.Engr. (Computer Engineering) from the University of Idaho, USA after his M.Sc. (Electronic Science) from the University of Delhi. Prof. Gadre teaches at the Netaji Subhas University of Technology (formerly Netaji Subhas Institute of Technology) in the Department of Electronics and Communication Engineering, currently as an Associate Professor.



At NSIT, he established the Centre for Electronics Design and Technology (CEDT) in 2003 where more than 5000 students received training in various aspects related to hands-on electronics and system design. In 2012, Texas Instruments Centre for Embedded Product Design (TI-CEPD) was started as a result of an MOU between Texas Instruments India and NSIT, under his direction. At TI-CEPD, he organized month long, hands-on “Internship Workshops on Embedded System Design” for undergraduate and postgraduate engineering and science students, PhD scholars and young faculty. Between June 2013 and July 2017, 12 such events were organized benefiting around 1000 participants.

Since January 2018, he has been nominated as an editor of IETE Journal of Education. Also in 2018, he received an invitation to be an adjunct faculty at IIT Jammu. In May 2020, his first MOOC (and

the first MOOC for NSUT) on ‘Introduction to Embedded System Design’ was launched on the NPTEL platform of the Swayam portal of Government of India. This course has been supported by Texas Instruments and is suitable for undergraduate and postgraduate students in science and engineering and it is also an AICTE approved FDP. In his professional career of more than 30 years, he taught at the SGTB Khalsa College, University of Delhi followed by a stint as a scientific officer at the Inter University Centre for Astronomy and Astrophysics (IUCAA), Pune, designing instrumentation for use in astronomy. He has lectured and demonstrated his work extensively across the length and breadth of India and five continents, including at the World Economic Forum at Davos in Switzerland on topics related to electronics and embedded systems.

Prof. Gadre is the author of several professional articles and six books. One of his books has been translated into Chinese and another one into Greek. His book “TinyAVR Microcontroller Projects for the Evil Genius”, published by McGraw Hill International (New York) consists of more than 30 hands-on projects and has been translated into Chinese and Russian. His latest book on TIVA ARM Cortex-M4 Microcontrollers is published by Springer Nature.

His professional interests include scientific instrumentation, digital systems design and computer architecture, embedded systems and Internet of Things. He has been a licensed radio amateur with a call sign VU2NOX since 1986.

4.10 Dr. Tarun Kumar Rawat

1. Designation, Qualifications: Assistant Professor, Ph.D.
2. Areas of Interest: Signal and Image Processing, Soft Computing Techniques, FPGA-based Implementation of DSP Systems, Wave Digital Filter.
3. E-mail: tarundsp@gmail.com, tarun@nsit.ac.in
4. Phone: 011-25000082
5. Home Page: <http://www.nsit.ac.in/faculty/tkr/>
6. Selected Publications:



a)Abhay Sharma, **Tarun Kumar Rawat**, “Design and FPGA Implementation of Lattice Wave Fractional Order Digital Differentiator”,

Microelectronics Journal (*Elsevier*), Vol. 88, 67-78, 2019,doi.org/10.1016/j.mejo.2019.04.013

b)Abhay Sharma, **Tarun Kumar Rawat**, Anjali Agrawal, “Design and FPGA implementation of lattice wave digital notch filter with minimal transient duration,” *IET Signal Processing*, Vol. 14, No. 7, pp. 440-447, 9 2020, doi: 10.1049/iet-spr.2020.0074.

c)Om Prakash Goswami, Dharmendra Kumar Upadhyay, **Tarun Kumar Rawat** “Extended Bilinear Transform and Multirate Technique based Approach for Analog-to-Digital Transform,” *International Journal of Electronics* (Taylor and Francis),2021<https://doi.org/10.1080/00207217.2021.1969446>.

7. Bio-Sketch: Dr. Rawat is currently an **Associate Professor** of Department of Electronics and Communication Engineering, Netaji Subhas University of Technology (formerly Netaji Subhas Institute of Technology), New Delhi. Dr. Rawat has guided 8 Ph.D. Theses and 35 M. Tech. theses. Dr. Rawat’s research focus is on modelling of circuits using stochastic differential equation, stochastic nonlinear filters, image processing, quantum signal processing and designing of digital systems, wave digital filters, differentiators, Hilbert transformers, microwave filters, fractional order systems using soft computing techniques. Recent thrusts have centered on FPGA implementation of DSP algorithms, and signal processing techniques for next generation wireless systems.

He has more than 50 international journal publications and more than 35 conference publications. Dr. Rawat has authored two books namely, ‘**Signals and Systems**’, and ‘**Digital Signal Processing**’ published by Oxford University Press (in 2010 and 2014, respectively).

4.11 Dr. Kunwar Singh

1. Designation, Qualifications: Assistant Professor, Ph.D.
2. Areas of Interest: Low power VLSI Design, CAD for VLSI, Applications of Artificial Intelligence techniques in performance optimization of CMOS circuits
3. E-mail: kunwar.singh@nsut.ac.in
4. Phone: 01125000091
5. Home Page: <http://www.nsit.ac.in/faculty/kws/>
6. Selected Publications:



- a. Gurjit Singh Walia, Kartik Aggarwal, Kuldeep Singh, **Kunwar Singh**, “Design and Analysis of Adaptive Graph based Cancelable Multi-biometrics Approach” IEEE Transactions on Dependable and Secure Computing, (Accepted for publication, May 2020) Doi: [10.1109/TDSC.2020.2997558](https://doi.org/10.1109/TDSC.2020.2997558)
 - b. **Kunwar Singh**, Satish Chandra Tiwari, Maneesha Gupta,” A Closed Loop ASIC Design Approach based on Logical Effort Theory and Artificial Neural Networks”, Integration, The VLSI Journal, Elsevier, [volume 69](#), pages 10-22, 2019.
 - c. **Kunwar Singh**, Aman Jain, Aviral Mittal, Vinay Yadav, Atul Anshuman Singh, Anmoll Kumar Jain, Maneesha Gupta, “Optimum transistor sizing of CMOS logic circuits using logical effort theory and evolutionary algorithms” Integration, The VLSI Journal, Elsevier, [volume 60](#), pages 25-38, 2018.
7. Bio-Sketch: Dr. Kunwar Singh received his B. Tech in Electronics and Communication Engineering from GGSIP University, New Delhi and M. Tech in VLSI Design from CDAC, Noida in 2006 and 2009 respectively. He was awarded PhD. degree from Department of Electronics & Communication Engineering, University of Delhi in 2016. He served as an intern in Cadence Design Systems during Feb. 2009 – Jul. 2009 where he worked as a product validation engineer in Silicon Package Board group. He is currently serving as an Assistant Professor in the Department of ECE, Netaji Subhas University of Technology (erstwhile NSIT) wef Sep. 2013. Earlier, he has also served as Assistant Professor in the Department of Electrical Engineering, Delhi Technological University from Jul. 2010 – Sep. 2013.

His research interests include low power high performance digital CMOS circuits, CAD for VLSI Design, applications of artificial intelligence techniques in power-delay-area product optimization of digital CMOS integrated circuits, automated design and optimization of analog and mixed-signal integrated circuits and integrated circuit design using memristors for neuromorphic computing. He has authored and co-authored more than 25 research papers in the above areas in various international/national journals and conferences. He also has one book chapter to his credit.

4.12 Dr. Bhawna Agarwal

1. Designation, Qualifications: Assistant Professor, Ph.D.
2. Areas of Interest: VLSI and Analog Signal processing
3. E-mail: kbhawnagarg@yahoo.co.in
4. Phone: 8010626959
5. Home Page: <http://www.nsit.ac.in/faculty/ba/>
6. Selected Publications:



- a. Bhawna Aggarwal and Abhishek Mittal, “Design of temperature and input voltage insensitive VDTA and impedance multiplier”, *Microelectronics Journal (Elsevier)*, vol. 85, pp. 34-51, 2019.
 - b. Niharika Narang, Bhawna Aggarwal and Maneesha Gupta, “DTMOS and FD-FVF Based Low Voltage High Performance VDTA and its Application in MISO Filter”, *Microelectronics Journal (Elsevier)*, vol. 63, pp. 66-74, May, 2017.
 - c. Bhawna Aggarwal, Maneesha Gupta, and Anil Kumar Gupta “A Comparative Study of Various Current Mirror Configurations: Topologies and Characteristics”, *Microelectronics Journal (Elsevier)*, vol. 53, pp. 134-155, July, 2016.
7. Bio-Sketch: Bhawna Aggarwal was born in 1980. She received her B.E. in Electronics & Communication Engineering from Indira Gandhi Institute of Technology, Delhi in 2002, M.E. in Electronics & Communication Engineering from Delhi College of Engineering, New Delhi in 2006. She received her Doctorate in 2016 from NIT Kurukshetra in the field of Analog and VLSI. Her area of research is Analog Integrated Circuits, Low power design techniques and designing of high-performance circuits. She worked as Assistant Professor for 11+ Years at Maharaja Agrasen Institute of Technology, Delhi and is currently working as Assistant Professor in Netaji Subhas University of Technology, Delhi. She is active member of IEEE, IETE and Vibha Societies. She acted as TPC member in various International Conferences and as panelist in National Conferences. She Published several research papers in SCI listed international journals of esteem and more than 20 research papers in international conferences. She has attended more than 20 workshops / seminars.

4.13 Dr. Shweta Gautam

1. Designation, Qualifications: Assistant Professor, Ph.D.
2. Areas of Interest: Analog Circuits Designing, Analog Signal Processing Control Theory, Power Electronics Systems & FPGA Controllers
3. E-mail: shwetauiet11@gmail.com
4. Phone: 01125000042,9205475031
5. Home Page: <http://www.nsit.ac.in/faculty/sg/>
6. Selected Publications:
 - a. Poipi, Shweta Gautam and Rajesh Gupta, “Unified Time-Domain Formulation of Switching Frequency for Hysteresis Current Controlled AC/DC and DC/AC Grid Connected Converters”, in *IET Power Electronics*, vol.6, no.4, pp. 683–692, April 2013.
 - b. Shweta Gautam and Rajesh Gupta, “Switching Frequency Derivation for Cascaded Multilevel Inverter Operating in Current Control Mode Using Multiband Hysteresis Modulation”, in *IEEE Transaction on Power Electronics*, vol. 29, no. 3, pp.1480-1489, March 2014.
 - c. Raveen Doon, Tarun Rawat, and Shweta Gautam, “Cifar-10 classification using deep convolutional neural network”, *IEEE PuneCon*, 30th November-2nd December 2018 at Symbiosis Institute of Technology, Pune, India.
7. Bio-Sketch: Shweta Gautam received the B.Tech. degree in Electronics and Communication Engineering from University Institute of Engineering and Technology (U.I.E.T.), India in year 2008, M. Tech. degree with specialization in Power Electronics & ASIC Design and Ph.D degree in Electrical Engineering from the Motilal Nehru National Institute of Technology, Allahabad, India in year 2010 and 2014 respectively. She worked at National Institute of Technology, Patna, India, as Assistant Professor from September 2013 to June 2014. Presently she is working as Assistant Professor in the department of Electronics and Communication at Netaji Subhas University of Technology, New Delhi, India.



4.14 Dr. Urvashi Bansal

1. Designation, Qualifications: Assistant Professor, Ph.D.
2. Areas of Interest: Analog signal processing and VLSI
3. E-mail: Urvashi.bansal@gmail.com
4. Phone: 01125000093



5. Home Page: <http://www.nsit.ac.in/faculty/ub/>
6. Selected Publications:
 - a. Urvashi Bansal, and Maneesha Gupta, "High bandwidth transimpedance amplifier using FGMOS for low voltage operation", Integration, the VLSI Journal (Volume 60 Issue C, January 2018, Pages 153-159).
 - b. Urvashi Bansal, and Maneesha Gupta. "Two stage class AB-AB amplifier using FGMOS for low voltage operation and SSF for frequency compensation." AEU-International Journal of Electronics and Communications ([Volume 73](#), March 2017, Pages 59-67).
 - c. Urvashi Bansal, Maneesha Gupta, and Urvashi Singh. "Frequency compensation of two stage CMOS circuit using negative capacitance and flipped voltage follower." Analog Integrated Circuits and Signal Processing (January 2017, Volume 90, [Issue 1](#), pp 175-188).
7. Bio-Sketch: Urvashi Bansal received B.E. in Electronics and Communication Engineering from JECRC, Rajasthan University, Jaipur in 2005, M.E. in Electronics and Communication Engineering from Delhi Engineering College, Delhi and did her Ph.D. from Delhi University in area of Analog Signal Processing. She has experience of around fourteen years of teaching in area of Analog electronics. She has many publications in reputed journals and conferences and she is an active member of few technical societies like IEEE, IETE and Vibha. Her research interests include frequency compensation techniques, low voltage low power techniques, CMOS circuits and image processing.

4.15 Shailesh Mishra

1. Designation, Qualifications: Assistant Professor, ME
2. Areas of Interest: Metamaterials, Antenna Design and Antenna Array.
3. E-mail: shaileshmishra@ieee.org
4. Phone: 011-25000088
5. Home Page: <http://www.nsit.ac.in/faculty/shm/>
6. Selected Publications:
 - a. Design and optimization of Patch Antenna for WLL-Cor-DECT Technology using IE3D Information Science and Technology, ISSN: 0976-917X & ISSN: 0976-9188 Vol. 1, Issue 2, 2010, PP-01-04.



7. Bio-Sketch: Shailesh Mishra is Assistant Professor in Electronics & Communication Engineering division of Netaji Subhas University of Technology (NSUT) New Delhi, affiliated to University of Delhi, India. He received the B.E. degree (with Honors) in Electronics & Communication Engineering from the University of Agra, India and M.E. degree (with Honors) from National Institute of Technical Teachers Training and Research (NITTTR), Chandigarh in Electronics & Communication Engineering. He is pursuing PhD in Microwave Engineering from the Indian School of Mines (ISM) Dhanbad. Mr. Mishra is a member of Institute of Electrical and Electronics Engineers (IEEE); life member of the Indian Society for Technical Education (ISTE) and Microwave Theory and Techniques (MTT) Society. He has organized workshop on “Future Trends in RF and Microwave Technologies” Sponsored by IEEE and MTT-s IIT, Delhi in 2010 and a Conference Indian Antenna Week (IAW) 2014. His areas of interest are Design, Optimization and Fabrication of RF & microwave components, Antenna wave propagation and Electromagnetic Field Theory. His current research interests include Metamaterials, Antenna Design and Antenna Array.

4.16 Dr. Satya P. Singh

1. Designation, Qualifications: Associate Professor, Ph.D.

2. Areas of Interest: Computer vision, Biomedical imaging, time-series data analysis, and solving healthcare problems using AI and Deep learning techniques.

3. E-mail: satya002u@gmail.com

4. Home Page:

5. Selected Publications:

a. Satya P. Singh, Lipo WANG, Sukrit Gupta, Parasuraman Padmanabhan, and BalázsGulyás (2020) “Shallow 3D CNN for Detecting Acute Brain Hemorrhage from Medical Imaging Sensors”. IEEE Sensors Journal.

b. Satya P. Singh, Aime Lay Ekuakille, Sukrit Gupta (2020) “Deep ConvLSTM with self-attention for human activity decoding using wearables”, IEEE Sensors Journal.



c. Justin Ker, Satya P. Singh, Lipo WANG (2019), "Image Thresholding Improves 3-Dimensional Convolutional Neural Networks Diagnosis of Different Acute Brain Hemorrhages on Computed Tomography Scan", *Sensors*, 19(9), 2167.

d. Aimé Lay-Ekuakille, Moise AvociUgwiri, John Peter DjunghaOkitadiowo, Vito Telesca, Pietro Picuno, Consolatina Liguori, Satya P. Singh (2020), "SAR sensors measurements for environmental classification: Machine learning-based performances". *IEEE Instrumentation & Measurement Magazine*, 23(6), pp. 23 - 30.

e. Satya P. Singh, Shabana Urooj (2016), "An improved CAD system for breast cancer diagnosis based on generalized pseudo-Zernike moment and Ada- DEWNN classifier", *Journal of Medical System*, 40(4), p.105.

f. Satya P Singh, and Shabana Urooj (2016), "Breast Cancer Detection using PCPCET and ADEWNN: A Geometric Invariant Approach to Medical X-rays Image Sensors". *IEEE Sensors Journal*, 16(12), pp.4847-4855.

6. Bio-Sketch: Dr. Singh holds a Doctoral Degree in Electrical Engineering with specialization in Artificial Intelligence and Medical Imaging, a Master Degree in Electronics Engineering from YMUST, Faridabad, India, and a Bachelor Degree in Electronics and Telecommunication Engineering from Institutions of Electronics and Telecommunication Engineers, New Delhi India.

Dr. Satya P. Singh is an Associate Professor in the Department of Electronics and Communication Engineering, Netaji Subhas University of Technology (NSUT) (formerly Netaji Subhas Institute of Technology), New Delhi. Before joining NSUT, Dr. Singh has worked as a Post-Doctoral Research Fellow (2018-2021) at Nanyang Technological University, Singapore, as an Assistant Professor (2011-2018) at Galgotias College of Engineering and Technology, India, and as an Assistant Professor (2009-2011) at Rawal Institute of Engineering and Technology, Faridabad, India.

His research area includes Biomedical imaging (DTI, MRI, fMRI, CT, ECG medical imaging modalities), and solving healthcare problems using AI and deep learning, Pattern recognition, Feature Extraction/Selection, Analysing Important Features Decoding, Learning Important Features, Classification, Segmentation. His research expertise includes Python

Libraries (Keras, TensorFlow, PyTorch, Scikit-learn, NumPy, Pandas, Scipy, Matplotlib, Seaborn, OpenCV) Programming skills (Python, MATLAB, C, Assembly, PLC-SCADA) OS (Linux, macOS, Windows), and Medical Images (CT scans, MRI, fMRI, DTI, X-rays) Medical Image Processing Software (SPM, FSL, DTK, MRtrix, MRICron, free surfer, Nipype, and ExploreDTI).

He is serving as an Associate Editor for Measurement (Elsevier), Measurement- Sensors (Elsevier) , Measurement - Food (Elsevier) Journals. He has published more than 60 research papers in reputed International Journals, Proceedings of International and National Conferences.

4.17 Dr. Sukhbir Singh

1. Designation, Qualifications: Assistant Professor, Ph.D.
2. Areas of Interest: Optical Communication Systems and Networking, Optoelectronics Devices, Nonlinear Fiber Optics.
3. E-mail: sukhbir.mrar@gmail.com
4. Phone: +91-9501853272
5. Home Page: --
6. Selected Publications:
 - a. Sukhbir Singh and Surinder Singh, "Limitations on Hybrid WDM/OTDM Multicast Overlay System Imposed by Nonlinear Polarization Effect and its Mitigation" IEEE Photonics Journal, vol. 9, no. 5, pp. 7204211, October 2017.
 - b. Sukhbir Singh, Surinder Singh, Q. M. Ngo, A. Malekmohammadi, "340-Gb/s PolSK-DP-DQPSK optical orthogonal modulation format with coherent direct detection for high capacity WDM optical network" Optical Fiber Technology, vol. 52, pp. 101936, 2019.
 - c. Sukhbir Singh and Surinder Singh, "Performance analysis of hybrid WDM-OTDM optical multicast overlay system employing 120 Gbps polarization and subcarrier multiplexed unicast signal with 40 Gbps multicast signal" Optics Communications, vol. 385, pp. 36-42, February 2017.
7. Bio-Sketch: Sukhbir Singh born in Dhuri, Punjab, India in 1990. He received the B. Tech degree in Electronics and Communication Engineering from Punjab Technical University, Jalandhar, in 2012 and M. Tech. degree in Electronics and Communication Engineering from Punjabi University, Patiala, in 2014. He has obtained his Ph.D. degree in



Electronics and Communication Engineering Department at Sant Longowal Institute of Engineering and Technology (Deemed to be University), Longowal, Sangrur, Punjab, India in September 2018. Previously, he was working as research fellow under ASEAN-India Collaborative R&D project from 2018 to 2021. Currently, he is Assistant Professor in the Department of Electronics and Communication Engineering, Netaji Subhas University of Technology, New Delhi. He has published more than 25 research papers in reputed International Journals, Proceedings of International and National Conferences. He is also associate member of Institution of Engineers of India (IEI), Kolkata. His research interests are in the areas of Optical Communication System and Networking, Nonlinear Optics and its applications, Optoelectronics Devices and Optical Sensing Devices

4.18 Dr. Neeraj Goel

1. Designation, Qualifications: Assistant Professor, Ph.D.
2. Areas of Interest: Nanoelectronics, Fabrication of electronic devices, Gas sensors, Photodetectors, 2D materials, Heterojunctions.
3. E-mail: neeraj.goel179@gmail.com
4. Phone: 9708117893
5. Home Page:
6. Selected Publications
 - a. Neeraj Goel, Rahul Kumar, MirabbosHojamberdiev, and Mahesh Kumar. "Enhanced carrier density in a MoS₂/Si heterojunction-based photodetector by inverse Auger process." IEEE Transactions on Electron Devices 99 (2018): 1-6.
 - b. Neeraj Goel, Rahul Kumar, Shubhendra Kumar Jain, Saravanan Rajamani, BasantaRoul, Govind Gupta, Mahesh Kumar, and S. B. Krupanidhi. "A high-performance hydrogen sensor based on a reverse-biased MoS₂/GaN heterojunction." Nanotechnology 30, no. 31 (2019): 314001.
 - c. Neeraj Goel, Jayanta Bera, Rahul Kumar, Satyajit Sahu, and Mahesh Kumar. "MoS₂-PVP nanocomposites decorated ZnO microsheets for efficient hydrogen detection." IEEE Sensors Journal 21, no. 7 (2021): 8878-8885.
7. Bio sketch: Dr. Neeraj Goel received his B. Tech. Degree in Electronics and Communication Engineering from Uttar Pradesh



Technical University, Lucknow, India in 2011, and M.Tech. Degree from IIT(ISM), Dhanbad, India, in 2015. He holds a Doctoral Degree in Nanoelectronics from IIT Jodhpur, Rajasthan, India, during 2015–2020. He worked as an Institute Postdoctoral Fellow at IIT Delhi from October 2020 to June 2021. Presently, he works as an Assistant Professor in the Department of Electronics and Communication at Netaji Subhas University of Technology (formerly NSIT), New Delhi. His current area of research is 2D materials, photodetectors, gas-sensors, and mixed dimensional heterojunctions.

He has published more than 15 papers in reputed International Journals and several national and international conferences. In 2018, his article was selected for the Emerging Leaders Award 2018 by Journal of Physics D: Applied Physics. He is also a reviewer of few International Journals.

4.19 Dr. Ritu Raj Singh

1. Designation, Qualifications: Assistant Professor, Ph.D

2. Areas of Interest:

Silicon Photonics: Optical waveguides with applications, Nonlinear optics, Optoelectronics device, Optical interconnects, Biomedical sensors, Silicon wire and its applications, crystals and gratings; Optical Networks: Fiber-optic networks, Free-space optical networks, FBG Based sensors, photonic crystal fiber, Fiber-waveguide coupler; Microwave Photonics: Photonic generation and processing of microwave signals, Radio-over-fiber systems, Unknown RF microwave frequency detection.

3. E-mail: riturajsingh@gmail.com

4. Phone Number: +91-9430766402, 6287821839

5. Home Page: <http://www.nsit.ac.in/division/ece/faculty/>

6. Selected List of Publications:

- Ritu Raj Singh, Saumya Kumari, Abhinav Gautam, Vishnu Priye, "Glucose Sensing Using Slot Waveguide Based SOI Ring Resonator", IEEE Journal of Selected Topics in Quantum Electronics, Volume: 25 (2018). DOI: 10.1109/JSTQE.2018.2879022
- Ritu Raj Singh, Vishnu Priye, "Silicon Nanowire Optical Rectangular Waveguide Biosensor for DNA Hybridization", IEEE Photonics Technology



Letters, Volume: 30, Page(s): 1123 – 1126 (2018). DOI: 10.1109/LPT.2018.2835152

- Ritu Raj Singh, Nishit Malviya, Vishnu Priye, “Parametric Analysis of Silicon Nanowire Optical Rectangular Waveguide Sensor”, IEEE Photonics Technology Letters, Volume: 28, Page(s): 2889 – 2892 (2016). DOI: 10.1109/LPT.2016.2624501

7. Bio-Sketch: Ritu Raj Singh is currently an Assistant Professor in the Department of Electronics and Communication Engineering at Netaji Subhas University of Technology Delhi. He received Ph.D and M. Tech. degree from Indian Institute of Technology (Indian School of Mines) Dhanbad, Jharkhand, India in 2019 and 2015, respectively. He received B.Tech. degree from Jaypee Institute of Information Technology, Noida, India in 2013. His research interests are Nanophotonics, Nonlinear Optics, Optical Sensors and Biosensors, Optics for Energy, Thin Films, Optical Metrology, Optical Communications, Optoelectronics, optical waveguide, silicon nanowire and its applications. He is a member of Optical Society of India (OSI), IEEE - Institute of Electrical and Electronics Engineers, SPIE - Society of Photo-Optical Instrumentation Engineers and OSA - The Optical Society.

4.20 Dr. Ankit Garg

1. Designation, Qualifications: Assistant Professor, Ph.D.
2. Areas of Interest: Wireless communications, multiple-input multiple-output (MIMO) communication systems, free space optical communications, space-time block codes, cooperative communication, physical layer security
3. E-mail: ankit.garg@nsut.ac.in
4. Phone: 9873125484.
5. Home Page: <http://www.nsut.ac.in/faculty/ag/>
6. Selected Publications:
 - a. A. Garg, M. R. Bhatnagar, O. Berder, and B. Vrigneau, “Performance Analysis of Erroneous Feedback-Based MIMO System Over Nakagami- m Fading Channels,” IEEE Trans. Commun., vol. 67, no. 8, pp. 5403-5418, Aug. 2019.
 - b. A. Garg, M. R. Bhatnagar, O. Berder, and B. Vrigneau, “Imperfect Quantized Feedback Based Beamforming for FSO MISO System over Gamma-Gamma Fading with Pointing Errors,” IEEE/OSA J. Opt. Commun. and Netw., vol. 9, no. 11, pp. 1005-1018, Nov. 2017.
 - c. A. Garg, H. K. Boddapati, and M. R. Bhatnagar, “Secrecy Performance



of Imperfect One-Bit-Feedback Based Alamouti MISO System," IEEE Commun. Lett., vol. 21, no. 99, pp. 2690-2693, Dec. 2017.

7. Bio-Sketch: Dr. Ankit Garg is an Assistant Professor in the Department of Electronics and Communication Engineering, Netaji Subhas University of Technology (formerly Netaji Subhas Institute of Technology), New Delhi. He has completed his Ph. D degree from Department of Electronics Engineering in the IIT Delhi in 2019 in the area of MIMO wireless communication. Dr. Garg is a Professional Member of Institute of Electrical and Electronics Engineers (IEEE) and Life Member of the Institute of Electronics and Telecommunication Engineers (IETE) (India).

4.21 Prof. Raj Senani

1. Designation, Qualifications: **Honorary Professor**, Ph.D.
2. Areas of Interest:
 - (a) Bipolar and CMOS Analog Integrated Circuits and Signal Processing
 - (b) Current-mode Analog VLSI Circuits
3. E-mail: senani@ieee.org, senani@nsut.ac.in
4. Home Page: <http://www.nsit.ac.in/faculty/rs>
5. Selected Publications:
 - a. R. Senani, A. K. Singh and V. K. Singh, 'A new floating current-controlled positive resistance using mixed-translinear cells' IEEE Transactions on Circuits and Systems II (USA), vol. 51, no. 7, pp. 374-377, 2004.
 - b. R. Senani, D. R. Bhaskar, S. S. Gupta and V. K. Singh, 'A configuration for realizing linear, voltage-controlled resistance, inductance and FDNC elements', International Journal of Circuit Theory and Applications (UK), vol. 37, no. 5, pp. 709-719, June 2009.
 - c. R. Senani, D. R. Bhaskar, S. S. Gupta and B. Singh: 'Rebuttal to Fully-uncoupled frequency of oscillation and condition of oscillation: A caution', Archiv. Fur Electronics und Ubertragungstech (Germany), vol. 81, No. 11, pp. 120-131, November 2017.



6. Bio-Sketch: Raj Senani was born in 1950 at Budaun. He obtained B.Sc. in 1966 from Lucknow University, B.Sc. (Engineering) in 1971 from HBTI, Kanpur, M.E. (Electrical Engineering) with Honours in 1974 from MNREC (now MNNIT), Allahabad and Ph.D. in Electrical Engineering in 1988, from University of Allahabad. Dr. Senani held the positions of Lecturer (1975-1986), Reader (1987-1988) at the EE Department of MNREC, Allahabad. He joined the ECE Department of the Delhi Institute of Technology, Delhi (now Netaji Subhas University of Technology) in 1988 as an Assistant Professor and became a Full Professor in 1990.

Since 1990, he has served as Head of the ECE Department for well over two decades and for several other Departments from time to time. He has been Dean Research (1993-1996), Dean Academic (1996-1997), Dean Administration (1997-1999), Dean Post Graduate Studies (1997-2001) and Director of DIT/NSIT during 1996-1997 and 2003-2004. He served as Dean, Faculty of Technology, Delhi University during 2011-2014 and as regular Director of NSIT during 2008-2014.

Professor Senani has authored/co-authored over 150 research papers- all published in refereed international journals, receiving, as per Google Scholar, over 5500 citations with an h-index of 42 and i-10 index of over 125 so far. He has also written 05 book chapters and 05 research monographs during 2013-2020 (seven of these published by Springer, US; one by IET, UK).

He has been working as an Editorial reviewer for over 35 international journals and has been ranked among the Top 1% Reviewers of the World for Engineering and Interdisciplinary areas, for three years consecutively (2017, 2018 and 2019) by Publons (Web of Science Group). He served as Editor-in-Chief for IETE Journal of Education during 2012-2017 and has been continuing as an Associate Editor for the journal-Circuits, Systems and Signal Processing (USA), since 2003.

Professor Senani is a Member of Sigma Xi (USA), Senior Member of IEEE (USA), Fellow of IE (India), Life Fellow of IETE (India), an elected (2008) Fellow of the National Academy of Sciences, India (NASI), the recipient of the Second Laureate of the 25th Khwarizmi International Award for 2012.

Professor Senani is listed in Marquis' Who's Who (USA) and several other biographical directories, since 1990.

4.22. Prof. B. P. Singh

1. Designation, Qualifications: **Adjunct Professor**, Ph.D.
2. Areas of Interest: VLSI
3. E-mail: bpsinghgkp@gmail.com
4. Phone: 8619209911
5. Home Page: <http://www.nsit.ac.in/faculty/bsp/>



6. Selected Publications:

- a. Bansal D., Nagar B.C., **Singh B. P.**, Kumar A., “Improved Domino Logic circuits and its Application in Wide fan-in OR Gates”, *Micro & Nanosystems*, vol. 12, no. 1, Jan. 2020, pp. 58-67, ISSN No. 1876-4029.
- b. Bansal D., Nagar B.C., **Singh B. P.**, and Kumar A., “Low power wide fan-in domino OR gate using CN-MOSFETs”, *International Journal of Sensors, Wireless Communications and Control*, vol. 9, no. 1, Feb. 2019, pp. 1-8.
- c. Bansal D., **Singh B. P.**, Kumar A., “Efficient Keeper or Pseudo Domino Logic”, *International Journal of Pure and Applied Mathematics*, vol. 117, no. 16, Dec. 2017, pp. 605-612, ISSN No. 1311-8080.

7. Bio-Sketch: Dr. B. P. Singh, IEEE (LSM-90394908), IETE (LM-43152), IE (LM-8252), ISTE (LM-1631), Ph.D. in 1980, M.Sc. (Engg.) in 1970, B. Sc. (Engg.) in 1967 all degrees in the field of Electronics and Communication Engg. from Ranchi University, Ranchi. He worked as Professor in Deptt. of E & CE, Manipal University Jaipur 1st August, 2014 to 15th May 2017, Professor, Deptt. of ECE, Mody Institute of Technology and Science, Lakshmangarh from July 2009 to June 2013, Professor, National Institute of Technology, Silchar (Assam) from 1st July 1985 to 19th Sept. 1987 (on EOL from Indian School of Mines, Dhanbad), Professor, Madan Mohan Technological University, Gorakhpur from 21st Sept. 1987 to 30th June 2009, AP, Indian Institute of Technology Indian School of Mines Dhanbad from 7th May 1981 to 20th Sep. 1987, Assistant Professor, Birla Institute of Technology Mesra, Ranchi (Deemed University) from 20th Nov. 1969 to 6th May 1981. Recently he joined as Professor Adjunct, Netaji Subhas University of Technology, New Delhi, 01 Jan 2020 till date. He passed Amateur Radio W/T License examination conducted by Govt. of India, Ministry of Communication in 1989.

He served as reviewer for The Institution of Electrical & Electronics Engineers (India), The Institution of Engineers (India), ET Division, The Journal of Indian Journal of Pure & Applied Physics, CSIR, (India), MICRO, Springer New York, Journal of Signal Processing Systems, Springer New York, VLSI Signal Processing Systems, Springer New York.

Professor Singh has authored/co-authored over 150 research papers in refereed journals, International Conference and National Conferences.

4.23 Prof. S. L. Maskara



1. Designation, Qualifications: Honorary Professor, Ph.D.
2. Areas of Interest: Communication
3. E-mail:maskara.shankar@gmail.com
4. Phone: 9163030691
5. Home Page:

http://www.nsut.ac.in/divisions/ece/dept_ece_honoraryfaculty/

6. Selected Publications:

- a. S. L. Maskara, "An active RC Delay Line for Matched Filter Correlators", IEEE Trans. on Communications, Vol,Com. 25, No. 8, 1977
- b. Marichamy, S.Chakrabarti&S.L.Maskara "Overview of Hand-off Schemes in Cellular Mobile Networks and their comparative Performance Evaluation",; Proc.of the IEEE Vehicular Tech. Conf.(50th) VTC-99 Fall, Amsterdam, 19-22 Sept.1999, pp.1486-1490..
- c. Shankar LallMaskara, "Evaluation of Correlation Properties of Orthogonal Spreading Codes for CDMA Wireless Mobile Communication", 2010 IEEE 2nd International Advance Computing Conference (IACC), March 2010.

7. Bio-Sketch:

Prof S. L. Maskara received his Master degree from IISc Bangalore and Ph.D. from IIT Kharagpur in 1966 and 1977 respectively. He started his career as AssistantProfessor/ Lecturer in theTelecommunication Engineering Department at Bihar Institute of Technology, Sindri, Jharkhand. From 1966 to 2004 he served at different faculty positions (i.e., Lecturer /Assistant Professor/ Professor) in the Electronics and Electrical Communication Engineering Department of the Indian Institute of Technology, Kharagpur. From 2004-05, he worked as **Distinguished Professor** at Dhirubhai Ambani Institute of Information and Communication Technology, Gandhinagar, Gujarat. Between 2005-06 he served as Distinguished **Professor** at L. N. Mittal Institute of Information Technology, Jaipur. He was **Dean of Academics & Research** at Jaypee Institute of Information Technology, Noida from 2006-11. He has been closely associated with many sponsored and consultancy research projects many of which has been successfully completed. His research interest includes spread spectrum, error control coding, digital satellite and optical fiber communication, Telecommunication switching and networking.

He has been actively engaged in consultancy and sponsored research work from Department of Electronics, Defense Research and Development Organization, Ministry of HRD, ISRO, BEL Ghaziabad, ECIL Hyderabad. Most of these projects where I have been either a co-investigator or chief investigator have been successfully completed. Some of the projects completed are as follows:

- (1) Adaptive Delta Modulation (DRDO)
- (2) Low bit rate speech coding (DRDO)
- (3) Fibre Optic Communication (DRDO)
- (4) Digital Communication (ISRO)
- (5) Spread Spectrum Techniques (DRDO)
- (6) Telematics (MHRD)
- (7) Education and Research in Computer Network (DOE)
- (8) Fibre Optics Application (DOE)

Awards

- i.** K. S. Krishnan Memorial award (1981) of the IETE for the Paper “ Codes and Tracking Receiver for an Experimental Spread Spectrum Multiple Access System “, JIETE, Vol. 27, No. 8, 1981, pp. 265-270.
- ii.** Third Prof K. Sreenivasan Memorial award for outstanding contribution in teaching Electronics and Telecommunication Engg. in the broadest sense during the last 10 years, IETE, 1994-95.
- iii.** VSNL Chair Professor, IIT Kharagpur, (1996 - 97)
- iv.** Distinguished Alumnus Award of B.I.T Sindri on the occasion of its Golden Jubilee, 1999.
- v.** K. S. Krishnan Memorial award (2001 - 02) of the IETE for the Paper “ An Overview of Congestion Control Techniques in ATM Networks and Some Performance Results”, IETE Technical Review, Vol. 17, No.3, May-June 2000, pp 87-103.

4.24 Prof. Surendra Prasad

1. Designation, Qualifications: Honorary Professor, Ph.D.
2. Areas of Interest: Signal Processing and Communication
3. E-mail: sprasad@ee.iitd.ac.in
4. Phone: +91 11 2659 1115
5. Home Page:

http://www.nsut.ac.in/divisions/ece/dept_ece_honoraryfaculty/

6. Selected Publications:



- a. S. M. Zafaruddin ; Surendra Prasad, “GMRES Algorithm for Large-Scale Vectoring in DSL Systems”, IEEE Signal Processing Letters, Volume: 25, Issue: 8 , 2018
- b. Ramanjit Ahuja, PraveshBiyani and Surendra Prasad, “Low Complexity Training Methods for Common Mode Aided Cancellation of Intermittent Alien Noise in Downstream VDSL”, IEEE Transactions on Communications, Volume: 66, Issue: 1, 2018
- c. Ramanjit Ahuja, PraveshBiyani and Surendra Prasad, “On low complexity per-tone common mode sensor based alien noise cancellation for downstream VDSL”, 2017 IEEE International Conference on Communications (ICC), 2017

7. Bio-Sketch:

Dr. Surendra Prasad received his B. Tech (Hons) in Electronics and Electrical Communication Engineering from IIT Kharagpur in 1969, and the M. Tech (1971) and Ph. D (1974) degrees in Communication Engineering from IIT Delhi. He joined the Institute as a faculty member in 1971, and has since served in many capacities. Although he has held several administrative positions like the Dean, Undergraduate Studies (1999-2002), Deputy Director (Faculty) (2002-2005), and eventually serving as the Director (2005-2011), at heart he is a committed teacher and researcher.

Prof Prasad’s research spanning a period of more than 40 years is concerned with the development of new techniques and algorithms for signal processing; several of these are of fundamental importance and have been extensively cited in literature including text books and reference works. He has also attempted to make some contributions to indigenous R&D efforts, in the form of undertaking technologically advanced projects in sonar and seismic signal processing, array processing, speech processing and digital communications. In the nineties, Dr. Prasad led a team in developing a high speed, state-of-the-art modem for digital communications over the HF Channel, which has a strategic and commercial importance. The Technology for this and several other products developed by him and his students/associates have been transferred to Indian Industry.

As a leader and member of the Joint Telematics Group of the IIT's and IISc Bangalore, Dr. Prasad has been involved with the up-gradation of technical and teacher-manpower in the area of telecommunications in the country through a range of capacity building activities. Dr. Prasad was deeply involved in the process of establishment of the Bharti School of Telecom Technology

and Management, through co-operation with Bharti enterprises, and the Bharti Foundation, and has served as a Co-ordinator of this School.

As Director of the Institute, he took several major academic initiatives. Dr. Prasad has also helped his students set up their own businesses/ companies with a view to encourage entrepreneurship.

Dr. Prasad is the recipient of the **Vikram Sarabhai Research Award** in Electronics and Telecommunications for the year 1987, the **Shanti Swarup Bhatnagar Prize** for Engineering Sciences for 1988, and the **Om Prakash Bhasin Prize** for research in Electronics and Communications for 1994. He is a **Fellow** of the **Indian National Academy of Engineering**, the **Indian National Science Academy**, the **Indian Academy of Sciences** and the **National Academy of Science**. He has been conferred the **Honorary Degree of Doctor of Technology** by **Loughborough University, UK**, in recognition of his outstanding contributions in communications research. He has also been awarded the prestigious **J.C. Bose Fellowship** of DST and the **meritorious RAJKUMAR VARSHNEY Award in “Systems Theory” of Systems Society of India** for the year 2007. He was honoured as a **Distinguished Alumnus of IIT Kharagpur** in 2007. He received the **Vasvik Award** for 2006, and the **Life Time Achievement Award of the System Society of India**. He has served on many Committees of MHRD, the Planning Commission, AICTE, DRDO, CSIR, among others, and has been a member of the Board of Governors of several IIT's NIT's and other educational institutions and a member of the Governing Body of CSIR and CSIR Society, Govt. of India, and on the Board of Directors of EdCIL among others. He has been the Honorary Chairman of the National Board of Accreditation (NBA) for more than five year and successfully led the effort to get NBA admitted as a full signatory of the Washington Accord. He has also contributed deeply to the development of the performance metrics for the National Institutional Ranking Framework (NIRF) of MHRD, and steering the rankings effort for the first three years.

Dr. Prasad is proud of having worked with a number of outstanding students and colleagues at all levels over his long career at IIT Delhi. He feels that they have contributed immensely to his learning, and enriched his thinking. Most of his students have risen to top positions in academia, industry and Government and have distinguished themselves in their spheres of activity.

5. Laboratory Infrastructure

Each state-of-the-art laboratory is managed by a Faculty-In-Charge and a staff-in-charge and has the best-of-breed equipments featuring Spectrum Analyzers, Vector Network Analyzers, Dynamic Signal Analyzer, Microwave Benches, MATLAB, DSP, PSPICE, IE3D etc.

5.1 Analog Signal Processing Research Lab: Analog Signal Processing Research Lab has the infrastructure for carrying out advanced research work in the broad areas of Analog Integrated Circuits and Signal Processing. The Lab has been a center of active research activities in the areas of Bipolar and CMOS Analog Integrated Circuits and Signal Processing, Current Mode Circuits and Techniques, Chaotic Nonlinear Dynamical Circuits and Translinear/Log-domain Circuits.

5.2 Microwave Lab: The focus of the Microwave Engineering Laboratory at Division of Electronics and Communication Engineering, NSIT Delhi has been the development and use for scientific studies of microwave frequencies. Our major areas of research involve the designing of microwave filters and antennas for different signal processing applications.

5.3 Digital Electronics Lab: This lab pertains to UG/PG students for experiments related to digital hardware kits. The lab is well equipped with digital trainer kits, digital storage oscilloscopes, function generators, and integrated circuit testers which are used by students to perform hardware experiments related to digital electronics.

5.4 Digital Integrated Circuits Simulation Lab: This lab pertains to UG/PG students for experiments related to simulation of digital integrated circuits. Experiments related to courses including hardware description languages (VHDL/Verilog) are performed in the lab.

5.5 PCB and Project Lab: The lab helps students both UG & PG for carrying out their project works.

5.6 TI-CEPD: Texas Instruments Centre for Embedded Product Design (TI-CEPD) was started in 2012 as a result of an MOU between Texas Instruments India and NSIT. At TI-CEPD, month long, hands-on “Internship Workshops on Embedded System Design” for undergraduate and postgraduate engineering and science students, PhD scholars and young faculty are very frequently organized. Between June 2013 and July 2017, 12 such events were organized benefiting around 1000 participants.

5.7 CEDT: The Centre for Electronic Design and Technology (CEDT) is accessible to students of all branches in NSUT. This is an open access lab, where the students work on interesting projects and mentor others

- 5.8 Wireless Communication Research Lab:** The research fellows working in the area of wireless communication carry their research in the lab. The output of the lab is in terms of numerous research papers published in reputed journals.
- 5.9 Digital and Optical Communication Lab:** The lab was set up to cater to the experiments needed in the subject entitled "Optical Fibers" (EC-413) an elective taught in VIIth semester ECE students and Optical data processing (SP-515) an elective taught to M.Tech students. At present the lab is equipped with three Fiber optic trainer kits, three numbers of function generator, Digital storage oscilloscope and ten user academic license network version OptSim simulator.
- 5.10 Telemetry and Computer Communication Lab:** The Telemetry and Computer communication (TCC) Lab has been established to provide Internet access and general computing facility to the students of the department and also to provide lab support for the theory course entitled "Computer communication and Electronic Switching" taught to final year BE (ECE) students in VIII semester. At present the lab is equipped with 24 PCs, a server, Five sets of LAN trainer kits, 50 users network version MATLAB software.
- 5.11 Optical Communication Research Lab:** Optical networks are rapidly emerging due to the enormous bandwidth provided by the optical medium. Keeping in pace with the rapid development in technology, courses like Optical fiber and Computer Communication are being taught in the final year at the U.G. Level and Optical data processing at the P.G. level. The lab is being built to provide research facilities to the P.G. students. The lab is equipped with OptSim simulator, Optiwave simulator and PCs. The facilities in the lab has been created from the grant received by AICTE under RPS scheme.
- 5.12 Digital Signal Processing Lab:** Digital Signal Processing Lab has the infrastructure for carrying out UG and PG experiments in the areas of Signal Processing and Image Processing. Lab also has been a center of active research activities in the areas of Digital Signal Processing, Image Processing and Optimization techniques. So far, more than 50 research papers have been published in reputed international journals. The facilities include: TMS 320 C6713 Digital Signal Processors, ADSP-2100 based systems, Spectrum Analyzer, Arbitrary waveform generator, MATLAB software, Digital oscilloscope upto 1 GHz, In Circuit Emulators (ICE) for ADSP chips, Multimedia workstations for image processing. Besides this, the lab also has a number of PCs connected to the Lab network as well as Institute network for working with MATLAB.

- 5.13 Circuit Simulation Lab:** Circuit Simulation Lab deals with activities related to SPICE simulation of Electronic Circuits. It has the infrastructure for carrying out UG and PG experiments in the areas of Analog Integrated Circuits and Signal Processing.
- 5.14 Analog Integrated Circuits I/II Lab:** AIC Lab contains facilities to conduct experimental work related to Bipolar and MOS Analog Integrated Circuits. It has the infrastructure for carrying out UG and PG experiments in the areas of Linear Integrated Circuits and BiMOS AICs.
- 5.15 Electronics Lab I/II:** Electronics Laboratory (I, II) engages undergraduate students of 3rd and 4th semester of all divisions of NSIT. Students are encouraged to perform basic experiments related to diodes, transistors and op-amps which aids in understanding of the circuit behavior at component level. The experiments range from realization of clippers, clampers, voltage regulators as applications of diodes to implementation of amplifiers, filters and oscillators of various types using BJTs, MOSFETs and op-amps. **Facilities available :**The lab is equipped with all the modern electronic testing, measuring and other equipments like TDS series Digital real time Oscilloscope (DSO), AFG 3000 series Digital Arbitrary Function Generators, Dual DC power supply, Digital Multimeters, UPS (10 KVA), Digital & Analog IC Tester and Bread Board etc.
- 5.16 Advanced Electronics Lab:** Advanced Electronics Laboratory has been setup specifically for UG/PG students and research scholars for conducting research in the domain of low power, low voltage and high performance design of integrated circuits and systems. In Advanced Electronics Laboratory & Electronics Research Laboratory, various simulation software are available such as ORCAD Circuit Simulator, Software (RHEL, ESV4), EDA software Mentor Graphics (25 User), EDA software Tanner Tools PRO (5 User), HP Desktop PCs and laser Jet Printer, UPS (5 KVA) etc.
- 5.17 Electronics Research Laboratory:** This laboratory has been setup specifically for UG/PG students and research scholars for conducting research in the domain of low power, low voltage and high performance design of integrated circuits and systems.
- 5.18 VLSI Design Lab:** VLSI Design Laboratory has been setup in order to facilitate PG students and research scholars (TRFs) to conduct cutting edge research in the field of analog and mixed-signal integrated circuit design, SoC design and emerging technologies in the VLSI domain.
- 5.19 Advanced Communication Lab:** The Communication/Advanced Communication Labs cater to the laboratory courses related to the

communication courses of all the divisions of NSIT. The Lab curriculum has been designed so that students are able to gain hands-on experience using modern testing equipment, technology and MATLAB software. The objective of these lab. courses is to learn how to generate and process analog and digital communication signals using signal processing algorithms in Matlab and the trainers boards, which use a unique block diagram approach for building experiments.. Observe and interpret the impact of channel impairments such as noise, power limitation and finite bandwidth on different communication

5.20 Communication and Signal Processing Research Lab: This Lab was setup using a grant obtained from AICTE under the MODROBS scheme. The Communication and Signal Processing Research Lab undertakes research in the are of wireless communication and signal processing techniques for communication.

5.21 Advanced Computation Lab: This Lab was setup with the aim to create a general computing facility mainly for PG/Research students and faculty. The laboratory is open to all PG/Research students and faculty throughout the day. PG/Research students are encouraged to use the lab to perfect their computing skills whenever they have time to spare.

5.22 Multimedia Research Lab: Division of ECE was developed by faculty incharge Prof. Jyotsna Singh under the Research Project Scheme (RPS) of AICTE. The lab is proposed to have all state of art facilities in Audio, Image, Video, Graphics and text data. The main objective of MRL is to encourage research in new emerging areas such as multimedia security, image and audio processing, pattern recognition etc. The lab also offers facilities for the courses adaptive signal processing, pattern recognition, speech processing and image processing to the U.G/ P.G students. Various publications in international conferences and journals are published by the research scholars working in the lab.

5.23 Microprocessor Laboratory: The lab is well equipped with trainer kits pertaining to 8085 microprocessor.

6. ELIGIBILITY WITH RESPECT TO BACHELORS & MASTERS DEGREE.

List of Degrees in B. Tech. / B.E./B.Sc. Engg. considered for admission

1. Electronics Engineering,
2. Electronics and Communication Engineering,
3. Electronics and Telecommunication Engineering and
4. Electronics and Instrumentation Engineering
5. Electronics and Electrical Engineering

With M. Tech. specialization in any of the branches mentioned below.

1. Communication and Networking,
2. Communication and Signal Processing,
3. Communication Engineering,
4. Communication Engineering and Signal Processing,
5. Communication Networks,
6. Digital Communication,
7. Digital Communication Engineering
8. Digital Communications and Networking,
9. Digital Electronics,
10. Digital Electronics and Communication,
11. Digital Electronics and Communication Engineering,
12. Digital Electronics and Communication Systems,
13. Digital Electronics Engineering,
14. Digital Image Processing,
15. Digital Signal Processing
16. Electronics and Communication (Communication System Engineering)
17. Electronics and Communication (Signal Processing and Communication)
18. Electronics and Communication (Signal Processing and VLSI Technology)
19. Electronics and Communication (VLSI Design)
20. Electronics and Communication (VLSI System Design)
21. Electronics and Communication (Wireless Communication Systems and Networks)
22. Electronics and Communication (Wireless Communication Technology)
23. Electronics and Communication Engineering
24. Electronics and Tele-Communication Engineering
25. Electronics and Telecommunication Engineering (Radio and System)
26. Electronics and Telecommunication Engineering (Technologist/Electronic Radio)
27. Electronics and Telecommunications Engineering
28. Electronics Design and Technology
29. Electronics Design Technology
30. Electronics Engineering
31. Electronics Product Design and Technology

32. Electronics Systems and Communication
33. Electronics Technology
34. Electronics Tele Communication
35. Embedded and Real Time Systems
36. Embedded Control Systems
37. Embedded System and Computing
38. Embedded System and VLSI
39. Embedded System and VLSI Design
40. Embedded Systems
41. Embedded Systems Technologies

7. SYLLABUS FOR WRITTEN TEST.

The entrance test shall consist of 100 multiple choice questions. There shall be no negative marking. 50 questions shall be based on Research Aptitude/Methodology which shall include quantitative methods/computer applications, experimental techniques etc. and 50 questions shall be subject specific. The test shall be of TWO hours.

The syllabus for the entrance test is as follows:

Part A Research Aptitude/Methodology: Common to all departments

Unit-1 Research Aptitude

- Research: Meaning, Types, and Characteristics, Positivism and Post-positivist approach to research.
- Methods of Research: Experimental, Descriptive, Historical, Qualitative and Quantitative methods.
- Steps of Research.
- Thesis and Article writing: Format and styles of referencing.
- Application of ICT in research.
- Research ethics.

Unit-2 Comprehension & Communication

- A passage of text be given. Questions be asked from the passage to be answered.
- Communication: Meaning, types and characteristics of communication.
- Effective communication: Verbal and Non-verbal, Inter-Cultural and group communications, Classroom communication.
- Barriers to effective communication.

- Mass-Media and Society.

Unit-3 Mathematical Reasoning and Aptitude

- Types of reasoning.
- Number series, Letter series, Codes and Relationships.
- Mathematical Aptitude (Fraction, Time & Distance, Ratio, Proportion and Percentage, Profit and Loss, Interest and Discounting, Averages etc.) Unit-VI Logical Reasoning
- Understanding the structure of arguments: argument forms, structure of categorical propositions, Mood and Figure, Formal and Informal fallacies, Uses of language, Connotations and denotations of terms, Classical square of opposition.
- Evaluating and distinguishing deductive and inductive reasoning.
- Analogies.
- Venn diagram: Simple and multiple use for establishing validity of arguments.

Unit-4 Data Interpretation

- Sources, acquisition and classification of Data.
- Quantitative and Qualitative Data.
- Graphical representation (Bar-chart, Histograms, Pie-chart, Table-chart and Line-chart) and mapping of Data.
- Data Interpretation.
- Data and Governance.

Unit-5 Information and Communication Technology (ICT)

- ICT: General abbreviations and terminology.
- Basics of Internet, Intranet, E-mail, Audio and Video-conferencing.
- Digital initiatives in higher education.
- ICT and Governance.

NOTE: (i) Equal number of questions are to be set from each Unit.

(ii) Whenever graphical/pictorial question(s) are set for sighted candidates, a passage followed by equal number of questions and weightage be set for visually impaired candidates.

Part B: Department Specific Subject:

Unit 1: Engineering Mathematics

Linear Algebra: Vector space, basis, linear dependence and independence, matrix algebra, eigenvalues and eigenvectors, rank, solution of linear equations – existence and uniqueness.

Calculus: Mean value theorems, theorems of integral calculus, evaluation of definite and improper integrals, partial derivatives, maxima and minima, multiple integrals, line, surface and volume integrals, Taylor series.

Differential Equations: First order equations (linear and nonlinear), higher order linear differential equations, Cauchy's and Euler's equations, methods of solution using variation of parameters, complementary function and particular integral, partial differential equations, variable separable method, initial and boundary value problems.

Vector Analysis: Vectors in plane and space, vector operations, gradient, divergence and curl, Gauss's, Green's and Stoke's theorems.

Complex Analysis: Analytic functions, Cauchy's integral theorem, Cauchy's integral formula; Taylor's and Laurent's series, residue theorem.

Numerical Methods: Solution of nonlinear equations, single and multi-step methods for differential equations, convergence criteria.

Probability and Statistics: Mean, median, mode and standard deviation; combinatorial probability, probability distribution functions - binomial, Poisson, exponential and normal; Joint and conditional probability; Correlation and regression analysis.

Unit 2: Networks, Signals and Systems

Network solution methods: nodal and mesh analysis; Network theorems: superposition, Thevenin and Norton's, maximum power transfer; Wye-Delta transformation; Steady state sinusoidal analysis using phasors; Time domain analysis of simple linear circuits; Solution of network equations using Laplace transform; Frequency domain analysis of RLC circuits; Linear 2-port network parameters: driving point and transfer functions; State equations for networks.

Continuous-time signals: Fourier series and Fourier transform representations, sampling theorem and applications; Discrete-time signals: discrete-time Fourier transform (DTFT), DFT, FFT, Z-transform, interpolation of discrete-time signals; LTI systems: definition and properties, causality, stability, impulse response, convolution, poles and zeros, parallel and cascade structure, frequency response, group delay, phase delay, digital filter design techniques.

Unit 3: Electronic Devices

Energy bands in intrinsic and extrinsic silicon; Carrier transport: diffusion current, drift current, mobility and resistivity; Generation and recombination of carriers; Poisson and continuity equations; P-N junction, Zener diode, BJT, MOS capacitor, MOSFET, LED, photo diode and solar cell; Integrated circuit fabrication process: oxidation, diffusion, ion implantation, photolithography and twin-tub CMOS process.

Unit 4: Analog Circuits

Small signal equivalent circuits of diodes, BJTs and MOSFETs; Simple diode circuits: clipping, clamping and rectifiers; Single-stage BJT and MOSFET amplifiers: biasing, bias stability, mid-frequency small signal analysis and frequency response; BJT and MOSFET amplifiers: multi-stage, differential, feedback, power and operational; Simple op-amp circuits; Active filters; Sinusoidal oscillators: criterion for oscillation, single-transistor and op-amp configurations; Function generators, wave-shaping circuits and 555 timers; Voltage reference circuits; Power supplies: ripple removal and regulation.

Unit 5: Digital Circuits

Number systems; Combinatorial circuits: Boolean algebra, minimization of functions using Boolean identities and Karnaugh map, logic gates and their static CMOS implementations, arithmetic circuits, code converters, multiplexers, decoders and PLAs; Sequential circuits: latches and flip-flops, counters, shift-registers and finite state machines; Data converters: sample and hold circuits, ADCs and DACs; Semiconductor memories: ROM, SRAM, DRAM; 8-bit microprocessor (8085): architecture, programming, memory and I/O interfacing.

Unit 6: Control Systems

Basic control system components; Feedback principle; Transfer function; Block diagram representation; Signal flow graph; Transient and steady-state analysis of LTI systems; Frequency response; Routh-Hurwitz and Nyquist stability criteria; Bode and root-locus plots; Lag, lead and lag-lead compensation; State variable model and solution of state equation of LTI systems.

Unit 7: Communications

Random processes: autocorrelation and power spectral density, properties of white noise, filtering of random signals through LTI systems; Analog communications: amplitude modulation and demodulation, angle modulation and demodulation, spectra of AM and FM, superheterodyne

receivers, circuits for analog communications; Information theory: entropy, mutual information and channel capacity theorem; Digital communications: PCM, DPCM, digital modulation schemes, amplitude, phase and frequency shift keying (ASK, PSK, FSK), QAM, MAP and ML decoding, matched filter receiver, calculation of bandwidth, SNR and BER for digital modulation; Fundamentals of error correction, Hamming codes; Timing and frequency synchronization, inter-symbol interference and its mitigation; Basics of TDMA, FDMA and CDMA.

Unit 8: Electromagnetics

Electrostatics; Maxwell's equations: differential and integral forms and their interpretation, boundary conditions, wave equation, Poynting vector; Plane waves and properties: reflection and refraction, polarization, phase and group velocity, propagation through various media, skin depth; Transmission lines: equations, characteristic impedance, impedance matching, impedance transformation, S-parameters, Smith chart; Waveguides: modes, boundary conditions, cut-off frequencies, dispersion relations; Antennas: antenna types, radiation pattern, gain and directivity, return loss, antenna arrays; Basics of radar; Light propagation in optical fibers.

6.1.2 DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING (EAST CAMPUS)

1. The Department

ECE department of NSUT east campus (formerly AIACTR, Govt. of NCT Delhi) has been established with the main motive to contribute significantly in teaching and research in Electronics and communications. The main focus of the department is to develop applications of electronics and communications in an integrated manner conducive to human well-being and national welfare. The curriculum of ECE comprises major areas such as Signal processing, Artificial intelligence, Machine learning, RF & microwave and Wireless Communications. The objective of the department is to prepare students for necessary core competency to succeed in entrepreneurship/industry/higher studies/research/academic career options after completing the course.

2. Courses Offered

The Department offers one Undergraduate (UG), three Postgraduate (PG) and PhD programs.

- B.Tech.-Electronics and Communication Engineering (Artificial Intelligence and Machine Learning) (120 students)
- M.Tech.- Digital communications (30 students)
- M.Tech.- VLSI (30 students)

The M. TECH programs are of two-year duration. The programs offered are of high standard and research oriented that include advanced topics.

- Doctor of Philosophy (Ph.D.)

3. Areas of Research and Available Vacancies

The faculty members are engaged in the various areas of research listed below:

- **Analog Signal Processing** - Analog signal processing, Analog microelectronics, Analog VLSI Circuits and Systems, Analog and mixed-signal integrated circuits, Modeling and simulation, Analog Filter Designing, VLSI Digital-based designs, Memory-based architectures and VLSI design of Signal processing systems.
- **Digital Signal and Image/Video signal Processing-** Filter Design, Quantum signal processing, Image and audio compression, Pattern recognition, FPGA-based Implementation of DSP systems, Optimization Techniques, DSP Algorithms and applications, Speech processing, Image processing, computer vision, Biometric Recognition, wavelets, Soft computing Techniques, Artificial Intelligence and Machine Learning, Information security.
- **RF and Microwave Engineering** –Antenna Designing, Metamaterial, Antenna arrays, Microwave components, Electromagnetic, Antennas & Radio wave propagation, Microwave filter.
- **Wireless and Optical Communication-** Multiple-input multiple-output (MIMO) systems, Multi-user based communications, Wireless Networking, wireless and Satellite communication, Internet of Things, Web of Things, FSO, Optical communication, Optical networks, Free space optical communication, AdHoc and sensor networks, Data aggregation and fusion, Cognitive Radios, Localization, Diversity techniques, Space-time coding, Cooperative communication and Free space optics. Hybrid satellite terrestrial communication systems, UAV communication systems, Underwater Or Underground communication systems.

3.1 Tentative Seats:

For the session 2022-23 (Even semester) the maximum number of seats in the Department of ECE (East Campus) are limited to

- i. **Vacancies with university fellowship : 17**

ii. Vacancies without university fellowship : 06

University reserves the right to change the number of seats.

***The table below indicates the maximum number of vacancies available in various areas of research. However, the total number of seats are as given above**

Sr. No	Area of Research	Faculty	No. of candidates to be taken in coming session	
			With Univ. Fellowship	Without Univ. fellowship
1.	RF and Microwave Engineering	1. Prof. Ashok Mittal	02	02
		2. Dr. D.K.Raheja	NIL	NIL
		3. Dr. Garima Srivastava	NIL	NIL
		4. Dr. Kamakshi	02	01
2.	Analog Signal Processing	1. Prof. R.K.Sharma	NIL	NIL
3.	Digital Signal and Image Processing	1. Prof. Rashmi Gupta 2. Dr.Richa Bhatia	02 NIL	NIL NIL
4	Digital Image/Video Signal Processing with AI & ML	1.Prof.M.Gangadharappa	02	NIL
5	Wireless and Optical Communication	1. Prof. Arti MK	02	01
		2. Prof.M.Gangadharappa	01	NIL
		3.Dr. Richa Bhatia	NIL	NIL
		4. Dr. Aarti Jain	NIL	NIL

4 Faculty Profile

4.1 Prof. Arti M.K.



- Designation, Qualifications:** Professor and HOD, Ph.D.
- Area of Interest:** Satellite Communication, Massive MIMO
UAV Communication systems
- Email:** mkarti@gmail.com, artimk@aiactr.ac.in, arti_mk@yahoo.com
- Phone:** 01126591586
- Home Page:** <http://nsuteastcampus.aiactr.ac.in/index.php/faculty/8-online-classes/57-prof-arti-m-k>

6. Selected Publications:

- a. Arti M.K., "Data Detection in Multi-Satellite Communication Systems," in **IEEE Transactions on Aerospace and Electronic Systems**, vol. 56, no. 2, pp. 1637 - 1644, Apr. 2020.
 - b. Arti M.K., "Product of Squared SR Random Variables: Application to Satellite Communication," in **IEEE Transactions on Aerospace and Electronic Systems**, vol. 56, no. 1, pp. 486-496, Feb. 2020.
 - c. Arti M.K., "Mathematical Modeling of COVID-19 and Prediction of Upcoming Wave," in **IEEE Journal of Selected Topics in Signal Processing**, 2022, doi: 10.1109/JSTSP.2022.3152674.
7. **Bio-sketch:** Arti M. K. received the B.E. degree in electronics engineering from Madan Mohan Malviya Engineering College, Gorakhpur, India, in 1997; M.Tech. degree in communications engineering and the Ph.D. degree in wireless communications from the Department of Electrical Engineering, IIT Delhi, New Delhi, India, in 2007 and 2014, respectively. She is senior member of IEEE and Fellow of IETE. She is currently a Professor with the Department of Electronics and Communications Engineering, NSUT East campus (formerly AIACTR, Govt. of NCT Delhi). Her research interests include signal processing for multiple-input-multiple-output systems, cooperative communications, satellite and UAV communications.

4.2 Prof. Ashok Mittal

1. Designation, Qualifications: Professor, PhD.
2. Area of Interest: Microwave and Millimeter wave Systems and Antennas
3. E-Mail ID: ashok.mittal@nsut.ac.in
4. Phone Number: 01143011956
5. Home Page: <http://nsuteastcampus.aiactr.ac.in/index.php/faculty/8-online-classes/55-prof-ashok-kumar-mittal>
6. Selected List of Publications:
 - a. Ashok Mittal and Umesh Bahuguna, "Wide-band PIN diode SPST Switch in Unilateral Finline", International Journal of Electronics 2001, Taylor and Francis UK, Vol. 88 No.4, pp 499-505.
 - b. Ashok Mittal and Asok De, "Balanced BPSK Modulator for Ka-Band Communication Systems", Microwave and Optical Technology Letters 2007, U.S.A, Volume 49, Issue 12, Pages 3046-3049.
 - c. Ashok Mittal, "Experimental Modeling of Groove Effect on Finline Transitions at Ka-Band", International Journal of Infrared and Millimeter Waves, U.S.A., Volume 17, Number 5, May 1996. pp 905-913



7. **Bio sketch:** Received M.Tech. degree in Microwave Engineering from the University of Delhi and the Ph.D. degree from Faculty of Technology, Delhi College of Engineering, University of Delhi. He has experience of over 34 years working with Premier Academics Institutions, Research Institutions and Industrial Organizations of India. He started his carrier as Senior Scientific Officer with Center for Applied Research in Electronics (CARE), Indian Institute of Technology (IIT) Delhi. He worked as a Scientist with DRDO, Min. of Defence at the levels of C,D and E. He was a Senior Deputy General Manager with Bharat Electronics Limited, A Defence PSU, Ghaziabad. Since 2009, he had been working as Professor with the Electronics and Communication Engineering Department, Ambedkar Institute of Advanced Communication Technologies and Research (AICT&R), Delhi, India. He was Principal of the AICT&R from July 2012 to Feb 2016. He is Senior Member IEEE and Fellow of IETE. He is author of more than 70 articles in various IEEE, International Journal of Electronics, Springer, Wiley, IJMOT, MOTL, Microwave CADs, PIERS, IETE and International Journal of Millimeter wave and Infrared. His research interests include Microwave and Millimeter Wave Antennas, Microwave and Millimeter Wave Components and Systems, Radar and Communication Systems. He worked in various Integrated Guided Missile Development Programmes of India. He worked for Akash, Nag, Prithvi and Trishul Missile Systems. He worked for Rajendra Radar Systems, Indra Radar, Rohini Radar and Fly catcher Radar. He led a team as Project Leader of TRISHUL Missile. He worked for LCA Light Combat Aircraft. He worked for C4I systems for Indian Navy and Coast Guards as IV&V Leader. He also worked on S Band Satellite Radio, Electronic warfare Systems for IL-76 and Modelling of Propagation attenuation for Millimeter Waves and IR Waves in incremental weather conditions for FOG, Rain, Dust/Sand storm and Smoke in battle field scenario. He was a recipient of the IETE IRS Young Scientist Award for Outstanding contributions in the field of Radars and Communication Systems in 1999, the NRDC technology invention award from Dept of Science and Technology, Govt. of India 2001 for his innovations for TRISHUL Missile System, the DSIR National R&D Award for BEL in 2003 and Award for outstanding contribution as Counselor to AIT-IEEE Student Chapter 2010.

4.3 Prof. (Dr) Ravindra Kumar Sharma



1. **Designation, Qualifications:** Professor, PhD.
2. **Area of Interest:** Analog microelectronics and signal processing
3. **E-Mail ID:** 21.ravindra@gmail.com
4. **Phone Number:** (+91) 9811455921
5. **Home Page:** <http://nsuteastcampus.aiactr.ac.in/index.php/faculty/8-online-classes/54-prof-ravindra-kumar-sharma>
6. **Selected List of Publications:**
 - a. Amit Saxena, Manoj Kumar, R K Sharma and R S Gupta; SOI Schottky Barrier Nanowire MOSFET with Reduced Ambipolarity and Enhanced Electrostatic Integrity, Journal of Electronic Materials, DOI: 10.1007/s11664-020-08164-0, (2020)
 - b. R. K. Sharma, T. S. Arora and R. Senani; On the realisation of canonic single-resistance-controlled oscillators using third generation current conveyors, IET Circuits, Devices & Systems, DOI: 10.1049/iet-cds.2016.0210 (2017)
 - c. V. K. Singh, R. K. Sharma, A. K. Singh, D. R. Bhaskar and R. Senani; Two new canonic single-CFOA oscillators with single resistor controls, IEEE Transactions on Circuits and Systems II: Express Briefs, DOI: 10.1109/TCSII.2005.853964 (2006)
7. **Bio-sketch:** Ravindra Kumar Sharma was born in Allahabad in 1964. He received his Diploma (Electronics Engineering) in 1984 from Institute of engineering and Rural Technology Allahabad, AMIE(India) in 1989 from The Institution of Engineers (India), M.E.(Control and Instrumentation) in 1994 from MLN NIT Allahabad and Ph.D. from University of Delhi in 2007. He has served as Assistant Lecturer in IERT (Allahabad, India) during 1985 to 1996, as Lecturer in Ambedkar Polytechnic (Delhi, India) during 1997 to 2001, as Lecturer in Netaji Subhas Institute of Technology (New Delhi, India) during 2001-2004, as Assistant Professor/Associate Professor in Ambedkar Institute of Advanced Communication Technologies and Research (AIACTR), Delhi during 2004-2013. Currently he is serving in the same institute as Professor, Electronics and Communication Engineering and since 2013 and as Principal since December, 2018. Now AIACTR has been merged with Netaji Subhas University of Technology (NSUT) and being rechristened as NSUT East Campus where he is currently working as Director of the same. His areas of research interests are Analog Microelectronics and Analog Signal Processing, Mixed signal circuit design, Circuit theory, VLSI Design. He has published over 60 articles in the form of International Journal papers, conference papers, book chapters and Book from reputed publishing houses.

4.4 Prof. Rashmi Gupta



1. **Designation, Qualifications:** Professor and Link HOD, PhD.

2. **Area of interest:** Signal, speech and Image Processing, Machine learning and Artificial Intelligence, Information Security, Biometric Recognition

3. **Phone:** 01126591586

4. **Email:** rashmig71@yahoo.com; rashmi.gupta@nsut.ac.in;

5. **Home Page:**

<http://nsuteastcampus.aiactr.ac.in/index.php/faculty/8-online-classes/56-prof-rashmi-gupta>

6. Selected Publications

- a. Rajiv Kapoor, Rashmi Gupta, "Non-Linear Dimensionality Reduction using Fuzzy Lattices," *IET Computer Vision*, vol. 7, no. 3, pp.201-208, June 2013, SCI, IF 1.524, DOI: 10.1049/iet-cvi.2012.0097.
- b. Tanupreet Sabharwal, Rashmi Gupta, "Human Identification after Plastic Surgery using Region based Score Level Fusion of Local Facial Features", *Journal of Information Security and Applications*, Elsevier, Vol. 48, page 102373, October 2019, (SCIE, 2017 IF = 2.327), <https://doi.org/10.1016/j.jisa.2019.102373>
- c. Tanupreet Sabharwal, Rashmi Gupta, Le Hoang Son, Raghendra Kumar, Sudan Jha (2018), "Recognition of Surgically Altered Face Images: An Empirical Analysis on Recent Advances", *Artificial Intelligence Review*, Springer, 52, 1009–1040, September 2018 (SCI, 2017 IF = 5.942), DOI: 10.1007/s10462-018-9660-0

7. **Bio-Sketch:** Prof. Rashmi Gupta has done her M.E. and Ph.D. degree in Electronics & Communication Engineering from Delhi College of Engineering, Delhi University. She received her Bachelor degree in Electronics & Communication Engineering from Institute of Electronics and Telecommunication Engineering Delhi. She has rich industrial experience of eight years and teaching experience of nineteen years. She is also holding position of founder Director of Incubation center AIACTR-IRF funded by Delhi Govt. She has authored over 85 research papers in various renowned international journal and conferences. Her two patents are published and one is filed. She has also been associated with many International research organizations as technical program committee member, editorial board member and reviewer. Her research interests include Biometric Recognition, signal and image processing Artificial Intelligence. She is Fellow Member of IETE and Senior Member of IEEE.

4.5 Prof. Soven K. Dana

1. Designation, Qualifications: Professor, Ph.D.
2. Areas of Interest: AI & ML, Quantum Tech. and Optical Networking.
3. Email: sovenkd@gmail.com
4. Phone :+91-9953413739
5. Homepage:
<http://nsuteastcampus.aiacr.ac.in/index.php/faculty/11-ece-facult-list/58-prof-soven-kumar-dana>



6. Selected Publications:

- a. S. K.Dana, C. P. S. Dogra, S. Kumar, and E. Heistermann, System for translating instruction in a switch node, US Patent - 9288558, March 15, 2016.
- b. Shubham Mittal, and Soven K. Dana, Gender Recognition from Facial Images using Hybrid Classical-Quantum Neural Network, 2020 IEEE Students Conference on Engineering & Systems, July 10-12, 2020, Prayagraj India.
- c. S.K. Dana, H. Shimasaki, and M. Tsutsumi, Efficient Optical Control of Millimeter-waves in a Slot Line on Semiconductor Plasma Substrates, IEEE Transactions on Microwave Theory and Techniques, Vol. 50, No. 1, pp. 207-210, January 2002

7. Bio-Sketch: Prof. Soven Kumar Dana has received B.E. in Electronics and Telecommunication Engineering from Bengal Engineering College, Shibpur, the University of Calcutta and M.E. in Electronics and Telecommunication Engineering from Jadavpur University, Kolkata. He has been selected and recommended by the Ministry of HRD, Government of India for the Japan Government Scholarship for research study in Japan; he has studied in Japan and has received PhD from Kyoto Institute of Technology, Kyoto, Japan as Japan Government Scholar. He has authored several papers and his papers have been published in various international journals including the IEEE Transactions and Conferences. He has several years of experience in the Industry; and has worked in leading roles as Senior Manager and Director in reputed organizations. He has experience of working in Government of India organization as well as in MNCs on the R&D of Electronics, Communications, Optical Networking and Networked Systems. He has authored two granted Patents on networking system design - an Indian Patent and a US Patent. Presently, he is Professor in the Department of Electronics and Communication Engineering. His current research interest includes Optical Networking, Quantum Technologies and AI & ML.

4.6 Prof. M GANGADHARAPPA

1. **Designation, Qualifications:** Professor, B.Tech, M.Tech, Ph.D

2. **Areas of Interest:** Image & Video signal processing, Artificial Intelligence & Machine Learning, Mobile and Wireless Communication.

3. **Email:** gangadhar@aiactr.ac.in,
m.gangadharappa@nsut.ac.in

4. **Homepage:** <http://aiactr.ac.in/index.php/academics/faculty-profile/ece-faculty-link/37-mgangadharappa>

5. **Selected Publications:**

a. M. Gangadharappa, Rajiv Kapoor, Hirdesh Dixit., “An Efficient Hierarchical 16-QAM Dynamic Constellation to Obtain High PSNR Reconstructed Images under Varying Channel Conditions”, IET Communications journal (ISSN: 1751-8628, SCI/SCIE Journal with Impact Factor: 1.664), vol.10, Issue 2, pp.139-147, 2016. <https://doi.org/10.1049/iet-com.2015.0693>

b. P Kansal, A Kumar, M Gangadharappa, “Optimized Extreme Learning Machine for Intelligent Spectrum Sensing in 5G systems”, Journal of Communications Technology and electronics (ISSN: 1064-2269, SCI/SCIE Journal with Impact Factor: 0.529), vol. 66, No. 3, pp. 322-332, 2021. <https://doi.org/10.1134/S1064226921040045>

c. ParnikaKansal, M Gangadharappa, A Kumar, “An Efficient Composite Two-Tier Threshold Cooperative Spectrum Sensing Technique for 5G Systems”, Arabian Journal for Science and Engineering (ISSN: 2193- 567X, SCIE Journal with Impact Factor 2.334), 2021.<https://doi.org/10.1007/s13369-021-05938-4>

6. **Bio-Sketch:** Dr M. Gangadharappa did his B.Tech in Electronics and Communication from Delhi College of Engineering, University of Delhi. Obtained his M.Tech degree from Indian Institute of Technology (IIT) Kanpur, in Microwave and Mobile Communication and Ph.D. degree from Delhi Technological University on thesis titled, “Real Time Analysis of Video Behaviour Profiling”. Having experience of more than 9 years as Engineer in Doordarshan, Prasar Bharti, Broadcasting Corporation of India, Ministry of Information and Broadcasting, New Delhi. Further he worked as Assistant Professor, ECE for a period of 9 years with Indira Gandhi Delhi Technical University for Women (IGDTUW), formerly part of GGSIP University, Kashmiri Gate, Delhi. He is a member of professional bodies like IEEE, IETE, ISTE. Presently he is also serving as Director, AIACTR Incubation and Research Foundation, Geeta Colony, Delhi. Working as President, Institution’s Innovation Council (IIC), an initiative of MHRD, New Delhi. He delivered



expert lectures in All India Radio/ Doordarshan, AICTE/TEQUIP sponsored FDP programmes, National Seminars etc. He is actively involved as reviewer for Various International journals and also the research papers submitted for International Conferences.

4.7 Dr. Richa Bhatia

1. Designation, Qualifications: Associate Professor, Ph.D.

2. Area of Interest: Wireless Communication, Optical Communication, Signal & Image Processing, Digital Communication, Free Space Optics (FSO), Radio over Fiber (RoF), Computer Networks: Elastic Optical Networks

3. E-mail: richatimes@gmail.com, richa.bhatia@nsut.ac.in

4. Phone: +91 9999039207

5. Home Page: <http://nsuteastcampus.aiactr.ac.in/index.php/faculty/11-ece-facult-list/60-dr-richa-bhatia>



6. Selected Publications:

- a. Anu Goel and Richa Bhatia "Joint Impact of Interference and Hardware Impairments on the Performance of Mixed RF/FSO Cooperative Relay Networks" *Optical and Quantum Electronics*, Springer, Volume 53:53(2021) <https://doi.org/10.1007/s11082-021-03064-x> (SCI) Impact factor: 2.084
- b. Anu Goel and Richa Bhatia "On the performance of mixed user diversity- RF/spatial diversity-FSO cooperative relaying AF systems" *Optics Communications*, Elsevier, ScienceDirect, Volume 477, 15 December 2020, 126333 <https://doi.org/10.1016/j.optcom.2020.126333> (SCI) Impact Factor: 2.31
- c. Richa Bhatia, Saurabh Prakash, Ekta Saini, "Performance improvement of 60-GHz wireless optical systems with reverse-parallel hybrid modulation scheme" *International Journal of Communication Systems*, Wiley, Volume 32, Issue 2, January, 2019, 32:e3848 <https://doi.org/10.1002/dac.3848> (SCI) Impact factor: 2.047

7. Bio-Sketch: Dr. Richa Bhatia is currently an Associate Professor of Electronics and communication Engineering at NSUT and In-Charge Examination. She is also serving as In-Charge AICTE-Smart India Hackathon activities. Previously she has worked as an Assistant Professor in Department of Electronics and Communication Engineering in Guru Nanak Dev Engineering College, Ludhiana (2003 – 2011). She has done her Ph.D. on High Bit Rate Optical Systems. She has authored over 50 research papers in various renowned international journal and conferences. Her

research interests include Wireless Communications, Optical Systems and Networks, Radio over Fiber (RoF), Free-Space Optical (FSO) Communications, Elastic Optical Networks (EON), Digital Communication, Signal and Image Processing, Internet of Things etc. Currently five PhD research scholars are working under her guidance. She is Reviewer for reputed International Journals like IEEE Transactions on Intelligent Transport Systems, IEEE Communications Magazine, International Journal of Communication Systems, Wiley, International Journal of Microwave and Wireless Technologies, Wiley. She has delivered various Invited lectures in IEEE International Conferences and Workshops. She has been associated with many professional organizations as technical program committee member and member board of studies. She is a Life Member of ISTE and Senior Member IEEE.

4.8 Dr. Manisha Khulbe

1. **Designation, Qualification:** Assistant Professor, PhD
2. **Areas of Interest:** Optical communication, Signal Processing, THz Communication, Quantum optics, Plasmonics
3. **E-mail:** manisha.khulbe@aiactr.ac.in
4. **Phone:** +91 9910108550
5. **Home Page:** <http://nsuteastcampus.aiactr.ac.in/index.php/faculty/17-list-of-ece-faculty/62-dr-manisha-khulbe>



6. Selected Publications

- a. M Khulbe, H Parthasarathy, MR Tripathy, “Parameter estimation of an inhomogeneous medium by scattered electromagnetic fields using nonlinear optics and wavelets,” Progress In Electromagnetics Research 2018, Vol 85, pg. 35-50
 - b. M Khulbe, MR Tripathy, H Parthasarathy, “Wavelet-based method for nonlinear inverse scattering problem using least mean square estimation” Progress In Electromagnetics Research Symposium-Spring (PIERS), 2017, IEEE, St Petersburg, Russia, 496-501
 - c. M Khulbe, H Parthasarathy, MR Tripathy, “Mathematical analysis of RF imaging techniques and signal processing using wavelets”, International Journal of Signal and Imaging Systems Engineering 2017, vol10 (6), 286-300
7. **Bio-sketch:** Dr Manisha Khulbe received her B.Tech degree in Electronics from Institute of Engineering and Technology Lucknow, India in 1995 and M. Tech degree in Signal Processing from Netaji Subhash Institute of Technology, Delhi University Delhi in 2006. She has been working as Assistant Professor in Ambedkar Institute of Advanced Communication Technologies and Research in Department of Electronics and Communication for last 12 years. Prior to this she has also worked as Assistant Professor in Department of Electronics and Communication, Technology College, Gobind Ballabh Pant University of Agriculture and Technology Pantnagar, Udham Singh Nagar

Uttarakhand. She was awarded PhD degree in 2019 from Amity University Noida. She has teaching experience in Digital signal processing, Optical communication, Radar Signal Processing, Radar Systems, Computational techniques in Electromagnetics and Wavelets transforms. Administrative experience: She has been in various administrative assignments and student activities. She worked as Assistant warden of Girls hostel for two years in G.B. Pant University Uttarakhand and worked as Examination in charge for one and half year in Ambedkar Institute of Advanced Communication Technologies and Research N. Delhi. She was Coordinator M.Tech Signal Processing in 2008-2009. Organizer of FDP on “THz communication and Image processing” in Jan 2018 for one week .She has been in the technical programme committees and organizer of special session of SPIN in 2018 and 2019.

4.9 Dr. Dinesh Kumar Raheja

1. **Designation, Qualifications:** Assistant Professor, Ph.D.
2. **Areas of Interest:** Microstrip Antennas, Microprocessors, Switching Theory
3. **E-mail:** dineshraheja102@gmail.com
4. **Phone:** +91 9868283257
5. **Home Page:** <http://nsuteastcampus.aiactr.ac.in/index.php/faculty/17-list-of-ece-faculty/70-dr-d-k-raheja>
6. **Selected Publications:**
 - a. Dinesh Kumar Raheja, Binod Kumar Kanaujia, Sachin Kumar, “A Dual Polarized Triple Band Stacked Elliptical Microstrip Patch Antenna for WLAN Applications”, ISSN 0929-6212 Volume 100, Number 4, Wireless Personal Communications (2018) 100:1585-1599; <https://link.springer.com/article/10.1007%2Fs11277-018-5655-z> (Springer)
 - b. Dinesh Kumar Raheja, Binod Kumar Kanaujia, Sachin Kumar “Compact four-port MIMO antenna on slotted-edge substrate with dual-band rejection characteristics”, International Journal of RF Microwave Computer Aided Engineering 2019; e21756. <https://doi.org/10.1002/mmce.21756> (Wiley)
 - c. Dinesh Kumar Raheja, Binod Kumar Kanaujia, Sachin Kumar, “Low Profile Four-Port Super-Wideband MIMO Antenna with Triple Band Rejection Characteristics”, International Journal of RF Microwave Computer Aided Engineering 2019; e21831. <https://doi.org/10.1002/mmce.21831> (Wiley)
7. **Bio-sketch:** Dr Dinesh Kumar Raheja received B.E. (Electronics) degree in 1991, from Marathwada University, Aurangabad, Maharashtra, India. Heworked in industry, as R&D Engineer/Senior Engineer in CalcomElectronics Ltd; Samtel India Ltd; & Ahuja Radios,



New Delhi, till 1998; before joining as Lecturer at Ambedkar Polytechnic, Government of Delhi. He obtained post-graduate degree in 2005, i.e. M.E.(Electronics and Communication Engineering) from Delhi College of Engineering, (Delhi University). In July 2008, he was appointed as Assistant Professor (ECE) at Ambedkar Institute of Advanced Communication Technologies & Research, (now East Campus – NSUT) Delhi, and since June 2012, he is been working as Associate Professor (ECE). He obtained Ph.D. degree from GGSIP University, Delhi, in 2020.

4.10 Dr.C.S. Vinitha

1. **Designation, Qualification:** Assistant Professor, Phd Thesis Submitted.
2. **Area of Interest:** VLSI
3. **Email:** cvinitha1972@aiactr.ac.in,
vinithavinod1996@gmail.com
4. **Phone:** 011-22405086, 9873549840
5. **HomePage:** <http://nsuteastcampus.aiactr.ac.in/index.php/faculty/17-list-of-ece-faculty/65>
6. **Publications:**
 - a. **C.S. Vinitha**, Prof. R. K. Sharma, “An Efficient LUT Design on FPGA for Memory-Based Multiplication”, Iranian Journal of Electrical and Electronic Engineering Vol. 15, No. 4, December 2019. DOI: 10.22068/IJEEE.15.4.462
 - b. **C.S. Vinitha**, Prof. R. K. Sharma, “New Approach to Low-Area, Low-Latency Memory-Based Systolic Architecture for FIR Filter”, Taylor and Francis Journal of Information and Optimization Sciences Vol.40, No.2, pp.247–262, 2019. DOI : 10.1080/02522667.2019.1578087
 - c. **C.S. Vinitha**, Prof. R. K. Sharma, “Area and Energy-efficient Approximate Distributive Arithmetic architecture for LMS Adaptive FIR Filter”, IEEE 2020 International Conf. for Emerging Technology, (INCET) DOI: 10.1109/INCET49848.2020.9154125.
7. **Bio-Sketch:** C S Vinitha received her B.E in Electronics and communication Engg. From Bharathiar university, Coimbatore, Tamilnadu in 1993 and M.Tech in Digital communication from AIT, GGSIPU. She worked as Lecturer in Govt women’s polytechnic, Trivandrum from March’1994 to August’1996. Then she worked as Lecturer in Fr. Agnel Poltechnic, Delhi from September’1997 to May’2007. She joined AIACTR as Assistant Professor in May’2007 and continuing here for the past 13 years. She has submitted her P.hd thesis in GGSIPU in March’2020. She worked as member of Examination cell from 2010 to 2011 and subsequently working as Deputy In-charge of exam cell from 2012 till



date. She co-coordinated one week STP program held in AIACT&R from 11th to 15th June'2018 on the topic "Quality technical education with NBA". She co-coordinated two day workshop held in AIACT&R from 18th to 19th July'2018 on the topic "Excellence in technical education through NAAC". She has also been in the technical program committees of various international conferences such as INDIACOM-2017, 2018, 2019. She also worked as member organizing committee in one week FDP also worked as member organizing committee in two day workshop. Her area of interest includes Digital design, VLSI Digital-based designs, Memory-based architectures and VLSI design of Signal processing systems.

4.11 Dr. Aarti Jain

1.Designation, Qualifications: Assistant Professor, Ph.D.

2.Areas of Interest: 5G communications, Internet of Things, Wireless Communications, Adhoc and Sensor networks, free space optics, Fuzzy logistics, AI and machine learning.

3.Email: aartijain@aiactr.ac.in

4.Phone: 9871588459

5.Homepage: <https://scholar.google.com/citations?user=ITDGK0IAAAAJ&hl=en6>

6. Selected Publications:

- a. **Aarti Jain** "Betweenness centrality based connectivity aware routing algorithm for prolonging network lifetime in wireless sensor networks." *Wireless Networks*, Springer (2015): 1-20. **SCI** indexed. **(Impact factor: 2.659)**
- b. **Aarti Jain**, "Traffic Aware Channel Access Algorithm for Cluster Based Wireless Sensor Networks". *Wireless Personal Communications*, Springer, 96(1), 2017, 1595-1612. **SCIE** indexed. **(Impact factor: 1.779)**
- c. **Aarti Jain** and BV Ramana Reddy. "Eigenvector centrality based cluster size control in randomly deployed wireless sensor networks." *Expert Systems with Applications* 42, no. 5 (2015): 2657-2669. **SCI** indexed. **(Impact factor: 5.452)**

7. Bio-Sketch

Aarti Jain received her B. TECH in Electronics & Communication Engineering from Beant Govt. College of Engineering, Punjab in 2002 and M.E. in Electronics & Communication Engineering from Delhi College of Engineering, New Delhi in 2009. She received her Doctorate in 2016 from Guru Gobind Singh Indraprastha University in the field of Wireless Sensor Networks. She has more than 17 years of teaching



experience. Her research interests include the Internet of Things, free space optics, 5G communications, wireless sensor networks, fuzzy logistics, Bio-inspired computing & its application. She is senior member of IEEE and an Associate member of IET. She has guided several students for B.Tech and M.Tech projects and is guiding students for Ph.D. She served as Chairperson and session chair in various International Conferences. She has delivered various Invited lectures in International Conferences and Workshops. She has authored several research papers in SCI indexed journals and international conferences. She has also edited a book on the web of things and authored several book chapters on upcoming technologies.

4.12 Dr. Garima Srivastava

1. **Designation, Qualifications:** Assistant Professor; PhD
2. **Area of Interest:** RF and Microwave Engineering; Antenna Designing; Wireless Communication; Internet of Things
3. **Email:** garima.shrivastav@aiactr.ac.in; garima.shrivastav@gmail.com
4. **Phone:** +918800916945
5. **Home Page:** <http://nsuteastcampus.aiactr.ac.in/index.php/faculty/8-online-classes/64-dr-garima-srivastava>
6. **Selected Publications:**
 - a. **Garima Srivastava**, B.K Kanaujia “Compact dual band notched UWB MIMO Antenna with shared radiator”, Microwave optical technology letters/vol 57,no 12,dec 2015.
 - b. **Garima Srivastava**, B.K Kanaujia, Rajeev Paulus“UWB MIMO antenna with common radiator” International Journal of Microwave and Wireless Technologies, page 1 of 8. Cambridge University Press and the European Microwave Association, 2016.
 - c. **Garima Srivastava**, Le Hoang Son, Raghvendra Kumar &ManjuKhari “A Dual Band Notched Ultra-Wideband Antenna” Wireless Personal Communications, <https://doi.org/10.1007/s11277-019-06771-7>. 2019
7. **Bio Sketch:** Dr.GarimaSrivastava received her B.Tech degree in Electronics and Communication from J.K Institute Allahabad University, India in 2000 and M.Tech degree in Electronics from J.K Institute Allahabad University in 2002.She is working as an Assistant Professor in Ambedkar Institute of Advanced Communication Technologies and Research since 2011.She is a senior member of IEEE .She has chaired IEEE conferences and also been technical programme committees of various conferences.She has been teaching courses on Microwave Engineering, Antenna and Wave Propagation, Analog Electronics, Wireless Communication, Smart Antennas. She received her PhD degree in Electronics from SHIATS institute, Naini Allahabad deemed to be University. Her research interest includes RF and Microwave Engineering, Antenna Designing, Wireless Communication, Internet of Things

4.13 Dr.Sanjeev Kumar

1. **Designation, Qualifications:** Assistant Professor, Ph.D.
2. **Area of Interest:** Antenna and Communication
3. **Email:** sanjeevkumar@aiactr.ac.in
4. **Phone:** 9560418279
5. **Home**
Page:<http://nsuteastcampus.aiactr.ac.in/index.php/faculty/11-ece-facult-list/66-dr-sanjeev-kumar>
6. **Selected Publications**
 - a) Sushmita Bhushan, Sanjeev Kumar "Detection of Water Quality using Defected Ground Double Split Ring Resonator" International Journal of Recent Technology and Engineering (IJRTE) ISSN: 2277-3878, Volume-8 Issue-4, November 2019.
 - b) Sumedha Sagar, Sanjeev Kumar, Vandana Gupta "NGPON2: A High Performance Passive Optical Network Technology" IEEE International Conference INDIACom-2018.
 - c) Nitin Kumar Agrawal, Nikhil Kumar, Dr. Sanjeev Kumar "Increased Embedding Rate by Reversing the Order of Data Hiding and Encryption" International Journal of Engineering and Management Research, July-August 2017.
7. **Bio-Sketch:** Sanjeev Kumar has completed his degrees B Tech, M Tech, and Ph D in Electronics and Communication Engineering. He is a life member of Indian Society for Technical Education (ISTE). His current research includes metamaterial, reconfigurable antenna and communication. He has guided 29 post graduate students. He is associated with many professional activities and has published research papers in international journals and conferences. He has attended/ organized more than 18 faculty development programs/ workshops/ conferences. He has also been in the technical programme committees of various international conferences.

4.14 Dr. Avinash Kumar

1. **Designation, Qualifications:** Assistant Professor, Ph.D
2. **Areas of Interest:** Biomedical Engineering, Robotics, Control Systems
3. **E-mail:** avinashk_ait@yahoo.in
4. **Phone:** +91 9266495339
5. **Homepage:**<http://nsuteastcampus.aiactr.ac.in/index.php/faculty/18-list-of-sah-faculty/72-avinash-kumar>
6. **Selected Publications:**



- a. A. Kumar, D. Sajal Kumar Babu, R. P. Tewari (2020) “Development of novel ‘Feed-forward Neural Network controller with feedback PID’ for control of Pneumatic Artificial Muscle actuator” in proceedings of 1st International Conference on Robotics, Intelligent Automation and Control Technologies (RIACT 2020), October 2-3 at Vellore Institute of Technology, Chennai, India
 - b. A. Kumar and R. P. Tewari (2019) “Modeling and Controller design for Pneumatic Artificial Muscle for Ankle-foot orthotic device”, International Journal of Engineering and Advanced Technology (IJEAT), Volume 9, issue 1, October 2019 (ISSN 2249-8958)
 - c. A. Kumar and R. P. Tewari (2019) “Pneumatic Artificial Muscle: A Bio-inspired actuator for Bio-Robotic Applications”. In proceedings of 5th students’ conference on Engineering and Systems (SCES-2019), May 29-31 at MNNIT, Allahabad, India
7. **Bio-Sketch:** Dr. Avinash Kumar received his B.Sc(Engg.) degree in Electrical Engineering from Muzaffarpur Institute of Technology, Muzaffarpur, India in 2004 and M. Tech degree in Process Control Engineering from Netaji Subhas Institute of Technology, Delhi University, Delhi, India in 2006. He has received his Ph.D degree from Motilal Nehru National Institute of Technology, Allahabad for his research in Biomedical Engineering. His thesis title is “Modeling, Simulation and Control of Bio-Inspired Actuator for Rehabilitation Applications”. He had scored 99.56 percentile in CAT. He had been a student of FPM program at IIM Ahmedabad in 2009-2010 but left it after one year in order to pursue his social-entrepreneurship dreams. He had also cleared Civil Services Mains Examination twice and Engineering Services (Written) Examination thrice. He is working as Assistant Professor in Netaji Subhas University of Technology – East Campus (formerly AICT&R) for the past 9 years. His research interests include Control systems, Robotics and Biomedical Engineering.

4.15 Dr. Kamakshi

1. **Designation, Qualification:** Assistant Professor, Ph.D
2. **Area of Interest:** Microstrip Antenna, RF and Microwave
3. **Email:** kamakshi.kumar2020@aiactr.ac.in
4. **Phone No. :** 8368413484



5. **HomePage:** <https://scholar.google.com/citations?user=MyQChBcAAAAJ&hl=en&authuser=1>
6. **Selected Publications:**

- a. **Kumari Kamakshi**, J. A. Ansari, Ashish Singh, Mohammad Aneesh, and Aravind K. Jaiswal, “A Novel Ultra Wideband Toppled Trapezium Shaped Patch Antenna With Partial Ground Plane,”

Microwave and Optical Technology Letters, Vol. 57, No. 8, PP.1983-1986, 2015 (**SCI Impact Factor: 0.948**).

- b. **Km. Kamakshi**, J. A. Ansari, Ashish Singh, Mohammad Aneesh, "Analysis of L-probe Proximity Fed Annular Ring Patch Antenna for Wireless Applications", Wireless Personal Communication , Vol.77, PP.1449-1464, 2014. (**SCI Impact Factor: 1.2**).
- c. J. A. Ansari, **Kamakshi Kumari**, Ashish Singh, Anurag Mishra, "Ultra Wideband Co-planer Microstrip Patch Antenna for Wireless Applications", Wireless Personal Communication, Vol.69, PP.1365-1378, 2013. (**SCI Impact Factor: 1.2**).

7. Bio-Sketch:-Dr. Kamakshi received her B.Tech. degree in Electronics Engineering from the Institute of Engineering and Rural Technology Allahabad, U.P., India in 2007. She Completed her M.Tech. degree in Communication Technology and Ph.D degree in Microstrip Antennas from J.K. Institute of Applied Physics and Technology, University of Allahabad in 2009 and 2017 respectively. Her current area of research is microstrip antenna. She is presently working as Assistant professor in Netaji Subhas University of Technology (East Campus) (Formely Ambedkar Institute of Advanced Communication Technologies & Research, Geeta Colony, Govt. of NCT of Delhi).

4.16 Dr. Krishna Patteti

1. **Designation, Qualification:** Assistant Professor, Ph.D
2. **Area of Interest:** Signal Processing for wireless Communications, MIMO Communications, LTE, LTE-A, 5G, wireless Communications
3. **E-mail:** kpatteti@aiactr.ac.in
4. **Phone:** +91-9963309062, +91-9398810668
5. **Homepage:** <http://nsuteastcampus.aiactr.ac.in/index.php/faculty/11-ece-facult-list/69-dr-krishna-patteti>



6. Selected Publications:

- a. Sharmil Pandya, Patteti Krishna, Ravi Shankar, Ankur Singh Bist, "Examination of the Fifth Generation Vehicular SWIPT Cooperative NOMA Network in Military Scenario considering Time Varying and Imperfect Channel State Information Conditions", Journal of Defense Modeling and Simulation (JDMS).
- b. Naraiiah R, Dr. Mukesh Tiwari, Dr Patteti Krishna," Review of Techniques in Massive MIMO "Turkish Journal

of Physiotherapy and Rehabilitation, Vol 32, issue 2, pp 330-337.ISSN 2651-4451.

7. Bio-Sketch:Dr. Patteti Krishna received the B. Tech. degree in Electronics and Communication Engineering, M. Tech. degree with specialization in Digital Systems & Computer Electronics under the faculty of ECE and Ph.D degree in Electronics and Communication Engineering from Jawaharlal Nehru Technological University Hyderabad in 2005, 2008 and 2017 respectively. He has over 13 years of teaching and research experience. Presently, he is working as an Assistant Professor in the department of ECE at Ambedkar Institute of Advanced Communication Technologies & Research (AIAC&R), New Delhi, Govt.of NCT of Delhi. He has about 40 publications to his credit. His research interests include Digital Systems, Wireless Communications and Networks, MIMO-OFDM and Signal Processing for wireless communications.He has guided several students for B.Tech and M.Tech projects and is guiding one student for Ph.D. He has participated in two weeks of Short-term Training Programmes sponsored by AICTE / ISTE / DST, India and has delivered lectures in various workshops and seminars. He has organized various training programmes for Faculty and Students in the field of ECE. He has been a reviewer in various IEEE Conferences, Editorial member of IJETEST, Reviewer of IIENG International Conferences and advisory committee member of various international conferences and has chaired sessions in Conferences. He visited HONG KONG, MALAYSIA, SINGAPORE AND JAPAN for attended and presented IEEE International Conferences. He received a Young Scientist award from IOSRD, Chennai in 2018 and Professor of the year from Tutors Pride's ideal Teaching award 2018. He is a Member of IEEE, life time member of CSI, and Life Member of Indian Society for Technical Education (ISTE).

5. Laboratory Infrastructure

5.1 Digital Signal Processing Lab: DSP Laboratory has been setup in order to facilitate Students and research scholars to conduct cutting edge research in the field of signal processing, image processing, adaptive signal processing, pattern recognition, speech processing etc.. DSP lab has good quality infrastructure for carrying out UG and PG experiments. The facilities include: DSP kits 6713, DSP kits 6711, DSP kits 6416, MSP kit, DSP starter kit 6701, DSP kit 5416, DSP kit Trinity, Code composer studio v 2.1, Code composer studio v 3.1, DPO 4000, NI speedy 33 kits, Compact vision system, Embedded vision system, Smart camera, Finger print authentication kit, Image daughter card, Ni elvise board, Ni DAQ card, Function generators, CROs.

5.2 Wireless Communications Lab: The wireless communications lab has been recently set up to carry out research in the field of wireless

communications. This lab is engaged in research and education in the broad area of wireless communications and networking viz. 5G communications, IoT, Wireless sensor networks, broadband wireless access and cognitive radios. This lab is well equipped with latest simulator & emulator and FPGA based wireless application developer kits.

5.3 EMI/EMC Lab: EMI/EMC Lab is equipped with latest state of art experiment on Conducted Emission using LISN, Radiated susceptibility, Radiated emission, Characterization of EMI sensors, Characterization of LISN, Study of spectrum analyzer, Study of radiated emission using GTEM cell, Study of radiated susceptibility using GTEM cell.

5.4 RF Components and Systems Design Lab: The Lab is equipped with ADS, and Matlab Software for the design of RF systems and Modeling of propagation attenuation of Millimeter Waves and IR Waves in incremental weather conditions. The Lab also supports the Projects from DRDO.

5.5 Microwave Engineering Research Lab: Microwave Research Lab is involved in research work in the area of Antenna design, RF Systems and Electromagnetic waves. Our major area of research involves simulation, design and development of Micro-strip Antenna, Microwave Integrated Circuits and Broadband Antennas. The lab is equipped with all the state-of-the-art facilities for simulation and measurement of planar/non-planar microwave components and Antennas.

5.6 Microwave Engineering Lab: Microwave engineering laboratory provides depth knowledge about the Microwave Components and in analyzing the microwave equipment's. The laboratory exercises are designed to give students ability to design, build, and analyses the components. It provides the student to uses Microwave bench setup. A key part of the microwave laboratory experience is to learn how to use microwave test equipment to make measurements of power, frequency, S parameters, SWR, return loss, and insertion loss. Scattering parameters of microwave components are defined and used to characterize devices and system behavior. Passive and active devices commonly utilized in microwave subsystems are analyzed and studied.

5.7 Digital Circuits and System Lab: DCS lab has the infrastructure for carrying out UG level experiments for the subject based on digital logic circuits. Also the hardware and Software required for conducting labs based on VHDL and Verilog. The FPGA Boards available in the lab facilities the students to do both UG and PG level projects. The Lab has Logic Analyzer for analysis of digital circuits.

5.8 Optical Communication Lab: Lab is equipped with different types of optical fibres related experiments from basics to the high-end experiments in optical communication. Oscilloscopes, DPOs and function generators from MHz to GHz range are available for the measuring instruments. Lab is well equipped with Lasers, LED, Trainer

kits, Photodiodes and Avalanche photodiodes. Optical Fibre Transmitter and Receiver circuits are available in the lab. Lab has a research facility for M.Tech and PhD scholars to study the Experiments on fibers and fiber communication.

- 5.9 Circuits and Systems Lab:** The circuit and system laboratory is an important lab of the Electronics and Communication Department. This laboratory is mainly designed for undergraduate students to enable them to understand the basic concepts and techniques of circuits and systems. The main purposes of this laboratory is to add-on the theory course of circuits and systems with practical implementation of simple circuits like RLC circuit, verification of network theorems, two-port network etc. on bread board. This laboratory is equipped with CROs, function generators, multi-meters, two-port network trainer kits, bread boards, and power supplies. Students are also able to make small projects in this lab.
- 5.10 Analog Electronics Lab:** Analog Electronics lab is one of the well-equipped and enriched lab of the institute. The lab has infrastructure and facilities to carry out research work in the broad areas of Analog Integrated Circuits & Signal Processing and UG & PG experiments. The Lab has 12 sets of multi-purpose lab stations, 200 Mhz 2 channel and 4 channel oscilloscopes, Analog IC tester, LCR meter, function generators and OrCAD Pspice simulator.
- 5.11 Digital Communication Lab:** The lab established to provide practical knowledge for the students of B.Tech and M.Tech subjects. The lab having infrastructure to provide practical insight for subjects like Digital Communications (B.Tech), Advanced Digital Communication systems (M.Tech), Advanced Mobile Computing (M.Tech) etc. The lab recently enriched with IoT Kits, to study the applications of communication modules.
- 5.12 Electrical Technology Lab:** Electrical Technology Lab deals with basic Electrical Engineering experiments which are performed by the students of all the Engineering branches in first year. In this lab the students see Motors, Generators and Transformers probably for the first time in their life and perform experiments on them. In addition to this the first year students learn how to connect simple electrical circuits with AC and DC voltage sources and to connect multi-meter as ammeter and voltmeter, wattmeter, energy-meter etc. for measuring voltage, current, power, Power factor (pf) and energy (consumed in units) in an electrical circuit. The students get fascinated to see and learn all these things when they join Engineering after their school life.
- 5.13 Mixed Signal Circuit Design Lab:** This lab has been setup in order to facilitate research scholars to conduct cutting edge research in the field of mixed signal circuit design and signal processing. The lab has Cadence CMOS design university bundle 20 users license, workstations and servers along with networking support.

5.14 Communication Systems Lab: Communication systems Lab has the infrastructure for carrying out UG level experiments for the subject based on analog communication systems. It has the hardware setup for designing and testing communication systems. Lab has digital storage oscilloscopes for analysis of communication systems. It has OPTISYSTEM simulation tool for carrying out UG/PG experiments and research in the area Fiber Optical Communication Systems. Apart from these institute has a microprocessor lab, Embedded systems lab, VLSI lab and Control systems lab.

6. ELIGIBILITY WITH RESPECT TO BACHELORS & MASTERS DEGREE.

List of Degrees in B. Tech. / B.E./B.Sc. Engg. considered for admission

1. Electronics Engineering,
2. Electronics and Communication Engineering,
3. Electronics and Telecommunication Engineering and
4. Electronics and Instrumentation Engineering
5. Electronics and Electrical Engineering

With M. Tech. specialization in any of the branches mentioned below.

1. Communication and Networking,
2. Communication and Signal Processing,
3. Communication Engineering,
4. Communication Engineering and Signal Processing,
5. Communication Networks,
6. Digital Communication,
7. Digital Communication Engineering
8. Digital Communications and Networking,
9. Digital Electronics,
10. Digital Electronics and Communication,
11. Digital Electronics and Communication Engineering,
12. Digital Electronics and Communication Systems,
13. Digital Electronics Engineering,
14. Digital Image Processing,
15. Digital Signal Processing
16. Electronics and Communication (Communication System Engineering)
17. Electronics and Communication (Signal Processing and Communication)
18. Electronics and Communication (Signal Processing and VLSI Technology)
19. Electronics and Communication (VLSI Design)

20. Electronics and Communication (VLSI System Design)
21. Electronics and Communication (Wireless Communication Systems and Networks)
22. Electronics and Communication (Wireless Communication Technology)
23. Electronics and Communication Engineering
24. Electronics and Tele-Communication Engineering
25. Electronics and Telecommunication Engineering (Radio and System)
26. Electronics and Telecommunication Engineering (Technologynician Electronic Radio)
27. Electronics and Telecommunications Engineering
28. Electronics Design and Technology
29. Electronics Design Technology
30. Electronics Engineering
31. Electronics Product Design and Technology
32. Electronics Systems and Communication
33. Electronics Technology
34. Electronics Tele Communication
35. Embedded and Real Time Systems
36. Embedded Control Systems
37. Embedded System and Computing
38. Embedded System and VLSI
39. Embedded System and VLSI Design
40. Embedded Systems
41. Embedded Systems Technologies

7. SYLLABUS FOR WRITTEN TEST.

The entrance test shall consist of 100 multiple choice questions. There shall be no negative marking. 50 questions shall be based on Research Aptitude/Methodology which shall include quantitative methods/computer applications, experimental techniques etc. and 50 questions shall be subject specific. The test shall be of TWO hours.

Part A Research Aptitude/Methodology: Common to all departments

Unit-1 Research Aptitude

- Research: Meaning, Types, and Characteristics, Positivism and Post-positivist approach to research.
- Methods of Research: Experimental, Descriptive, Historical, Qualitative and Quantitative methods.
- Steps of Research.

- Thesis and Article writing: Format and styles of referencing.
- Application of ICT in research.
- Research ethics.

Unit-2 Comprehension & Communication

- A passage of text be given. Questions be asked from the passage to be answered.
- Communication: Meaning, types and characteristics of communication.
- Effective communication: Verbal and Non-verbal, Inter-Cultural and group communications, Classroom communication.
- Barriers to effective communication.
- Mass-Media and Society.

Unit-3 Mathematical Reasoning and Aptitude

- Types of reasoning.
- Number series, Letter series, Codes and Relationships.
- Mathematical Aptitude (Fraction, Time & Distance, Ratio, Proportion and Percentage, Profit and Loss, Interest and Discounting, Averages etc.) Unit-VI Logical Reasoning
- Understanding the structure of arguments: argument forms, structure of categorical propositions, Mood and Figure, Formal and Informal fallacies, Uses of language, Connotations and denotations of terms, Classical square of opposition.
- Evaluating and distinguishing deductive and inductive reasoning.
- Analogies.
- Venn diagram: Simple and multiple use for establishing validity of arguments.

Unit-4 Data Interpretation

- Sources, acquisition and classification of Data.
- Quantitative and Qualitative Data.
- Graphical representation (Bar-chart, Histograms, Pie-chart, Table-chart and Line-chart) and mapping of Data.
- Data Interpretation.
- Data and Governance.

Unit-5 Information and Communication Technology (ICT)

- ICT: General abbreviations and terminology.
- Basics of Internet, Intranet, E-mail, Audio and Video-conferencing.
- Digital initiatives in higher education.
- ICT and Governance.

NOTE: (i) Equal number of questions are to be set from each Unit.

(ii) Whenever graphical/pictorial question(s) are set for sighted candidates, a passage followed by equal number of questions and weightage be set for visually impaired candidates.

Part B: Department Specific Subject:

Unit 1: Engineering Mathematics

Linear Algebra: Vector space, basis, linear dependence and independence, matrix algebra, eigen values and eigen vectors, rank, solution of linear equations – existence and uniqueness.

Calculus: Mean value theorems, theorems of integral calculus, evaluation of definite and improper integrals, partial derivatives, maxima and minima, multiple integrals, line, surface and volume integrals, Taylor series.

Differential Equations: First order equations (linear and nonlinear), higher order linear differential equations, Cauchy's and Euler's equations, methods of solution using variation of parameters, complementary function and particular integral, partial differential equations, variable separable method, initial and boundary value problems.

Vector Analysis: Vectors in plane and space, vector operations, gradient, divergence and curl, Gauss's, Green's and Stoke's theorems.

Complex Analysis: Analytic functions, Cauchy's integral theorem, Cauchy's integral formula; Taylor's and Laurent's series, residue theorem.

Numerical Methods: Solution of nonlinear equations, single and multi-step methods for differential equations, convergence criteria.

Probability and Statistics: Mean, median, mode and standard deviation; combinatorial probability, probability distribution functions - binomial, Poisson, exponential and normal; Joint and conditional probability; Correlation and regression analysis.

Unit 2: Networks, Signals and Systems

Network solution methods: nodal and mesh analysis; Network theorems: superposition, Thevenin and Norton's, maximum power transfer; Wye-Delta transformation; Steady state sinusoidal analysis using phasors; Time domain analysis of simple linear circuits; Solution of network equations using Laplace transform; Frequency domain analysis of RLC circuits; Linear 2-port network parameters: driving point and transfer functions; State equations for networks.

Continuous-time signals: Fourier series and Fourier transform representations, sampling theorem and applications; Discrete-time signals: discrete-time Fourier transform (DTFT), DFT, FFT, Z-transform, interpolation

of discrete-time signals; LTI systems: definition and properties, causality, stability, impulse response, convolution, poles and zeros, parallel and cascade structure, frequency response, group delay, phase delay, digital filter design techniques.

Unit 3: Electronic Devices

Energy bands in intrinsic and extrinsic silicon; Carrier transport: diffusion current, drift current, mobility and resistivity; Generation and recombination of carriers; Poisson and continuity equations; P-N junction, Zener diode, BJT, MOS capacitor, MOSFET, LED, photo diode and solar cell; Integrated circuit fabrication process: oxidation, diffusion, ion implantation, photolithography and twin-tub CMOS process.

Unit 4: Analog Circuits

Small signal equivalent circuits of diodes, BJTs and MOSFETs; Simple diode circuits: clipping, clamping and rectifiers; Single-stage BJT and MOSFET amplifiers: biasing, bias stability, mid-frequency small signal analysis and frequency response; BJT and MOSFET amplifiers: multi-stage, differential, feedback, power and operational; Simple op-amp circuits; Active filters; Sinusoidal oscillators: criterion for oscillation, single-transistor and op-amp configurations; Function generators, wave-shaping circuits and 555 timers; Voltage reference circuits; Power supplies: ripple removal and regulation.

Unit 5: Digital Circuits

Number systems; Combinatorial circuits: Boolean algebra, minimization of functions using Boolean identities and Karnaugh map, logic gates and their static CMOS implementations, arithmetic circuits, code converters, multiplexers, decoders and PLAs; Sequential circuits: latches and flip-flops, counters, shift-registers and finite state machines; Data converters: sample and hold circuits, ADCs and DACs; Semiconductor memories: ROM, SRAM, DRAM; 8-bit microprocessor (8085): architecture, programming, memory and I/O interfacing.

Unit 6: Control Systems

Basic control system components; Feedback principle; Transfer function; Block diagram representation; Signal flow graph; Transient and steady-state analysis of LTI systems; Frequency response; Routh-Hurwitz and Nyquist stability criteria; Bode and root-locus plots; Lag, lead and lag-lead compensation; State variable model and solution of state equation of LTI systems.

Unit 7: Communications

Random processes: autocorrelation and power spectral density, properties of white noise, filtering of random signals through LTI systems; Analog communications: amplitude modulation and demodulation, angle

modulation and demodulation, spectra of AM and FM, superheterodyne receivers, circuits for analog communications; Information theory: entropy, mutual information and channel capacity theorem; Digital communications: PCM, DPCM, digital modulation schemes, amplitude, phase and frequency shift keying (ASK, PSK, FSK), QAM, MAP and ML decoding, matched filter receiver, calculation of bandwidth, SNR and BER for digital modulation; Fundamentals of error correction, Hamming codes; Timing and frequency synchronization, inter-symbol interference and its mitigation; Basics of TDMA, FDMA and CDMA.

Unit 8: Electromagnetics

Electrostatics; Maxwell's equations: differential and integral forms and their interpretation, boundary conditions, wave equation, Poynting vector; Plane waves and properties: reflection and refraction, polarization, phase and group velocity, propagation through various media, skin depth; Transmission lines: equations, characteristic impedance, impedance matching, impedance transformation, S-parameters, Smith chart; Waveguides: modes, boundary conditions, cut-off frequencies, dispersion relations; Antennas: antenna types, radiation pattern, gain and directivity, return loss, antenna arrays; Basics of radar; Light propagation in optical fibers.

6.1.3 DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING (MAIN CAMPUS)

1. The Department

The Department of Computer Science & Engineering, Netaji Subhas University of Technology (formerly Netaji Subhas Institute of Technology) was established in the year 1983. All through its sparkling history of 38 years, the department of CSE (formerly Division of Computer Engineering) has been known for its highly dynamic and application oriented strong Under-Graduate, Post-Graduate and Research programmes which cater the need academically as well socially at large.

The Department has always been on a progressive path, thanks to the experienced and dedicated faculty members who have a strong commitment towards providing quality engineering education and research. The Department has 24 faculty members, 07 Professors, 06 Associate Professors, 10 Assistant Professors and 01 visiting professors and most of the faculty members are Doctoral degree holders. The department works in consonance with the vision and mission of the University.

2. Courses Offered

The Department offers 04 Undergraduate (UG), 01 Postgraduate (PG) programme and Ph.D. Programmes. PG program M.Tech. (Computer Engineering) is for regular candidates of two years duration and for working professionals of three years duration. The UG programme B.E. Computer Engineering was started in 1983, right from the inception of the Institute. The first PG programme in COE was started in the year 1999. UG programme B. Tech. programme in Computer Science and Engg. (Artificial Intelligence) has commenced from the session 2019-20. B. Tech. programme in Computer Science and Engg. (Data Science) has been opened for admission from 2020-21. In addition, the Department also offers high quality research programmes at the doctoral level.

To keep in pace with the current technological advancements, the UG curriculum has been recently modified so that the students get exposure of what exactly is happening outside in the tech-world.

- B.Tech.-Computer Engineering (180 students through Choice Based Credit System.)
- B.Tech. – Computer Science and Engineering (Artificial Intelligence) (120 students Choice Based Credit System.)
- B.Tech. – Computer Science and Engineering (Data Science) (60 students Choice Based Credit System.)
- B. Tech. – Mathematics and Computing (75 students Choice Based Credit System.) – This is joint program being conducted by the Department of Computer Science & Engg. and Department of Mathematics.
- M.Tech.–Computer Engineering. (30 students- Four Semesters - Choice Based Credit System.)
- Doctor of Philosophy(Ph.D.)

3. Areas of Research and available vacancies

Our research capabilities provide solutions for clients and partners in a wide range of sectors including those listed below.

- **Artificial Intelligence**

Soft computing, machine learning, expert system, recommender

system, natural language processing, sentiment emotion analysis, pattern recognition, computer vision.

- **Computer Networking**

Cloud computing, mobile computing, broadcasting, wireless sensor networks, semantic web, social network analysis, watermarking, network security, Internet of things, topic modelling, image processing, Graph Analytics

- **Data Science**

Databases, data mining, data warehousing, big data analytics, Bio- informatics.

- **Educational Software**

Computational pedagogy, e-learning, instructional software, modeling and simulation, data visualization, human-computer interaction.

- **Software Engineering**

Software testing, software quality, software metrics.

3.1 Tentative Seats:

For the session 2022-23 (Even semester) the maximum number of seats in the department of CSE (Main Campus) are limited to

- (i) **Vacancies with university fellowship :07**
- (ii) **Vacancies without university fellowship :01**

S. No.	Area of Research	Faculty	No. of candidates to be taken in coming session	
			With Univ. Fellowship	Without Univ. Fellowship
1.	Data Science	Dr. Sushma Nagpal	F01	Nil
2.	Data Science	Dr. MPS Bhatia	01	01

3.	Computer Networking	Dr. Vandana Bhatia	01	Nil
4.	Computer Networking / Artificial Intelligence	Dr. Abhinav Tomar	01	Nil
5.	Computer Networking / Artificial Intelligence	Dr. Bijendra Kumar	01	Nil
6.	Computer Networking / Artificial Intelligence	Dr. Gaurav Singal	01	Nil
7.	Computer Networking / Artificial Intelligence	Dr. Rudresh Dwivedi	01	Nil
Total			07	01

4. Faculty Profile

4.1 Dr. Bijendra Kumar

1. Designation, Qualifications: Professor & Head Computer Science & Engg. Department, Ph.D., B.Tech.CSE
2. Areas of Interest: Video broadcasting, wireless sensor networks, cloud computing, networking, security, soft computing, machine learning, image processing, algorithms, Bioinformatics, watermarking, IOT.
3. Email: bizender@nsut.ac.in
4. Phone: +911125000156
5. Home Page: <http://www.nsut.ac.in/faculty/bks/>
6. List of Publications:



1. Satish Chand, Bijendra Kumar, and Hari Om, "Request based Data Delivery in Video-on Dem Services", Journal of IEEE

- Transactions on Consumer Electronics, Vol. 52(4), pp. 1318-1324, Nov. 2006.[SCI]
2. RiturajSoni, Bijendra Kumar, Satish Chand, “Optimal feature and classifier selection for text region classification in natural scene images using Weka tool”. Science Direct International Journal Multimedia Tools & Applications 78, 31757–31791 (2019). <https://doi.org/10.1007/s11042-019-07998-z> [SCIE].
 3. Divya Chaudhary, Bijendra Kumar, “Cost optimized Hybrid Genetic-Gravitational Search Algorithm for load scheduling in Cloud Computing”, ScienceDirect International Journal of Applied Soft Computing, Elsevier, <https://doi.org/10.1016/j.asoc.2019.105627> online since July 2019 [SCIE]
 7. Bio-Sketch: Dr. Bijendra Kumar is a Professor at the Division of Computer Engineering, Netaji Subhas University of Technology, and New Delhi. He has published several research papers in reputed International Journals including SCI/SCIE, International and National Conferences, and book chapters. He has research and teaching experience of 24 years. He has reviewed a number of research articles in reputed international journals. He had served many years in Institute / University admission committee. He was assigned the charge of practical superintendent. He has worked as warden of the Boys hostel. He has worked as the superintendent of theory examination. Besides these, he has been opted as members Board of Studies of other Universities, technical advisor in international conferences and in several other committees. Presently, he is the Head of Computer Science & Engineering department.

4.2 Dr. Sangeeta Sabharwal

- 1 Designation, Qualifications: Professor, Ph.D.
- 2 Areas of Interest: Software Engineering, Software Testing, Software Quality, Object Oriented Analysis, Soft Computing, Data Warehouse, Recommender Systems, Requirements Engineering
- 3 E-mail: ssab@nsut.ac.in
- 4 Phone: 011-25000177
- 5 Home Page: <http://www.nsit.ac.in/faculty>



6 List of Publications:

- a. Manuj Aggarwal, Sangeeta Sabharwal, “Combinatorial Test Set Prioritization Using Data Flow Techniques”, Arab J Sci Eng (2017). DOI 10.1007/s13369-017-2631-y, Springer
- b. Gargi Aggarwal, Sangeeta Sabharwal, Sushama Nagpal, “Theoretical and Empirical Validation of Coupling Metrics for Object-Oriented Data Warehouse Design,” Arab J Sci Eng (2017). doi.org/10.1007/s13369-017-2692-y, Springer
- c. GosainA., NagpalS., SabharwalS., “Validating dimension hierarchy metrics for the underst and ability of multidimensional models for data warehouse”, IET Software, Volume 7(2), 2013, pp 93-103.

7 Bio-Sketch: Dr. Sangeeta Sabharwal is a Professor in Division of Computer Engineering, Netaji Subhas University of Technology, and a premier university under Delhi Government. She has more than thirty four years of industrial and teaching experience and has been teaching subjects in the area of Software engineering, Object Oriented Analysis, Testing and Compiler design to UG and PG students. She has published more than hundred papers in reputed journals and conferences. Several students have completed their Ph.D. under her guidance and many more are pursuing their research under her guidance. She has also written books on Software Engineering. Her areas of interest are Requirements Engineering, Object Oriented Analysis and Design, Software Testing, Meta modeling, Data Warehouse, Soft Computing, Recommender systems. She is a Fellow of IETE and Senior member of IEEE and ACM.

4.3 Dr. Sushama Nagpal

1. Designation, Qualifications: Professor, Ph.D.
2. Areas of Interest: Software Quality Measurement, Data Warehouse, Data Mining/Machine Learning, Social Network Analysis and Recommender Systems
3. E-mail: sushmapriyadarshi@yahoo.com
4. Phone: 011-250000160
5. Home Page: <http://www.nsit.ac.in/faculty/sun/>
6. List of Publications:



- a. G Aggarwal, S Sabharwal, S Nagpal, “Theoretical and Empirical Validation of Coupling Metrics for Object-Oriented Data Warehouse Design”, Arabian Journal for Science and Engineering (Springer), 43(2), pp 675-691, 2018
 - b. Sambhav Yadav, Vikesh Kumar, Shreyam Sinha, Sushama Nagpal, “Trust aware recommender system using swarm intelligence”, J. Comput. Science (Elsevier) 28: 180-192(2018)
 - c. Anjana Gosain, Sushama Nagpal, Sangeeta Sabharwal, “Validating dimension hierarchy metrics for the underst and ability of multidimensional models for data warehouse” IET software 7 (2), 93-103.
7. Bio-Sketch: Dr. Sushama Nagpal is currently working as Professor in the Division of Computer Engineering at NSUT, New Delhi .She did her B.E.in Computer Science and Engineering from C. R. State College of Engineering, Murthal (Now DCRUST, Murthal). She obtained her M.Tech and Ph.D. degree from University of Delhi. She has almost 20 years of experience in teaching and has actively engaged herself in research. Her areas of interests include Software Quality Measurement, Data Warehouse, Data Mining/Machine Learning, Social Network Analysis and Recommender Systems. She has published various research papers in reputed international journals and conferences. She has reviewed number of research articles for reputed international journals and acted as Member, Technical Programme Committee for international conferences.

4.4 Dr. ShampaChakraverty

1. Designation, Qualifications: Professor, Ph.D., M.Tech,B.E
2. Areas of Interest: Machine Learning &Soft Computing, Natural Language Processing& Metaphor Processing, Trust and Security, Machine Learning, Sentiment and emotion analysis, Cross Domain Recommender systems, Computational Pedagogy.
3. Email:apmahs.nsit@gmail.com
4. Phone: 011-9899568694
5. Home Page:http://www.nsit.ac.in/faculty/spc/
6. List of Publications:



- a. Sunny Rai, ShampaChakraverty, Devendra Tayal, Divyanshu Sharma, Ayush Garg, “Understanding metaphors using emotions,” Journal of New Generation Computing, Springer Nature, print version: January 2019, Volume 37, Issue 1, pp 5–27, ISSN: 0288-3635, First online: 11 Sept 2018,ISSN:1882-7055.
 - b. Mala Saraswat, ShampaChakraverty, Enriching Topic Coherence on Reviews for Cross-Domain Recommendation, The Computer Journal, Published by Oxford Academic, bxaa008, <https://doi.org/10.1093/comjnl/bxaa008>.
 - c. Sunny Rai and ShampaChakraverty (2020). A Survey on Computational Metaphor Processing. ACM Computing Surveys, Vol 53, No. 2, Article 24 (May 2020), 37 pages, Published by Association for Computing Machinery, NY-USA, DOI:<https://doi.org/10.1145/3373265>.
7. Bio-Sketch: Dr.ShampaChakraverty is a Professor at the Division of Computer Engineering, Netaji Subhas University of Technology (formerly Netaji Subhas Institute of Technology), New Delhi. Dr. Chakraverty has published more than 110 research papers in reputed International journals, Proceedings of International and National Conferences, and two books. She has lectured extensively in various forums, including keynote lectures, EDUSAT program, IGNOU and radio programs on science and technology. She is a recipient of ISTE Raja ram Badu Patel National Award for Creative Work Done in Technical Education, 2008 and Prof. Indira Parikh award for 50 Women-in-Education Leaders, 2018.

4.5 Dr. MPS Bhatia

1. Designation, Qualifications: Professor, Ph.D.
2. Areas of Interest: Data Mining/Machine Learning, Social Network Analysis , Software Engineering, Semantic Web, Security, Social Network Analysis, Pattern Recognition, Computer Vision, Big Data Analytics, Bioinformatics.



3. Email: mpswhatia@nsit.ac.in
4. Phone: 011-250000160
5. Home Page: <http://www.nsit.ac.in/faculty/mps/>
6. List of Publications:
 - a. Geetika Sarna and Dr. M.P.S. Bhatia, "Content based approach to find the credibility of user in social networks: An application of cyberbullying", International Journal of Machine Learning and Cybernetics, Springer, November 2015. SCI-(doi.org/10.1007/s13042-015-0463-1)
 - b. Bhatia M.P.S., Kumar A. (2009) "Contextual Paradigm for Ad-hoc Retrieval of User-Centric Web-Data", IET Software, Vol. 3, No. 4, 264-275, DOI: 10.1049/iet-sen.2008.0015, ISSN (Print): 1751-8806, ISSN (Online): 1751- 8814.[SCIE]
 - c. M P S Bhatia, Venu and Pravin Chandra, "A New Weight Initialization Method for Sigmoidal FFANN", International Conference on Signals, Machines and Automation, SIGMA 2018, held in Feb, 2018. Published in Journal of Intelligent & Fuzzy Systems, IOS Press, Netherlands, pp 5193-5201, Nov 2018. DOI: 10.3233/JIFS-169803
7. Bio-Sketch: He is Ph.D. in computer engineering with more than twenty years of teaching and research experience. He has research experience spans the areas of software engineering, analytics, machine learning, security, social area network analysis, and pattern recognition and computer vision. He has published papers in reputed international conferences/journals and contributed book chapters. He has guided several Master thesis and Ph.D. thesis. He has reviewed number of research articles for reputed international journals and acted as Member, Technical Programme Committee for international conferences.

4.6 Dr. Pinaki Chakraborty

1. Designation, Qualifications: Assistant Professor, Ph.D.
2. Areas of Interest: System software, educational software, impact of computer on society.
3. Email: pinaki_chakraborty_163@yahoo.com
4. Phone: 011-25000102
5. Home Page: <http://www.nsit.ac.in/faculty/p:>



6. List of Publications:
 - a. Gupta, T., Yadav, S., Chakraborty, P., “Compiler Bootstrapping and cross-compilation”, Current Science, vol. 112, no. 5, pp. 906-907, 2017.
 - b. Joseph, D., Kaur, G., Chakraborty, P., “An exercise on hardware/software code sign following the RISC model”, Computer Applications in Engineering Education, vol. 24, no. 2, pp. 305-312, 2016.
 - c. Chakraborty, P., Saxena, P.C., Katti, C.P., “Fifty years of automata simulation: A review”, ACM Inroads, vol. 2, no. 4, pp. 59-70, 2011.
7. Bio-Sketch: Dr.Chakraborty is an assistant professor at the Division of Computer Engineering, Netaji Subhas University of Technology, New Delhi. His area of research includes compiler construction, operating systems, educational software, human-computer interaction and impact of computer on society. He has published more than 50 papers in reputed journals and conference proceedings. He is an associate editor of the journal Computer Applications in Engineering Education.

4.7 Dr. Anand Gupta

1. Designation, Qualifications: Associate Professor, Ph.D
2. Areas of Interest: Information Retrieval, Data Mining, Image Processing and Computer Vision
3. Email: anand.gupta@nsut.ac.in
4. Phone: 011-25000181
5. Home Page: <http://www.nsit.ac.in/faculty/ag/>
6. List of Publications:
 - a. Hardee Kumar Thakur, Anand Gupta, Ayesha Bhardwaj, Devanshi Verma: Rumor Detection on Twitter Using a Supervised Machine Learning Framework. IJIRR 8(3): 1-13 (2018).
 - b. Anand Gupta, Sagorika Das, Tarasha Khurana, Kamakshi Suri: Prediction of Lung Cancer from Low-Resolution Nodules in CT-Scan Images by using Deep Features. ICACCI 2018: 531-537



- c. Rajeev Kumar, Anand Gupta, Apoorv Gupta, Aman Bansal: Image Contrast Enhancement Using Hybrid Elitist Ant System, Elitism-Based Immigrants Genetic Algorithm and Simulated Annealing. CVIP (1) 2017: 115- 129

7. Bio-Sketch: Dr. Anand Gupta is an Associate Professor at the Division of Computer Engineering, Netaji Subhas University of Technology (formerly Netaji Subhas Institute of Technology), New Delhi. Dr Gupta has guided 2 PhD Theses and more than 10 M. Tech theses. He has published more than 50 research papers in reputed International journals, Proceedings of International and National Conferences. His research interest include Data Mining, database system, Image Processing and Information Retrieval.

4.8 Dr. Swati Aggarwal (On Leave upto 2023)

1. Designation, Qualifications: Assistant Professor, Ph.D
2. Areas of Interest: Artificial Intelligence, Machine Learning, Brain Computer Interface, Cognitive Computing, Data Science.
3. Email: swati1178@gmail.com
4. Phone: 9717995716
5. Home Page: <http://www.nsit.ac.in/faculty/swa/>
6. List of Publications:
 - a. Ansari, A. Q., Biswas, R., & Aggarwal, S. (2013). "Neutrosophic classifier: An extension of fuzzy classifier. Applied Soft Computing", 13(1), 563-573..
 - b. Sawhney, R., Manchanda, P., Singh, R., & Aggarwal, S. (2018) "A computational approach to feature extraction for identification of suicidal ideation in tweets". In Proceedings of ACL 2018, Student Research Workshop (pp.91-98).
 - c. Jain, S., Verma, S., Kumar, S., & Aggarwal, S. (2018, July). "An evolutionary learning approach to play Othello using XCS". In 2018 IEEE Congress on Evolutionary Computation (CEC) (pp. 1-8).IEEE
7. Bio-Sketch: Dr. Swati Aggarwal is Assistant Professor at the Division of Computer Engineering, Netaji Subhas University of Technology (formerly Netaji Subhas Institute of Technology), New Delhi. She has guided 10 M.Tech theses. She has published more than 40 research papers published in reputed



International Journals, Proceedings of International and National Conferences and book chapters. She has been awarded twice by IEEE- Computational Intelligence Society for her webinars on Fuzzy Logic and Big Data. Also She has been acknowledged and certified by Neutrosophic Science International Association for her distinguished achievements in the domain of Neutrosophic Logic and has been conferred an honorary membership.

Her research areas are Artificial Intelligence, Machine Learning, Brain Computer Interface, Cognitive Computing and Data Science. She is an avid learner and likes to experiment, address and provide solutions to the various societal issues in her research works.

4.9 Dr. Satbir Jain

1. Designation, Qualifications: Professor, Ph.D, M.Tech.
2. Areas of Interest: Artificial intelligence, networking and databases.
3. Email: jain_satbir@yahoo.com
4. Phone: +919873192577
5. Home Page: <http://www.nsit.ac.in/faculty/stj/>
6. List of Publications:
 - a. Deepali Virmani, Satbir Jain. “Virtual Nodes for Self Stabilization in Wireless Sensor Networks”, International Conference on Advances in Information and Communication Technologies, pp 371-375,2010,
 - b. Deepali Virmani, Savneet Kaur and Satbir Jain, “A Novel Framework for Intelligent Retrieval in Wireless Sensor Networks”, Elsevier ERCICA 2104, PP. 1-5.
 - c. Deepali Virmani and Satbir Jain, “An Efficient Hybrid Localization Technique in Wireless Sensor Networks”, IEEE Explore DOI 80.21.13/ ICRDPET 2013.4809182, 2013, PP. 1179-1186.
7. Bio-Sketch: Prof. Jain is a Professor at the Division of Computer Engineering, Netaji Subhas University of Technology (formerly Netaji Subhas Institute of Technology), New Delhi. Prof. Jain has guided 5 Ph.D. thesis and more than 25 M. Tech. dissertations. He has published more than 40 research papers in reputed International Journals, Proceedings of International



and National Conferences. His research interests are in the areas of Artificial Intelligence, Networking and Database.

4.10 Dr. Veenu

- 1 Designation: Associate Professor
- 2 Qualifications: MSc.(Computer Science Software, M. Tech.(IT), PhD
- 3 Areas of Interest: Soft computing, Machine learning, Artificial Neural Networks.
- 4 Email: veenu.d@rediffmail.com
- 5 Phone: +919810198358
- 6 Home Page: <http://www.nsit.ac.in/faculty/vee/>
- 7 List of Publications:



- a. Veenu and Pravin Chandra, "Training of sigmoidal FFANN using zero weight initialization and Gaussian learning rates", "International Conference on Computer Technology and Science", ICCTS 2012, held on 18-19 August, 2012. Published in IPCSIT, Peer reviewed referred journal with ISSN no. 2010-460X , Volume 47(2012), pp 29-33, IACSIT press, Singapore, 2012. DOI: 10.7763/IPCSIT.2012.V47.6
- b. Veenu, M P S Bhatia and Pravin Chandra, "Feasibility of Training and Investigation into Training of Sigmoidal FFANN with Gaussian Learning Rate and Zero weight Initializations", Published in ACEEE International Journal on Recent Trends in Engineering and Technology (IJRTET), a peer reviewed ACEEE journal with ISSN no. 2158-5563 (online), Volume 11, issue 1, pp 10-18, July 2014. <http://ijrtet.theaceee.org>. DOI: 01.IJRTET.11.1.1483
- c. M P S Bhatia, Veenu and Pravin Chandra, " Impact of Weight Initialization on Training of Sigmoidal FFANN", Towards Extensible and Adaptable Methods in Computing , TEAMC 2018, held in March, 2018. Published in ICTACT Journal on Soft Computing, vol. 08, issue 03, pp 1692-1695, April 2018. DOI: 10.21917/ijsc.2018.0236

- 7 **Bio-Sketch:** Ms. Veenu is Associate Professor in the Department of Computer Engineering. She obtained M.Sc. in

Computer science software from DAVV, Indore in 1996. She qualified UGC- NET in 1998. She received M.Tech.(IT) from USICT, GGSIPU, New Delhi in 2012. Presently she is pursuing Ph.D. (Computer Engineering) from Delhi University .She joined NSIT in The Department of Computer Engineering in 1998 as lecturer. Before joining NSIT, she worked as lecturer in SOS in Computer Science and Applications, Jiwaji University, Gwalior for appr. Two years on contract. She is now holding the post of Associate Professor. She is lifetime member of ISTE. She has number of publications in International journals and conferences. She is working in the area of artificial neural networks. She has taught number of subjects in past 21 years.

4.11 Ms. Savita Yadav

- 1 Designation, Qualifications: Assistant Professor ,M.Tech (CSE), Ph.D.(Pursuing)
- 2 Areas of Interest: Human Computer Interaction(HCI)
- 3 Email:
savitaydv@yahoo.com, savitaydv16@gmail.com
- 4 Phone:9968077734
- 5 Home Page:<http://www.nsit.ac.in/faculty/sy/>
- 6 List of Publications:
 - a. Yadav, S. and Chakraborty, P. 2017a. Video-chatting with young children. Current Science, 113(1):9-9.
 - b. Yadav, S. and Chakraborty, P. 2017b. Children aged two to four are able to scribble and draw using a smartphone app. Acta Paediatrica, 106(6): 991- 994.
 - c. Yadav, S. and Chakraborty, P. 2018a. Smartphone apps can entertain and educate children aged two to six but should be used with caution. Acta Paediatrica, 107(10):1834-35.
- 7 **Bio-Sketch:** Savita Yadav has been working in the division of computer engineering since 2007. Her research interest includes areas like Human Computer Interaction, Child Smartphone Interaction.



4.12 Mr. Khushil Kumar Saini

1. Designation, Qualifications: Associate Professor, M. Tech., PhD Pursuing
2. Areas of Interest: Computer Architecture, Information Security
3. Email:khushil@nsut.ac.in
4. Phone:9205475062
5. Home Page:<http://www.nsut.ac.in/faculty/kss/>
6. List of Publications:



- a. Disha, Khushil Saini "A review on Video steganography techniques in spatial domain", Proceedings of 2nd International Conference on Recent Developments in Control, Automation & Power Engineering (RDCAPE 2017), Noida, UP, India, 26- 27 October 2017, pp. 367-371, DOI:10.1109/RDCAPE.2017.8358298
 - b. Neha Singla, Khushil Kumar Saini, "An Efficient and Secure Steganography Technique Using Edge Adaptive Technique", International Journal of Computer Sciences and Engineering, Vol. 6, Issue 5, May 2018,pp.766-772
 - c. Akshika Verma, Khushil Kumar Saini, "Refined Neighbor Mean Interpolation Algorithm for Reversible Data-Hiding Techniques", Proceedings of the 13th INDIACom; 2019 6th International Conference On Computing For Sustainable Global Development, Bharati Vidyapeeth's Institute of Computer Applications and Management (BVICAM), New Delhi (INDIA), 13-15 March 2019, pp.803-807
7. Bio-Sketch: Khushil Kumar Saini is an Assistant Professor in Department of Computer Engineering. He completed his M. Tech in Computer Technology from IIT Delhi in Dec 2000.He has teaching experience of 17 years. His area of interest are Computer Architecture and Information Security.

4.13 Dr. Preeti Kaur

1. Designation, Qualifications: Associate Professor, M.tech., PhD
2. Areas of Interest: Software Engineering, Compiler Design
3. Email:
preetikaur1@rediffmail.com,preetikaurnsit@gmail.com



4. Phone:9899700263
5. Home Page: -<http://www.nsut.ac.in/faculty/ptk/>
6. List of Publications:
 - a. Sangeeta Sabharwal, Preeti Kaur, RituSibal. Applying Page Rank and HITS Algorithm to Identify Key Use Cases. Accepted in Journal of Applied Science and Engineering.2018.
 - b. Sangeeta Sabharwal, Preeti Kaur, RituSibal. Empirical and Theoretical Validation of a Use Case Diagram Complexity Metric. International Journal of Information Technology and Computer Science, 11, 2017, pp.35-47.
 - c. Preeti Kaur, RituSibal, Sangeeta Sabharwal. A User Story Based Approach to Measure System Complexity in Agile Software Development. International Journal of Control Theory and Applications, 10(8), 2017, pp.99-111.
7. Bio-Sketch: Preeti Kaur is working as an Associate Professor in the Division of Computer Engineering, NSUT. Having completed her masters (M.Tech. Information systems) from NSIT, she is currently pursuing Ph. D from University of Delhi and already submitted her thesis. She has an academic career of about 20 years. Her areas of interest are Software engineering, Requirements Engineering, Software Testing and Compiler Design. She has published various papers in international journals and conferences.

4.14 Dr. Poonam Rani

1. Designation, Qualifications: Associate professor, PhD(CSE) M Tech(CSE)
2. Areas of Interest: Artificial Intelligence, Block-chain, IoT, and Social network Analysis
3. Email: poonam.rani@nsut.ac.in, poonamrani2017.nsit@gmail.com
4. Phone:8882144367
5. Home Page: https://scholar.google.com/citations?user=_cDpLFAAAAAAJ&hl=en <http://sangam.nsut.ac.in/en/node/255>
6. List of Publications:
 - a) **Rani Poonam**, Tayal D, Bhatia MPS, “Sociocentric SNA on



Fuzzy Graph Social Network Model,” SOFT Computing, Springer, <http://doi.org/10.1007/s00500-022-06961-9>, March 2022, SCIE, IF-3.643

b) **Rani Poonam**, Jain V, Shokeen J, Balyan A (2022) "Blockchain-based rumor detection approach for COVID-19." Journal of Ambient Intelligence Humanized Computing, Springer, <https://doi.org/10.1007/s12652-022-03900-2>, May 2022, SCIE, IF-7.104

c) **Rani Poonam**, Preeti K, Jain V, Shokeen J, Nain S (2022b) "Blockchain-based IoT enabled health monitoring system," The Journal Supercomputing, Springer, <https://doi.org/10.1007/s11227-022-04584-3>, May 2022, SCIE, IF-2.474

7. **Biography**

Dr. Poonam Rani is an Associate Professor in the Computer Science and Engineering department at Netaji Subhas University of Technology (NSUT), formerly NSIT, Dwarka, New Delhi, India. She has done her Ph.D. in the Computer Engineering department at Delhi University, India, in Jan 2021. Her research interest includes Blockchain, IoT, Social networks Analysis, Soft Computing, and Machine learning. She has published several papers in reputed international journals including SCIE and international Scopus conferences and book chapters. She is invited as a Faculty Resource Person/Session Chair/Reviewer/TPC member in different FDP, conferences, and journals. She has reviewed several research articles in reputed international journals. Currently, she is a member of ISTE, IETE, and IEEE. She has worked in the timetable committee and admission committee. Besides all the above, she has worked as a member of several other committees. She is currently working as an Academic Officer of DTCRC (CSE) and as a Departmental Library coordinator. She has guided several B.Tech. and M.Tech. students in their major projects. She is also teaching and guiding Ph.D. students in the CSE department of NSUT.

4.15 Dr. Ritu Sibal

1. Designation, Qualifications: Professor, Ph.D., B.Tech. CSE
2. Areas of Interest: Software Engineering, Application of Soft Computing to Software Testing and Software Engineering, Software Security, Agile Software Development, AI,ML Design Engineering for Software Engineering.
3. Email: rsb@nsut.ac.in
4. Phone: +919871598390
5. Home Page:
6. List of Publications:



- a. S. Tyagi, R. Sibal and B. Suri, "Empirically developed framework for building trust in distributed agile teams", *Information and Software Technology (Elsevier)*, SCIE, Volume 145, 106828, May 2022. <https://doi.org/10.1016/j.infsof.2022.106828>
 - b. R. Sharma, R. Sibal and S. Sabharwal, "Software Vulnerability Prioritization using Vulnerability Description" *International Journal of System Assurance Engineering and Management (Springer)*, SCOPUS, July 2020. <https://doi.org/10.1007/s13198-020-01021-7>
 - c. S. Tyagi, R. Sibal, B. Suri, B. Wadhwa, and S. Shekhar, "Development of reusable hybrid test automation framework for web based scrum projects," *Journal of Applied Science and Engineering*, ESCI, SCOPUS, vol. 21, pp. 455–462, 2018 [https://doi.org/10.6180/jase.201809_21\(3\).0017](https://doi.org/10.6180/jase.201809_21(3).0017)
7. **Bio-Sketch:** Dr. Ritu Sibal is a Professor in the Division of Computer Science and Engineering, Netaji Subhas University of Technology, New Delhi. Her areas of interest include application of ML techniques in Software of Engineering and the Software testing, Large Scale Agile Software development: Challenges and strategies. She has published several research papers in national and international journals She has more than 30 years of teaching and research experience and has guided a number of Ph.D Thesis.

4.16 Dr. Abhinav Tomar

1. Designation, Qualifications: Assistant Professor, Ph.D

2. Areas of Interest: Wireless Rechargeable Sensor Networks, Decision Making, Computational Intelligence, Autonomous Vehicles, Service Selection and Task scheduling in Cloud Computing, Artificial Intelligence, Soft Computing, Intelligence in Edge/Fog Computing, Industrial IoTs, Recommender Systems, Nature-inspired Algorithms, Application of Deep Learning, Transfer Learning, Reinforcement Learning, and Federated Learning in various areas.



3. Email: abhinav.tomar@nsut.ac.in
profession.abhinav@gmail.com
4. Phone: 7073507233
5. Home Page:
<https://abhinavtomar.info>
6. List of Publications: (best three)
 - a. Tomar, Abhinav, Lalatendu Muduli, and Prasanta K. Jana. "A fuzzy logic-based on-demand charging algorithm for wireless rechargeable sensor networks with multiple chargers." **IEEE Transactions on Mobile Computing** 20, no. 9 (2020): 2715-2727 (**SCIE- IF:6.07**).
 - b. b.Anwit, Raj, Prasanta K. Jana, and Abhinav Tomar. "Sustainable and Optimized Data Collection via Mobile Edge Computing for Disjoint Wireless Sensor Networks." **IEEE Transactions on Sustainable Computing** (2021) (**SCIE-IF:4.90**).
 - c. Tomar, Abhinav, Lalatendu Muduli, and Prasanta K. Jana. "An efficient scheduling scheme for on-demand mobile charging in wireless rechargeable sensor networks." **Pervasive and Mobile Computing** 59 (2019): 101074 (**SCIE-IF:2.73**).

7. Bio-Sketch:

Abhinav Tomar received M.Tech. degree in Computer Science and Engineering from MNNIT Allahabad in 2014 and Ph.D. from Indian Institute of Technology (ISM) Dhanbad in 2020. Abhinav has about two years of teaching and five years of research experience in his career. He has authored or co-authored several research papers in reputed journals and conference proceedings. His research interests include

domain of Wireless Rechargeable Sensor Networks, Multi-attribute Decision Making, Cloud Service Selection and Task scheduling in Cloud Computing, Fuzzy Logic, Soft computing, Nature-inspired Algorithms, and Recommender Systems. As a recognition of his outstanding research contributions, he has been awarded the Young Researcher Award in 2020. He has also served as session chair and programme committee member of several International Conferences. He is a student member of ACM and IEEE (Computer Society, Sensors Council, Systems Council, etc.).

4.17 Dr. Geetanjali Rathee

1. Assistant Professor, Ph.D., M. Tech., B. Tech.
2. Areas of Interest: handoff security, cognitive networks, blockchain technology, resilience in wireless mesh networking, routing protocols, networking, and industry 4.0
3. Email: geetanjali.rathi@nsut.ac.in, geetanjali.rathee123@gail.com
4. Phone: 9736248186
5. Home Page:
6. List of Publications: (best three in your opinion in journals)
 - a. Rathee, G., Garg, S., Choi, B.J. and George, J., 2020, A Decision-Making Model for Securing IoT Devices in Smart Industries. *IEEE Transactions on Industrial Informatics* DOI: 10.1109/TII.2020.3005252 (Early Access).
 - b. Rathee, G., Ahmad, F., Iqbal, R. and Mithun, 2020, Cognitive Automation for Smart Decision Making in Industrial Internet of Things. *IEEE Transactions on Industrial Informatics* DOI: 10.1109/TII.2020.3013618.
 - c. Rathee, G., Jaglan, N., Garg, S., Choi, B.J. and Choo, K.K.R., 2020. A Secure Spectrum Handoff Mechanism in Cognitive Radio Networks. *IEEE Transactions on Cognitive Communications and Networking*, vol. 6, no. 3, pp. 959-969, DOI: 10.1109/TCCN.2020.2971703 (Early Access)
7. **Bio-Sketch:** Geetanjali Rathee is currently working as an Assistant Professor (Senior Grade) in the Department of Computer Science and Engineering with Jaypee University of



Information Technology (JUIT), Wagnaghat, Himachal Pradesh, since 2017 till today. She received her Ph.D. in Computer Science and Engineering from JUIT, in 2017. She has done her M.Tech in Computer Science and Engineering from JUIT, Wagnaghat, in 2014 and B. Tech. From B.M.I.E.T. under MDU, Rohtak in 2011. Her research interests include handoff security, cognitive networks, blockchain technology, resilience in wireless mesh networking, routing protocols, networking, and industry 4.0. She has published 06 national and international patents. She has approximately 10 transaction papers in IEEE with an impact factor of 9.1, and 8.0, 20 SCI papers in Springer and Elsevier journals with an impact factor of more than 2.0. In addition, she has published around 40 Scopus index journals and more than 15 publications in international and national conferences and book chapter. She has also published one book on “Large-Scale Data Streaming, Processing, and Blockchain Security” IGI Global, U.K. She is also a reviewer for various journals such as IEEE Transactions on Vehicular Technology, Wireless Networks, Cluster Computing, Ambience Computing, Transactions on Emerging Telecommunications Engineering, and the International Journal of Communication Systems.

4.18 Dr. Vandana Bhatia

1. Designation, Qualifications: Assistant Professor, Ph.D.
2. Areas of Interest: Machine Learning, Computer Vision, Big Data Analytics, Health informatics
3. Email: Vandana.bhatia@nsut.ac.in
4. Phone: 9467726510
5. Home Page:
6. List of Publications: (best three in your opinion in journals)
 - d. Bhatia, V., & Rani, R. (2019). A distributed overlapping community detection model for large graphs using autoencoder. Future Generation Computer Systems, 94, 16-26. <https://doi.org/10.1016/j.future.2018.10.045> Impact factor: 6.125
 - e. Bhatia, V., & Rani, R. (2018). Ap-FSM: A parallel algorithm for approximate frequent subgraph mining using Pregel.



Expert Systems with Applications, 106, 217-232.
<https://doi.org/10.1016/j.eswa.2018.04.010> Impact
factor: 5.452

- f. Bhatia, V., & Rani, R. (2018). Dfuzzy: a deep learning-based fuzzy clustering model for large graphs. Knowledge and Information Systems, 57(1), 159-181.
<https://doi.org/10.1007/s10115-018-1156-3> Impact
factor: 2.936

7. **Bio-Sketch:**

Dr. Vandana Bhatia has a demonstrated history of working in the higher education, industry and research and development. She is Strong research professional with a Doctor of Philosophy focused on Big Data, Machine Learning and Cluster Analysis. She has 20 research papers published in Journals and International conferences of high repute. She is reviewer of many scientific indexed Journals. Her area of interest includes Big Data Analytics, Machine Learning, Artificial Intelligence, and Computer Vision.

4.19 Dr. Rashmi Chaudhry

1. Designation, Qualifications: Assistant Professor, Ph.D
2. Areas of Interest: Internet of Things, Wireless Sensor Networks, Intelligent Transportation Systems.
3. Email: rashmi@nsut.ac.in, 27rashmichaudhry@gmail.com
4. Phone:
5. Home Page:
6. List of Publications:



- a. Chaudhry, Rashmi, Shashikala Tapaswi, and NeeteshKumar. "A green multicast routing algorithm for smart sensor networks in disaster management." *IEEE Transactions on Green Communications and Networking* 3.1 (2019): 215-226.
- b. Dwivedi, Sanjeev Kumar, Ruhul Amin, Satyanarayana Vollala, and Rashmi Chaudhry. "Blockchain-based secured event-information sharing protocol in internet of vehicles for smart cities." *Computers & Electrical Engineering* 86 (2020): 106719.
- c. Kumar, Neetesh, Rashmi Chaudhry, Omprakash Kaiwartya, Neeraj Kumar, and Syed Hassan Ahmed. "Green Computing

in Software Defined Social Internet of Vehicles." *IEEE Transactions on Intelligent Transportation Systems* (2020).

7. **Bio-Sketch:** Dr. Chaudhry is an assistant professor at Computer Science and Engineering Department, Netaji Subhas University of Technology, New Delhi. She has done M.Tech and PhD from ISM(IIT) Dhanbad and ABV-IIITM, Gwalior respectively. Prior to joining NSUT, Delhi, she was Assistant Professor in Dr. SPM IIIT Naya Raipur, India. Her area of research includes Computer Networks, Wireless Sensor Networks, Internet of Things and Intelligent Transportation Networks. She has published research papers in various reputed journals and conference proceedings.

4.20 **Mr. Rajeev Kumar**

1. Designation, Qualifications: Associate Professor, M.Tech
2. Areas of Interest: Cloud Computing
3. Email: Rajeev.kumar@nsut.ac.in
4. **Bio-Sketch** Sh. Rajeev Kumar is holding the position of Proctor, Dy Coordinator M.Tech.



Admissions and various other administrative portfolios. He is a key person who switched the offline admission process to the online admission process in association with the NIC. He is presently working in the area of cloud computing and security.

4.21 **Dr. Gaurav Singal**

- 1 Designation, Qualifications: Assistant Professor, Ph.D.
- 2 Areas of Interest: Internet of Things, Mobile Adhoc Networks, Applied Deep Learning, Reinforcement Learning
- 3 Email: gauravsingal789@gmail.com
- 4 Phone: 09413882576
- 5 Home Page:
- 6 List of Publications:
 - a. Gaurav Singal, V. Laxmi, M. S. Gaur and D V. Rao. 2016. "Moralism: mobility prediction with link stability based multicast routing protocol in MANETs." *Wireless Networks*, Springer, vol 23, no 3, PP 663–679.
 - b. Gaurav Singal, V. Laxmi, D V. Rao, M. S. Gaur, S. Todi, and R. Kushwaha "Multiconstraints Link Stable Multicast Routing



Protocol in Adhoc Networks." Ad Hoc Networks, ELSEVIER Volume 63, 2017, Pages 115-128, ISSN 1570-8705.

- c. S. Gupta, Gaurav Singal, D. Garg. "Deep Reinforcement Learning Techniques in Diversified Domains: A Survey.", Arch Computat Methods Eng, Springer, 2021 Feb 10:1-40.

7 **Bio-Sketch:** Dr. Gaurav Singal is an Assistant Professor at the Division of Computer Engineering, Netaji Subhas University of Technology, New Delhi. He obtained his Ph.D. and M. Tech. in Computer Science Engineering department from Malaviya National Institute of Technology, Jaipur, India. He received the research grants from Department of Science and Technology, Uttar Pradesh on women security and Department of Biotechnology on Assistive devices. He is actively working in research and teaching from last 9 years and published number of reputed conferences and journals (40+). He is the member of scientific society IEEE and ACM. He is a certified as a NVIDIA Deep learning institute ambassador and UIPath RPA Advanced Developer. His research interests include Internet of Things, Mobile Adhoc Networks, Edge computing, Deep leaning and Reinforcement Learning.

4.22 **Dr. Vijay Kumar Bohat**

- 1) Designation, Qualifications: Assistant Professor, Ph.D.
- 2) Areas of Interest: Computational Intelligence, Machine Learning, and Image Processing.
- 3) Email: vijay.bohat@gmail.com
- 4) Phone: 7999515174
- 5) Home Page:
- 6) List of Publications:

- a) Bohat, V. K., & Arya, K. V. (2019). A new heuristic for multilevel thresholding of images. Expert Systems with Applications, 117, 176-203.
- b) Bohat, V. K., & Arya, K. V. (2018). An effective gbest-guided gravitational search algorithm for real-parameter optimization and its application in training of feedforward neural networks. Knowledge-Based Systems, 143, 192-207.
- c) Rajput, S. S., Bohat, V. K., & Arya, K. V. (2019). Grey wolf



optimization algorithm for facial image super-resolution. Applied Intelligence, 49(4), 1324-1338.

- 7) Bio-Sketch: Dr. Bohat is an assistant professor at the Division of Computer Engineering, Netaji Subhas University of Technology, New Delhi. His area of research includes Computational Intelligence, Machine Learning, and Image Processing. He has published more than 10 papers in reputed journals and conference proceedings. He is a reviewer of reputed journals like Knowledge-based Systems, Expert System with Applications etc.

4.23 Dr. Renu Jain

1. Designation, Qualifications: Visiting Faculty, Ph.D.
2. Areas of Interest: Sentiment Analysis, Expert Systems, Natural Language Processing, Machine Learning
3. Email: renu.jain@nsut.ac.in
4. Phone: 9415045339
5. Home Page:
6. List of Publications:
 - a. Deepak Kumar Verma, Ashwani Kush, Renu Jain “Identifying Intruders in MANET: Exploiting RREP Message of AODV Protocol”, International Journal of Information Technology Project Management, vol11, issue 4, Oct-Dec 2020.
 - b. Alok Kumar, Renu Jain, “Faculty Evaluation System”, Procedia Computer Science 125 (2018) 533–541
 - c. D.R. Mishra & Renu Jain “PulsExpert: An Expert System for the Diagnosis and Control of Diseases in Pulse crops” published in the Journal: “Expert Systems With Applications”, Vol 38, issue 9, Sept, 2011



7. Bio Sketch:

a) Educational Qualifications:

Ph.D. (Computer Science): B.I.T.S. Pilani, 1996

Certificate in Computer Based Information System (Software Technology), McGill University, 1990

M.Sc. (Mathematics): IIT Delhi, 1982

b) Professional Experience:

Associate Professor: Department of Computer Science & Engineering, UIET, CSJM University, Kanpur, July 2002 – December 2020

Professor: Department of Comp. Sc. & Engineering, Krishna Girls Engineering College, Kanpur, July 2008 - August 2009.

Assistant Professor: Department of Computer Science & Engineering, UIET, CSJM University, Kanpur, July 1997 - July 2003

Senior Project Scientist: Department of Computer Science & Engg. IIT Kanpur, July 1993-July 1997

Lecturer: BITS Pilani, January 1991- June 1993

c) *Administrative Experience:*

Officiating Director, UIET, CSJM University, Kanpur
Director, Krishna Girls Engineering College, Kanpur
Dean of Engineering, CSJM University, Kanpur

Head, Deptt of Computer Sc & Engineering, UIET, CSJM University, Kanpur

d) *Copyright :PulsExpert: An Expert System for Identification and Control of Diseases/Insect-Pests in Pulse Crops* No: L-65177/2017 and Owner: ICAR - Indian Institute of Pulses Research, Kalyanpur, Kanpur Authors: Dr. Devraj and Dr. Renu Jain

e) *Ph.D. Supervision:* Supervised 6 Ph.D. Theses

f) *Other Academic Activities:* Supervised about 100 B.Tech. projects, Examined several Ph.D. Theses, Member of several RDCs of Technical Institutes, Chaired Conference Sessions, Coordinated conferences and workshops, Delivered several Invited Talks.

4.24 Dr. Rudresh Dwivedi

1. Designation, Qualifications: Assistant Professor, Ph.D.
2. Areas of Interest: Biometrics, Biometric security, Deep learning, Computer vision
3. Email: 1. rudresh.dwivedi@nsut.ac.in
rudresh.dwivedi@gmail.com
4. Phone: 9713888726
5. Home Page: <http://www.nsut.ac.in/faculty/rd1/>
6. List of Publications:



- A. R. Dwivedi, T. Dutta, Yu-Chen Hu, "A leaf disease detection mechanism based on L1-norm minimization extreme learning machine", *IEEE Geoscience and Remote Sensing Letters* (Accepted) 10.1109/LGRS.2021.3110287. [SCIE IF:]
 - B.R. Dwivedi, S. Dey, C. Chakraborty and S. Tiwari, "Grape Disease Detection Network Based on Multi-Task Learning and Attention Features," *IEEE Sensors Journal*, vol. 21, no. 16, pp. 17573-17580, 2021, doi: 10.1109/JSEN.2021.3064060. [SCIE IF:]
 - C.R. Dwivedi, S. Dey, M. Sharma, A. Goel, "A fingerprint based crypto-biometric system for secure communication", *Journal of Ambient Intelligence and Humanized Computing*, Springer, Vol. 11, pp. 1495–1509 (2020). <https://doi.org/10.1007/s12652-019-01437-5>. [SCIE IF: 7.104]
7. Bio-Sketch: Rudresh Dwivedi is currently working as an Assistant Professor in the Department of Computer Science & Engineering at Netaji Subhas University of Technology (formerly NSIT), Dwarka, Delhi. Earlier, he was working as an Assistant Professor in the Department of Computer Science & Engineering at Pandit Deendayal Energy University (formerly PDPU) Gandhinagar Gujarat. He received his M.Tech. from Electrical Engineering department (specialization in Computer Technology) and Ph.D. degree in Computer Science and Engineering from Department of Computer Science & Engineering, Indian Institute of Technology Indore, in 2013 and 2019, respectively. Thereafter, he was a Research Fellow for a

SERB-DST project entitled “Design and Development of Efficient Cancelable Template Generation Methods for Fingerprint and Iris Biometrics”. He has published over 20 research articles (including papers in international journals, conferences and book chapters). He is a recipient of the IDRBT Doctoral Colloquium in 2015. He is actively involved in academic and industrial collaboration for research and development.

5. Laboratory Infrastructure

The department of Computer Engineering has Database Lab, Computer Graphics Lab, CAD Lab, Samsung Innovation Lab (Sponsored by Samsung), General Computation Lab, Computer Architecture Lab, and one center of excellence for Virtual Reality. Besides nine labs are for common courses and in the library building. The department has a large number of machines with OS like windows, Ubuntu, Linux giving a homogeneous as well as heterogeneous environment to research scholars. Software’s like Rational Rose, Clementine, Matlab, LabVIEW, NS2, Glomosim, CloudSim, and Latex may be accessed directly or through the University Network. The center for excellence in virtual reality is also under consideration for further up-gradation. Besides, keeping in view the expansion of the department a few more labs are under proposal. Recently the department in the process of procurement of 240 new computers with latest configurations.

6 Eligibility with respect to Bachelors & Masters Degree.

List of Degrees in B.E. / B.Tech. considered for admission.

1. Artificial Intelligence
2. Computer & Communication Engineering
3. Computer and Information Science
4. Computer Engineering
5. Computer Engineering & Applications
6. Computer Science
7. Computer Science & Engineering
8. Computer Science & Information Technology
9. Cyber Forensics
10. Cyber Forensics and Information Security
11. Cyber Security
12. Information Technology
13. Information Technology & Engineering
14. Software Engineering

With M. Tech. specialization in any of the branches mentioned below.

1. Advanced Communication and Information System
2. Artificial Intelligence
3. Animation And Multimedia Technology
4. Computer & Communication Engineering
5. Computer Applications
6. Computer and Information Science
7. Computational Techniques
8. Computer Engineering,
9. Computer Engineering & Applications
10. Computer Networking
11. Computer Science
12. Computer Science & Engineering
13. Computer Science & Information Technology
14. Computer Technology & Applications
15. Computer Science & Technology
16. Computer Science and Systems Engineering
17. Computer Technology
18. Computing in Multimedia
19. Computing in Software
20. Cyber Forensics
21. Cyber Forensics and Information Security
22. Cyber Security
23. Distributed and Mobile Computing
24. Distributed Systems
25. Data Sciences
26. Information & Communication Technology,
27. Information Engineering
28. Information Science & Engineering
29. Information Science & Technology
30. Information Security
31. Information System
32. Information Technology
33. Information Technology & Engineering,
34. Mathematics & Computing,
35. Mobile & Pervasive Computing,
36. Multimedia and Software Engineering
37. Multimedia Technology
38. Network Engineering
39. Networking
40. Networking and Internet Engineering
41. Pervasive Computing Technology
42. Software Engineering
43. Software Systems
44. Software Technology
45. Software Testing
46. Web Designing

47. Web Technologies
48. Wired and Wireless Communication
49. Wireless and Mobile Communications
50. Wireless Communication & Computing
51. Wireless Communication Technology
52. Wireless Communications
53. Wireless Networks and Applications
54. Wireless Technology
55. 3-D Animation & Graphics
- 56.

7. SYLLABUS FOR WRITTEN TEST:

The entrance test shall consist of 100 multiple choice questions. There shall be no negative marking. 50 questions shall be based on Research Aptitude/Methodology which shall include quantitative methods/computer applications, experimental techniques etc. and 50 questions shall be subject specific. The test shall be of Two hours.

Part A Research Aptitude/Methodology:

Unit-1 Research Aptitude

- Research: Meaning, Types, and Characteristics, Positivism and Post-positivistic approach to research.
- Methods of Research: Experimental, Descriptive, Historical, Qualitative and Quantitative methods.
- Steps of Research.
- Thesis and Article writing: Format and styles of referencing.
- Application of ICT in research.
- Research ethics.

Unit-2 Comprehension & Communication

- A passage of text be given. Questions be asked from the passage to be answered.
- Communication: Meaning, types and characteristics of communication.
- Effective communication: Verbal and Non-verbal, Inter-Cultural and group communications, Classroom communication.
- Barriers to effective communication.
- Mass-Media and Society.

Unit-3 Mathematical Reasoning and Aptitude

- Types of reasoning.
- Number series, Letter series, Codes and Relationships.

- Mathematical Aptitude (Fraction, Time & Distance, Ratio, Proportion and Percentage, Profit and Loss, Interest and Discounting, Averages etc.) Unit-VI Logical Reasoning
- Understanding the structure of arguments: argument forms, structure of categorical propositions, Mood and Figure, Formal and Informal fallacies, Uses of language, Connotations and denotations of terms, Classical square of opposition.
- Evaluating and distinguishing deductive and inductive reasoning.
- Analogies.
- Venn diagram: Simple and multiple use for establishing validity of arguments.

Unit-4 Data Interpretation

- Sources, acquisition and classification of Data.
- Quantitative and Qualitative Data.
- Graphical representation (Bar-chart, Histograms, Pie-chart, Table-chart and Line-chart) and mapping of Data.
- Data Interpretation.
- Data and Governance.

Unit-5 Information and Communication Technology (ICT)

- ICT: General abbreviations and terminology.
- Basics of Internet, Intranet, E-mail, Audio and Video-conferencing.
- Digital initiatives in higher education.
- ICT and Governance.

NOTE: (i) Equal number of questions are to be set from each Unit.

(ii) Whenever graphical/pictorial question(s) are set for sighted candidates, a passage followed by equal number of questions and weightage be set for visually impaired candidates.

PART B Department Specific Subject:

UNIT -1

Engineering Mathematics: Discrete Mathematics: Propositional and first order logic. Sets, relations, functions, partial orders and lattices. Groups. Graphs: connectivity, matching, coloring. Combinatorics: counting, recurrence relations, generating functions. Linear Algebra: Matrices, determinants, system of linear equations, eigenvalues and eigenvectors, LU decomposition. Calculus: Limits, continuity and differentiability. Maxima and minima. Mean value theorem. Integration. Probability: Random variables. Uniform, normal, exponential, poisson and binomial distributions. Mean, median, mode and standard deviation. Conditional probability and Bayes theorem.

UNIT-2

Digital Logic: Boolean algebra. Combinational and sequential circuits. Minimization. Number representations and computer arithmetic (fixed and floating point).

UNIT-3

Computer Organization and Architecture: Machine instructions and addressing modes. ALU, data-path and control unit. Instruction pipelining. Memory hierarchy: cache, main memory and secondary storage; I/O interface (interrupt and DMA mode).

UNIT-4

Programming, Data Structures & Algorithms: Programming in C. Recursion. Arrays, stacks, queues, linked lists, trees, binary search trees, binary heaps, graphs. Searching, sorting, hashing. Asymptotic worst case time and space complexity. Algorithm design techniques: greedy, dynamic programming and divide-and-conquer. Graph search, minimum spanning trees, shortest paths.

UNIT-5

Theory of Computation: Regular expressions and finite automata. Context-free grammars and push-down automata. Regular and context-free languages, pumping lemma. Turing machines and undecidability.

UNIT-6

Compiler Design: Lexical analysis, parsing, syntax-directed translation. Runtime environments. Intermediate code generation.

UNIT-7

Operating System: Processes, threads, inter-process communication, concurrency and synchronization. Deadlock. CPU scheduling. Memory management and virtual memory. File systems.

UNIT-8

Databases: ER-model. Relational model: relational algebra, tuple calculus, SQL. Integrity constraints, normal forms. File organization, indexing (e.g., B and B+ trees). Transactions and concurrency control.

UNIT-9

Computer Networks: Concept of layering. LAN technologies (Ethernet). Flow and error control techniques, switching. IPv4/IPv6, routers and routing algorithms (distance vector, link state). TCP/UDP and sockets, congestion control. Application layer protocols (DNS, SMTP, POP, FTP, HTTP). Basics of Wi-Fi. Network security: authentication, basics of public key and private key cryptography, digital signatures and certificates, firewalls.

6.1.4 DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING (EAST CAMPUS)

1. The Department

The CSE department of NSUT East Campus (formerly IAICTR, Govt. of NCT of Delhi) has been established with the main motive to contribute significantly in the areas of teaching and research. The main objective of the department is to develop the latest computer based applications to serve the society in a better way. The curriculum of UG and PG programmes comprises of major areas such as Data Mining, Big Data Analytics, Machine Learning, Natural Language Processing and Artificial Intelligence, Web Semantics and Information Retrieval, Mobile Ad-hoc and Wireless Sensor Network, Computer Network and Information Security, Software Testing, Web Security Techniques, Data Warehousing, Software Engineering, Mobile Computing, Cloud Computing and Internet of Things.

The objective of the department is to prepare students with necessary core competencies to succeed in their career to serve the Nation for sustainable growth.

2. Courses Offered

The Department offers 02 Undergraduate (UG), 02 Postgraduate (PG) and Ph.D. Programmes. The UG programme (B.Tech. in Computer Science & Engg.) was started in 2001, right from the inception of the Institute. The first PG programme (M.Tech in Information Security) was started in the year 2007. B.Tech (CSE) with specialization in big data analytics has been started from the academic session 2020-21. Second UG programme (B.Tech in CSE with specialization in IOT) is being started from the academic session 2021-22. Another PG program (M.Tech in Artificial Intelligence) has been started from academic session 2021-22. Department also offers high quality research programmes at the doctoral level. To keep pace with the current technological advancements, the UG and PG curriculum have been recently modified. Following UG, PG and Ph.D. programmes are offered in CSE Department:

- B.Tech. in Computer Science and Engineering (Big Data Analytics) with intake of 60 students
- B.Tech. in Computer Science and Engineering (IoT) with intake of 60 students
- M.Tech. (Artificial Intelligence) with intake of 30 students
- M.Tech. (Information Security) with intake of 30 students

- Doctor of Philosophy (Ph.D.)

3. Areas of Research and available Vacancies

The faculty members are engaged in the various areas of research listed below:

- **Artificial Intelligence**

Natural Language Processing, Speech Processing, Sentiment analysis, Soft Computing, Information Retrieval, Deep Learning, Social Network Analysis, Big Data Analytics, Business Analytics, Business Intelligence, Stream Mining, Computational Techniques, Soft Computing

- **Machine Learning**

Internet of Things, Cloud Computing, Internet Technologies, Data Warehousing, Data Mining

- **Adhoc Networks**

Wireless Sensors Networks, Mobile Adhoc Networks, Vehicular Ad-hoc Network, Mobile Computing, Cloud Computing, Intelligent Computing, Internet of Things, Wireless Sensor Networks, Flying Ad-hoc Networks

- **Software Engineering**

Software Engineering, Requirements Engineering, Reverse Engineering, Software Testing, Security Testing

- **Information Security**

Wireless Network Security, Cyber Crime Investigation and Cyber Forensic, Text Processing for Information Security, Security Issues in Information System, Cryptography Foundation and its Applications, Security Testing, Intrusion Detection, Information Warfare, Security Testing, Blockchain

3.1 Tentative Seats:

For the session 2022-23 (Even semester) the maximum number of seats in the Department of CSE (East Campus) are limited to

i. Vacancies with university fellowship : 09

ii. Vacancies without university fellowship :04

University reserves the right to change the number of seats.

***The table below indicates the number of vacancies available in various areas of research. However, the total number of seats are as given above**

Sr. No.	Area of Research	Faculty	No. of candidates to be taken in coming session	
			With Univ. Fellowship	Without Univ. fellowship
1	Database, Advance Database, Data Warehouse and Data-Mining, Big Data, Social Network Mining, Collaborative Filtering, IoT	Prof. Vishal Bhatnagar	02	01
2	Data Warehousing, Software Engineering and Machine Learning, Deep Learning	Prof. Manoj Kumar	02	01
3	Data Mining, Web Engineering, Distributed Computing, Cloud Computing, IoT, Mobile Ad-hoc Network	Prof. Nanhay Singh	00	00

4	Information Retrieval, Semantic Web, Ontology Engineering, Machine Learning.	Dr. Suresh Kumar Poonia	02	00
5	Artificial Intelligence, Speech Processing, Information Security	Dr. Shobha Bhatt	02	02
6	Information Security, Big Data, Data Warehouse and Data Mining, IoT	Dr. Bharti Nagpal	01	00
7	Mobile Ad-hoc Networks, Vehicular Ad-hoc Network, Theory of computation	Dr. R S Rao	00	00
8	Natural Language Processing, Information Retrieval, Fuzzy logic, Artificial Intelligence, Data Science	Dr. Amita Jain	00	00
Total			09	04

4. Faculty Profile

4.1. Prof. Manoj Kumar

1. **Designation, Qualification:** Professor and Head, Ph.D., M.Tech., B.E.

2. **Area of Interest:** Data Warehouse, Security, Requirements Engineering, Software Engineering, Machine Learning, Deep Learning.

3. **Email:** manojkumar@aiactr.ac.in

4. **Phone:** +919717124559

5. **HomePage:** <http://aiactr.ac.in/index.php/academics/faculty-profile/cse-faculty-link/17-manoj-kumar>



6. Selected publications:

- a. Singh, T and Kumar, M. Investigating Requirements Completeness Metrics for Requirements Schemas Using Requirements Engineering Approach of Data Warehouse: A Formal and Empirical Validation, Arabian Journal for Science and Engineering, Springer, <https://doi.org/10.1007/s13369-021-06269-0>, 2021 **(SCIE)**
- b. Tomer, M and Kumar, M. Multi-document extractive text summarization based on firefly algorithm, Journal of King Saud University-Computer and Information Sciences, Elsevier, <https://doi.org/10.1016/j.jksuci.2021.04.004>, 2021 **(SCIE)**
- c. Tomer, M and Kumar, M. Improving Text Summarization using Ensemble Approach based on Fuzzy with LSTM, Arabian Journal for Science and Engineering, Springer, <https://doi.org/10.1007/s13369-020-04827-6>, 2020 **(SCIE)**

7. Bio-Sketch: Prof. Manoj Kumar completed B.E. (Computer Science and Engineering) in the year 1996 from Bipin Tripathi Kumaon Institute of Technology, An Autonomous Institute of Govt. of Uttarakhand (Formerly Kumaon Engineering College, Dwarahat). He completed M.Tech.(Information System) in the year 2003 from Netaji Subhas University of Technology (Formerly Netaji Subhas Institute of Technology, University of Delhi). He completed Ph.D.(Information Technology) in the year 2014 from Guru Gobind Singh Indraprastha University, Delhi. He has more than 24 years of teaching experience. He has published more

than 41 research papers in the International Journals and Conferences of repute. He has been supervising four Ph.D. research scholars registered with Guru Gobind Singh Indraprastha University (GGSIU), Delhi. He has been an expert member of various selection panels and committees constituted by Govt. of India. He has been reviewer for International Journals and Conferences of repute. He is a senior member of IEEE.

4.2 Prof. Vishal Bhatnagar



1. **Designation. Qualifications:** Professor, PhD
2. **Area of Interest:** Data Mining & Data Modeling, Web Mining, Data Analytics, Block Chain, IoT, Intelligent Information Retrieval, Social Network Analysis, Big Data Analytics, Business Analytics, Business Intelligence, Stream Mining, Computational Techniques, Block chain
3. **Email:** vishalbhatnagar@yahoo.com, vishal.bhatnagar@nsut.ac.in
4. **Phone Number:** 011-21210166
5. **Home Page:** <http://nsuteastcampus.aiacr.ac.in/index.php/faculty>
6. **Selected Publication:**
 - a. Bohra, N. and Bhatnagar, V. (2021), 'Group level social media popularity prediction by MRGB and Adam optimization', *Journal of Combinatorial Optimization*, Volume-41, Issue:02, page 328-347, Springer, ISSN: 1382-6905 (SCIE)
 - b. Sangwan, N. and Bhatnagar, V. (2021), 'A Framework for Video Popularity Forecast Utilizing Metaheuristic Algorithms', *Arabian Journal for Science and Engineering*, Springer, ISSN: 2191-4281(SCIE), <https://doi.org/10.1007/s13369-021-06146-w>
 - c. Shyla, and Bhatnagar, V.(2022), 'Perspicacious Apprehension of HDTbNB Algorithm Opposed to Security Contravention', Paper accepted in *Intelligent Automation & Soft Computing*, Tech Science press, Vol:35, No. 02, pp:205-221 ISSN: 2326-005X (SCIE)

Bio-Sketch: Vishal Bhatnagar holds B.E, MTech and PhD in the Engineering field. He has more than 21+ years of teaching experience in various technical institutions. He is currently working as Professor in Computer Science & Engineering Department at Netaji Subhash University of Technology (East Campus) Formerly Ambedkar Institute of Advanced Communication Technologies & Research, Delhi, India. His research interests include database, advance database, data warehouse, data mining, social network analysis, Data Science, Social

network analysis, Hyper personalization, video popularity prediction, Intelligent information retrieval, cloud computing, Blockchain and big data analytics. He has to his credit 149+ research papers in various international/national journals, conferences, and Book Chapters. He is currently working as Associate Editor of few Journals of IGI global and Inderscience. He has to his credit experience of handling special issues of Many Scopus, ESCI and SCIE Journals. He has also worked as editor of many edited books of Springer, IGI global, CRC press to name a few. He is also currently series editor of three CRC book aimed towards Handling Data Science problems and solutions related to Cloud computing, Blockchain and society 5.0. He is also working as expert of Regulatory and institutional bodies and has been an expert member of various selection panels and committees constituted by Govt. of India and other institutions. He is a member of IEEE and ISTE. Currently he is guiding 05 students for PhD and already guided 06 students

4.3 Prof. Nanhay Singh

1. Designation, Qualification: Professor & Ex-Head, Computer Science & Engineering Department, Ph.D., M.Tech. (CSE)
2. Area of Interest: Data Mining, Machine Learning, Web Engineering, Mobile and Vehicular Ad-hoc Network, Cloud Computing and Internet of Things
3. Email: nsingh1973@gmail.com, nsingh1973@aiactr.ac.in
4. Phone: +919971594480
5. Home Page: <http://aiactr.ac.in/index.php/academics/faculty-profile/cse-faculty-link/71-dr-nanhay-singh>
6. Selected Publications:
 - a. Sakshi Khullar ,Nanhey Singh “Machine learning techniques in river water quality modelling: a research travelogue” Journal of Water Supply | © IWA Publishing 2020[SCIE]
 - b. Gunjan Chug, Shailendera Kumar, Nanhay Singh "Survey on Machine learning and Deep learning applications in Breast Cancer Diagnosis" Journal of Cognitive Computation.COGN-D-20-00346R1 [SCIE]
 - c. Sakshi Khullar, Nanhey Singh "Water quality assessment of a river using deep learning Bi-LSTM methodology: forecasting and validation" Ms. No.ESPR- D-20-11888R2, Springer Journal Environmental Science and Pollution Research[SCI & SCIE]



7. **Bio-Sketch:** Prof. Nanhay Singh served as Head of Computer Science and Engineering Department at NSUT East Campus, Geeta Colony, Delhi-110031 (Formerly AIACTR) for four years. He obtained his M.Tech. (Computer Science and Engineering) and Ph.D. degree from Kurukshetra University, Kurukshetra. He has more than 22 years of teaching experience. He has supervised one Ph.D. research scholar and eight research scholars are doing research under his guidance. He has published more than 50 research articles in the reputed International Journals, Conferences and Books. He has organized 5 International Conferences and 7 FDPs and Workshops. He is also awarded Institute Research and Academic Activity Award in 2016 and 2017. He has delivered more than 30 expert talks in various reputed Universities and Institutes. He is the editor of two books published by International IGI Publisher. He has been editor and reviewer for various reputed International Journals and Conferences. He is a life time member of ISTE. He has been an expert member of various selection panels and committees constituted.

4.4 Dr. Vishal Gupta

1. **Designation, Qualifications :** Associate Professor, Ph.D
2. **Area of Interest:** Ad-Hoc networks, Wireless Sensor Networks, Security, Networking, IoT, Data Analytics
3. **Email:** vishalgupta@aiactr.ac.in
4. **Home Page:**
<http://nsuteastcampus.aiactr.ac.in/index.php/faculty>



5. Selected publications:

- a. Neha Sharma and Vishal Gupta, "Meta-heuristic based optimization of WSNs Localisation Problem - A Survey," International Conference on Smart Sustainable Intelligent Computing and Applications (ICITETM 2020), Delhi, India, Procedia Computer Science (ELSEVIER), volume 173, pages 36-45, 2020, doi.org/10.1016/j.procs.2020.06.006. [Scopus Indexed]
- b. Neha Sharma and Vishal Gupta, "Meta-heuristic based optimization of WSNs energy and lifetime - A Survey," 10th International Conference on Cloud Computing, Data Science &

Engineering (Confluence 2020), Noida, India, 2020, pp. 369-374, doi: 10.1109/Confluence47617.2020.9058294. (IEEE)

- c. YatenderChaturvedi, Sumit Kumar and Vishal Gupta, "Capacitance Requirement for Rated Current and Rated Voltage Operation of SEIG using Whale Optimization Algorithm", International Conference on Computational Intelligence and Data Science (ICCIDS 2019), Procedia Computer Science (ELSEVIER) volume 167, pages: 2581-2589, 2020, doi.org/10.1016/j.procs.2020.03.315. [Scopus Indexed]
6. **Bio-Sketch:** Dr. Vishal Gupta received his B.E. in Computer Science & Engineering from Rohilkhand University, U.P. He did his M.Tech from University School of Information Technology, Guru Gobind Singh Indraprastha University, Delhi. He pursued his doctorate (Ph.D) from Jamia Millia Islamia, Delhi. He has published various research papers in National/International journals and conferences. He has supervised several B.Tech and M.Tech students. His teaching and research interest include Ad-Hoc networks, Wireless Sensor Networks, Security, Compiler Design, Operating Systems, Data Analytics etc. He has more than 18 years of teaching experience. His current assignments include In-charge Academics apart from representation in other activities of the college and the department. He had also been In-charge Examinations in the past.

4.5. Dr. Suresh Kumar

1. **Designation, Qualifications:** Associate Professor, PhD, M. Tech (CSE)
2. **Areas of Interest:** Information Retrieval, Semantic Web, Ontology Engineering, Machine Learning.
3. **Email:** suresh.kumar@nsut.ac.in
4. **Home Page:** <http://nsut.ac.in/faculty/sk2/> and <http://aiactr.ac.in/index.php/academics/cse-faculty-link/28-suresh-kumar>



5. **List of Publications:**

- a. Sanjay Kumar, **Suresh Kumar**, “Experimental Analysis of Clustering approaches for Data Representation”. **Accepted** in ACM Computing Surveys, New York, Impact Factor:14.2, SCI Indexed.
- b. Anil Sharma, **Suresh Kumar**, “Shallow Neural Network and Ontology-Based Novel Semantic Document Indexing for Information Retrieval”. Intelligent Automation & Soft Computing, Intelligent Automation & Soft Computing DOI: 10.32604/iasc.2022.026095, Vol-34, Issue-3, pp: 1989-2005, published on 25th May 2022. Doi: <https://doi.org/10.32604/iasc.2022.026095>, IF: 3.4 (SCIE Indexed)
- c. Sanjay Kumar, **Suresh Kumar**, “Uncertainty Analysis in Ontology-Based Knowledge Representation”. New Generation Computing, Springer Nature. 17th March 2022. Doi: <https://doi.org/10.1007/s00354-022-00162-6>, IF:1.18 (SCIE Indexed)

6. **Bio-Sketch:**

Dr. Suresh Kumar is currently working as an Associate Professor in the Department of Computer Science and Engineering of Netaji Subhas University of Technology, East Campus (formerly AIACT&R Govt of NCT Delhi) from 29.06.2007. He has also taught in the Department of Computer Science & Engineering, NSUT Main Campus from 05.03.2020 to 31.12.2021. He has received his Ph.D. from Faculty of Engineering & Technology, MDU, Rohtak. He has worked as an Assistant Professor in the YMCAUS&T Faridabad, Manav Rachna International University, Amity University and GJU Hisar. He has more than 20 years of teaching, administrative and research experience. He has been awarded with Academic Excellence Award – 2017 for his outstanding contribution towards Academic and Research activities at AIACT&R. Currently four PhD research scholars are pursuing PhD under his guidance out of them

one PhD scholars has submitted his thesis. He has also selected for the best paper award for his research paper titled “Novel Ranking Approach using Pattern Recognition for Ontology in Semantic Search” in ICICT-2019 at KIET Ghaziabad. He has been working as Ph.D. (Research Coordinator) and M.Tech (IS)- Course Coordinator since 2017. He has published more than 50 research papers including 5 SCI publications with good impact factors in reputed International Journals and Conferences and contributed chapters as well.

4.6. Dr. Shobha Bhatt

1. **Designation, Qualification:** Assistant Professor, Ph.D.
2. **Email:**bhattsho@gmail.com
3. **Area of Specialization:** Speech Processing, Software Engineering, Information Security
4. **Selected publication:**
 - a. Bhatt, S., Dev, A. & Jain, A. Confusion analysis in phoneme based speech recognition in Hindi. Journal of Ambient Intelligence and Humanized Computing (2020). <https://doi.org/10.1007/s12652-020-01703-x>(SCIE -published) Springer Impact factor -1.91, ISSN:18685137
 - b. Shobha Bhatt, Anurag Jain and Amita Dev, “Acoustic Modeling in Speech Recognition: A Systematic Review” International Journal of Advanced Computer Science and Applications(IJACSA), 11(4), 2020. <http://dx.doi.org/10.14569/IJACSA.2020.0110455> (ESCI-published) The Science and Information Sciences ISSN: 2156-5570
 - c. Shobha Bhatt*, Amita Dev and Anurag Jain, “Effects of the Dynamic and Energy based Feature Extraction on Hindi Speech Recognition”, Recent Advances in Computer Science and Communications (2020), 13: 1, <https://doi.org/10.2174/2213275912666191001215916> (Scopus indexed-published) Bentham Sciences ISSN:2666-256
5. **Bio-Sketch:** Ms. Shobha Bhatt is pursuing Ph.D. in Computer Science and Engineering from Guru Gobind Singh Indraprastha University, Delhi and have more than twenty years of teaching experience. Her research areas are Speech processing and Information security. She has published papers in reputed international journals/conferences.



4.7. Dr. Bharti Nagpal



1. **Designation, Qualifications:** Assistant Professor, Ph.D
2. **Area of Interest:** Information Security, Web Technologies, Big Data, Data Mining and Data Warehouse, IoT, Machine Learning
3. **Email:**bharti_553@yahoo.com
4. **Phone:** 9990006701
5. **Home Page:**<http://aiactr.ac.in/index.php/academics/faculty-profile/cse-faculty-link/15-bharti-nagpal>
6. **Selected Publications:**
 - a. M.Dayal ,B.Nagpal , "A Compendious Investigation of Android Malware Family " , International Journal of Information Privacy, Security and Integrity, Inderscience, ISSN:1741-8496, 2(4), 330-352,2016.
 - b. B.Nagpal, N. Chauhan, N.Singh," SECSIX: Security Engine for CSRF, SQL Injection and XSS attacks " ,InternationalJournal of System Assurance Engg. and Management, Springer, ISSN:0976-4348, 8(2), 631-644,2017.
 1. P.Dhaka ,B.Nagpal, " ABFT: Analytics to Uplift Big Social Events using Forensic Tools", Handbook of Computer Networks and Cyber Security , Springer , doi.org/10.1007/978-3-030-22277-2_38 , 929-948,2020.

7. Bio-Sketch: Dr. Bharti Nagpal did her B.Tech in Computer Engg. from NIT Kurukshetra, M.Tech in Information Systems from NSUT Delhi and Ph.D in Computer Engg. from YMCAUST Faridabad. She has 21 years of teaching experience. Her areas of interest includes Web Technologies , Information Security, Data mining and Data Warehouse , IoT , Big Data , Machine Learning. She has published various research papers in reputed International Journals / Conferences and contributed Book Chapters. She has reviewed a number of research articles for reputed International Journals and acted as Member, Technical Programme Committee for International Conferences.

4.8. Dr. Ram Shringar Raw



1. **Designation, Qualifications:** Assistant Professor, PhD
2. **Areas of Interest:** Mobile Ad-hoc Networks, Vehicular and Flying Ad-hoc Networks, Electric & Connected Vehicles

Network, IoT and Blockchain Enabled Cloud Computing, Vehicular Sensor Networks.

3. **Email:**rsrao@aiactr.ac.in

4. **Phone:** +91-9968408090

5. **Home Page:**<http://www.aiactr.ac.in>

6. **Selected Publications:**

a. Omprakash Kaiwartya, **R. S. Raw**, and Abdul Hanan Abdullah “T-MQM: Testbed based Multi-metric Quality Measurement of Sensor Deployment for Precision Agriculture-A Use Case,” IEEE Sensors Journal, ISSN: 1530-437X, **(SCI, SCOPUS, DBLP) (IF = 3.076)**, UK, 2016, Volume: 16, Issue: 23, 2018, DOI: 10.1109/JSEN.2016.2614748, pp. 8649 – 8664.

b. K. Rana and **R. S. Raw**, “Inter-vehicle distance-based location aware multi-hop routing in vehicular ad-hoc network,” Journal of Ambient Intelligence and Humanized Computing, Springer, **(SCI, SCOPUS, DBLP) (IF = 4.594)**, ISSN: 1868-5145, 1-13, 2020.

c. K. Rana and **R. S. Raw**, “Link Reliability-Based Multi-Hop Directional Location Routing in Vehicular Ad-Hoc network,” Peer-to-Peer Networking and Applications, Springer **(SCIE, SCOPUS, DBLP, Q-2R) (IF = 2.793)**, ISSN: 1936-6450, 2020.

7. **Bio-Sketch:**

Dr. R S Rao received his Ph.D. from Jawaharlal Nehru University, New Delhi. He has worked as an Associate Professor in the Department of Computer Science, Indira Gandhi National Tribal University (A Central University, MP). He has more than 18 years of teaching, administrative and research experience. Currently he is performing the administrative works in the capacity of Student Welfare Officer (SWO) and Member of Training and Placement of the Institute. Dr. Rao has worked administrative works in the capacities of HOO (Head of Office, AIACTR), Member Academic Council (IGNTU), Chief Warden, Coordinator University Cultural Cell, Coordinator University Computer Centre, HoD of Computer Sc. and Engg., Proctor, Warden, Member of BOS and Nodal Officer of Technical Education Quality Improvement Programme (TEQIP) etc. Dr. Rao has published more than 100 research papers and edited books with good impact factors in reputed International Journals and Conferences and contributed chapters as well.

4.9. Dr. Amita Jain

1.Designation, Qualification: Asst. Prof., PhD., M. Tech, B.E.

2.Areas of Interest: Artificial Intelligence, Natural Language Processing, Sentiment Analysis, Soft Computing, Machine Learning

3.Email: amita_jain_17@yahoo.com

4. Phone: 9811569676

5.Homepage: <http://aiactr.ac.in/index.php/academics/faculty-profile/cse-faculty-link/18-amita-jain>

6. Selected Publications:

a. BP Nandi, **Amita Jain**, DK Tayal, PA Narang “High Performing Sentiment Analysis based on Fast Fourier Transform over Temporal Intuitionistic Fuzzy Value” Soft Computing, Springer, 2021, SCIE, Impact Factor 3.643

b. Jain, M., Suvarna, A., **Amita Jain** An evolutionary game theory based approach for query expansion. Multimed Tools Application <https://doi.org/10.1007/s11042-021-11297-x>, 2021, SCIE, Impact Factor 2.757

c. Kanika Mittal; **Amita Jain** et. al. “A Comprehensive Review on Type 2 Fuzzy Logic Applications: past, present and future” Engineering Applications of Artificial Intelligence, Elsevier, SCI indexed, Impact Factor 4.2, 2020

7. Bio-Sketch: Dr. Amita Jain has done her B.E.(CSE), M. Tech. (IT)and PhD (Natural Language Processing) from Jawaharlal Nehru University, New Delhi. She is having more than 18 years teaching and research experience. She is selected through UPSC. She has published more than 85 research papers in highly reputed International Journals and conferences including ACM Transactions, IEEE, Elsevier, Springer etc. She is the Associate Editor of International Journal of Forensic Software Engineering, Inderscience. She is also a reviewer on the panel of journals of IEEE, ACM, Elsevier etc. She has organized and delivered many talks in International Conferences, Seminars and Workshops held in NITs, DTU, DU etc. She supervised two Ph.D. students and four students are working under her guidance. She possesses Google H-Index Score of 15.0.

4.10. Mr. Arvind Kumar



1. Designation and Qualification: Assistant Professor, Ph. D. (Pursuing)

2. Area of Interest: Computer Architecture, Computer Network, Distributed System, Data Mining, Image Processing.

3. E-mail: arvindkumar@aiactr.ac.in

4. Phone: 7840003138

5. Homepage: <http://nsuteastcampus.aiactr.ac.in/index.php/faculty/10-cse-faculty-list/47-arvind>

6. Bio-sketch:

Mr. Arvind Kumar did his B. Tech. from Dr. Ram Manohar Lohia Avadh University, Ayodhya (Uttar Pradesh) and M. Tech. from Uttar Pradesh Technical University, Lucknow. He has almost 13 years of experience in teaching. He has published research papers and reviewed number of research articles for books and reputed international journals.



4.11. Prakash Rao Ragiri

1. Qualification, Designation: Assistant Professor, Ph.D (pursuing)

2. Area of Interest: MANET, VANET, Wireless Sensor Networks, Internet of Things(IoT)

3. E-Mail ID's: prakashraoragiri@gmail.com, prakashraoragiri@aiactr.ac.in

4. Mobile No: +91-8447424312

5. Homepage: <https://sites.google.com/aiactr.ac.in/ragiri>

6. Bio-Sketch: Mr **Prakash Rao Ragiri** received the **B. Tech.** degree in Computer Science and Engineering (CSE) from Nagarjuna University in 2003, M. **Tech.** degree with specialization in Computer Science Technology from Andhra university in 2005 and pursuing **Ph.D** degree in Computer Science and Technology at Jawaharlal Nehru University (JNU) Delhi. He has over 12 years of teaching, and 2years of industry and research experience.

He has about 10 publications to his credit. His research interests include Computer Science and Engineering, Wireless Sensor and Networks, MANET, VANETS and Internet of Things (IoT). He has guided several students for B.Tech and M.Tech projects. He has participated in two weeks of Short-term Training Programs sponsored by AICTE / ISTE / DST, India and has delivered lectures in various workshops and



seminars. He has organized various training programs for Faculty and Students in the field of CSE.

5. Laboratory Infrastructure:

5.1 Computing Lab:

Computing lab is having 27, i5 computer systems with C, Turbo C++ IDE, Borland Turbo C++ and Python software support. It facilitates Ph.D., M. Tech and B.Tech students in performing experiments related to Soft Computing, Natural Language Processing and Data Structures.

5.2. Data Mining Lab:

This lab was setup in 2008 with the aim to provide an environment for the students and research scholar to understand the importance of data and its analysis to uncover the real hidden information from the data. Through this lab students are able to analyse the data using the IBM data mining analytical Tool Clementine 12 with a capacity of 25 user's license along with server license which is perpetual in nature. The availability of the tool in the lab makes it easy for the learners to understand the various tools and techniques including algorithms of Data mining. In fact it helps students of UG, PG and research students to thoroughly understand the way to analyse the vast amount of data using various statistical techniques.

5.3. Information Security Lab:

This Lab has been set up especially for the PG students with the aim to address the challenging issues in information security. The lab has been equipped with tools like NMap, Nessus, Wireshark, Kali Linux Live CD, NS2/NS3 to help students in learning the Computers and Network Security concepts like Attack Analysis, Threat Analysis, Vulnerability Analysis and Web Application Security. In this lab, Radware Machine kits are also being used to learn DDoS Protection, Web Application Security and Network Security Solution. Not only the lab provides resources to work on firewall device and IPS device, but it is also helpful to students in carrying out the research for their Dissertation work in the area of Information Security.

5.4. Networking Lab:

In this lab, students will learn how to put "principles into practice," in a networking lab environment. The lab will cover router and end-system labs in the areas of Single Segment IP Networks, Multiple Segment IP Networks and Static Routing, Dynamic Routing Protocols (RIP, OSPF and

BGP), LAN switching, Transport Layer Protocols: UDP and TCP, NAT, DHCP, DNS, and SNMP. In this, lab students implement protocol using socket programming. It has the infrastructure for carrying out UG and PG experiments in Computer Network, Advance Computer Network, and Information security.

5.5. Software Engineering Lab:

In this lab, Students of UG/PG will be exposed to practical usage of CASE tools like Rational Software Architect so as to automate the Object Oriented Methods (UML) for design and development of Quality software within time and budget. This Lab is having 30 users perpetual license to work in client server mode.

5.6. Multimedia Lab:

In this Lab, students will have practical exposure for usage of open source multimedia tools. This Lab is equipped with i-5/i-7 machines along with Adobe Creative Suite for the Students. This lab is also used for students to carry out experiment for Java/python programming and Image Processing

5.7. Operating System Lab:

In this Lab, students will perform experiments for the operating system lab. This Lab is equipped with (i-5/i-7) machines with Linux and Windows Operating Systems.

6 Eligibility with respect to Bachelors & Masters Degree.

List of Degrees in B.E. / B.Tech. considered for admission for TRF

1. Artificial Intelligence
2. Natural Language Processing
3. Computer & Communication Engineering
4. Computer and Information Science
5. Computer Engineering
6. Computer Engineering & Applications
7. Computer Science
8. Computer Science & Engineering
9. Computer Science & Information Technology
10. Cyber Forensics
11. Cyber Forensics and Information Security
12. Cyber Security
13. Information Technology
14. Information Technology & Engineering

15. Software Engineering

With M. Tech. specialization in any of the branches mentioned below.

1. Advanced Communication and Information System
2. Artificial Intelligence
3. Animation And Multimedia Technology
4. Computer & Communication Engineering
5. Computer Applications
6. Computer and Information Science
7. Computational Techniques
8. Computer Engineering,
9. Computer Engineering & Applications
10. Computer Networking
11. Computer Science
12. Computer Science & Engineering
13. Computer Science & Information Technology
14. Computer Technology & Applications
15. Computer Science & Technology
16. Computer Science and Systems Engineering
17. Computer Technology
18. Computing in Multimedia
19. Computing in Software
20. Cyber Forensics
21. Cyber Forensics and Information Security
22. Cyber Security
23. Distributed and Mobile Computing
24. Distributed Systems
25. Data Sciences
26. Information & Communication Technology,
27. Information Engineering
28. Information Science & Engineering
29. Information Science & Technology
30. Information Security
31. Information System
32. Information Technology
33. Information Technology & Engineering,
34. Mathematics & Computing,
35. Mobile & Pervasive Computing,

36. Multimedia and Software Engineering
37. Multimedia Technology
38. Network Engineering
39. Networking
40. Networking and Internet Engineering
41. Pervasive Computing Technology
42. Software Engineering
43. Software Systems
44. Software Technology
45. Software Testing
46. Web Designing
47. Web Technologies
48. Wired and Wireless Communication
49. Wireless and Mobile Communications
50. Wireless Communication & Computing
51. Wireless Communication Technology
52. Wireless Communications
53. Wireless Networks and Applications
54. Wireless Technology
55. 3-D Animation & Graphics

7 SYLLABUS FOR WRITTEN TEST:

The entrance test shall consist of 100 multiple choice questions. There shall be no negative marking. 50 questions shall be based on Research Aptitude/Methodology which shall include quantitative methods/computer applications, experimental techniques etc. and 50 questions shall be subject specific. The test shall be of TWO hours.

Part A Research Aptitude/Methodology:

Unit-1 Research Aptitude

- Research: Meaning, Types, and Characteristics, Positivism and Post-positivistic approach to research.
- Methods of Research: Experimental, Descriptive, Historical, Qualitative and Quantitative methods.
- Steps of Research.
- Thesis and Article writing: Format and styles of referencing.
- Application of ICT in research.
- Research ethics.

Unit-2 Comprehension & Communication

- A passage of text be given. Questions be asked from the passage to be answered.
- Communication: Meaning, types and characteristics of communication.
- Effective communication: Verbal and Non-verbal, Inter-Cultural and group communications, Classroom communication.
- Barriers to effective communication.
- Mass-Media and Society.

Unit-3 Mathematical Reasoning and Aptitude

- Types of reasoning.
- Number series, Letter series, Codes and Relationships.
- Mathematical Aptitude (Fraction, Time & Distance, Ratio, Proportion and Percentage, Profit and Loss, Interest and Discounting, Averages etc.) Unit-VI Logical Reasoning
- Understanding the structure of arguments: argument forms, structure of categorical propositions, Mood and Figure, Formal and Informal fallacies, Uses of language, Connotations and denotations of terms, Classical square of opposition.
- Evaluating and distinguishing deductive and inductive reasoning.
- Analogies.
- Venn diagram: Simple and multiple use for establishing validity of arguments.

Unit-4 Data Interpretation

- Sources, acquisition and classification of Data.
- Quantitative and Qualitative Data.
- Graphical representation (Bar-chart, Histograms, Pie-chart, Table-chart and Line-chart) and mapping of Data.
- Data Interpretation.
- Data and Governance.

Unit-5 Information and Communication Technology (ICT)

- ICT: General abbreviations and terminology.
- Basics of Internet, Intranet, E-mail, Audio and Video-conferencing.
- Digital initiatives in higher education.
- ICT and Governance.

NOTE: (i) Equal number of questions are to be set from each Unit.
(ii) Whenever graphical/pictorial question(s) are set for sighted candidates, a passage followed by equal number of questions and weightage be set for visually impaired candidates.

PART B Department Specific Subject:

UNIT -1

Engineering Mathematics: Discrete Mathematics: Propositional and first order logic. Sets, relations, functions, partial orders and lattices. Groups. Graphs: connectivity, matching, coloring. Combinatorics: counting, recurrence relations, generating functions. Linear Algebra: Matrices, determinants, system of linear equations, eigenvalues and eigenvectors, LU decomposition. Calculus: Limits, continuity and differentiability. Maxima and minima. Mean value theorem. Integration. Probability: Random variables. Uniform, normal, exponential, poisson and binomial distributions. Mean, median, mode and standard deviation. Conditional probability and Bayes theorem.

UNIT-2

Digital Logic: Boolean algebra. Combinational and sequential circuits. Minimization. Number representations and computer arithmetic (fixed and floating point).

UNIT-3

Computer Organization and Architecture: Machine instructions and addressing modes. ALU, data-path and control unit. Instruction pipelining. Memory hierarchy: cache, main memory and secondary storage; I/O interface (interrupt and DMA mode).

UNIT-4

Programming, Data Structures & Algorithms: Programming in C. Recursion. Arrays, stacks, queues, linked lists, trees, binary search trees, binary heaps, graphs. Searching, sorting, hashing. Asymptotic worst case time and space complexity. Algorithm design techniques: greedy, dynamic programming and divide-and-conquer. Graph search, minimum spanning trees, shortest paths.

UNIT-5

Theory of Computation: Regular expressions and finite automata. Context-free grammars and push-down automata. Regular and context-free languages, pumping lemma. Turing machines and undecidability.

UNIT-6

Compiler Design: Lexical analysis, parsing, syntax-directed translation. Runtime environments. Intermediate code generation.

UNIT-7

Operating System: Processes, threads, inter-process communication, concurrency and synchronization. Deadlock. CPU scheduling. Memory management and virtual memory. File systems.

UNIT-8

Databases: ER-model. Relational model: relational algebra, tuple calculus, SQL. Integrity constraints, normal forms. File organization, indexing (e.g., B and B+ trees). Transactions and concurrency control.

UNIT-9

Computer Networks: Concept of layering. LAN technologies (Ethernet). Flow and error control techniques, switching. IPv4/IPv6, routers and routing algorithms (distance vector, link state). TCP/UDP and sockets, congestion control. Application layer protocols (DNS, SMTP, POP, FTP, HTTP). Basics of Wi-Fi. Network security: authentication, basics of public key and private key cryptography, digital signatures and certificates, firewalls.

6.1.5 DEPARTMENT OF INFORMATION TECHNOLOGY (MAIN CAMPUS)

1. The Department

The Information Technology division was introduced in the year 2002 with an intake of 60 students to meet the increasing demand of IT professionals. The division offers Bachelors and Ph.D. programs in Information Technology. It provides an excellent learning environment with dedicated young faculty members, state-of-the-art laboratories and innovative academic processes. The division focuses on providing an in-depth knowledge in the field of Information Technology such as data structures & algorithms, databases, networks, multimedia, software engineering, internet of things (IoT), machine learning, to name a few. We aspire our students towards becoming next

generation IT professionals capable of generating programming and logical skills, providing networking solutions and becoming leaders in software industry, government and academia.

The Department has 08 faculty members, 01 Professors, 07 Assistant Professors and most of the faculty members are Doctoral degree holders. The Department Information Technology, Netaji Subhas University of Technology (formerly Netaji Subhas Institute of Technology) was established in the year 1983. A number of students from this department often pursue post-graduate studies, exhibiting their ability to continue research in diverse areas. Some of the students are also absorbed at the best institutes in India such as IIM's etc. and even outside India. This reveals the success of the department in providing a foundation for research and development among their students. The students of this branch even get appointments from various topmost Multinational Corporations (MNCs) through campus placements.

2. Courses Offered

This discipline was introduced in the academic session 2002-03 with an intake of 60 students to meet the growing demand of IT professionals. The Department offers 02 Undergraduate (UG) programmes. In addition, the Department also offers 01 Post Graduate (PG) programme and a research program at the doctoral level (Ph.D.). To keep in pace with the current technological advancements, the UG curriculum has been recently modified so that the students get a feel of what exactly is happening outside in the tech-world.

- B. Tech - Information Technology (120 students - Eight Semesters- Choice Based Credit System)
- B. Tech - Information Technology (Network & Information Security) (60 students - Eight Semesters- Choice Based Credit System)
- M. Tech – Mobile Communication and Network Technology (30 students - Four Semesters- Choice Based Credit System)
- M. Tech – Information Technology (18 students - Six Semesters- Choice Based Credit System, Weekend Programme)
- Doctor of Philosophy (Ph.D.)

3. Areas of Research and Available Vacancies

- **Computer Networks:** Computer Networks, Mobile Computing, Wireless Ad-hoc Networks, Sensor Networks, Underwater Sensor Networks, Cognitive Radio Networks, Opportunistic Networks, Network & Information security, Internet-of-Things, Cloud Computing.

- **Artificial Intelligence:** Machine Learning, Deep Learning, Sentiment Analysis, Digital Image Processing, Data Mining.
- **Software Engineering:** Software testing, Software quality prediction models, computational intelligence.
- **Data science:** Databases, data mining, data warehousing, big data analytics, Bio- informatics.

3.1 Tentative Seats:

For the session 2022-23 (Even semester), the maximum number of seats in the Department of Information Technology (Main campus) is limited to

- **Vacancies with university fellowship :06**
- **Vacancies without university fellowship: 06**

University reserves the right to change the number of seats.

***The table below indicates the maximum number of vacancies available in various areas of research. However, the total numbers of seats are as given above**

S. No.	Area of Research	Faculty	No. of candidates to be taken in coming session	
			With Univ. Fellowship	Without Univ. Fellowship
1.	Computer Networks	1. Dr. Sanjay Kumar Dhurandher	—	---
		2. Dr. Deepika Kukreja	---	—
2.	Artificial Intelligence, Data Science	1. Dr. Amarjit Malhotra	02	02
3.	Software Engineering	1. Dr. Ankita Bansal	01	02
4.	Digital Image Processing, Data Mining,	Prof. Audithan Sivaraman (West Campus)	01	01

	Cryptography and Network Security			
5.	Digital Image Processing, Data Mining, Cryptography and Network Security	Dr. Devender Kumar	01	Nil
6.	Pattern Recognition, Computer vision	Dr. Vikas Maheshkar	01	01

4. Faculty Profile

4.1 Dr. Sanjay Kumar Dhurandher

1. Name, Designation, Qualification: Dr. Sanjay Kumar Dhurandher, Professor and Head, M. Tech, Ph.D.

2. Area of Interest: Computer Networks, Wireless Ad-hoc Networks, Sensor Networks, Cognitive Radio Networks, Opportunistic Networks, Network & Information security, Internet-of-Things, Cloud Computing, AI and Machine Learning.

3. List of Publications

- N. Gupta, Sanjay K. Dhurandher and I. Woungang, "Subcarriers Assignment Scheme for Multiple Secondary Users in OFDMA-based IEEE 802.22 WRAN: A Game Theoretic Approach," *Transactions on Emerging Telecommunications Technologies*, John Wiley & Sons, Vol. 29, No. 11, 2018, DOI: 10.1002/ett.3502 (**SCIE Indexed, Impact Factor – 1.606**).
- Sanjay K. Dhurandher, A. Kumar and M. S. Obaidat, "Cryptography-Based Misbehavior Detection and Trust Control Mechanism for Opportunistic Network Systems," *IEEE Systems Journal*, Vol. 12, No. 04, pp. 3191-3202, 2018 (**SCI Indexed, Impact Factor – 3.882**).
- Sanjay K. Dhurandher, S. J. Borah, I. Woungang, A. Gupta, A. Bansal, "A Location Prediction-based Routing Scheme for Opportunistic Networks in an IoT Scenario," *Journal of Parallel and*



Distributed Computing, Elsevier, Vol. 118(part), pp. 369-378, 2018 (**SCI Indexed, Impact Factor – 1.930**).

4. Email: dhurandher@gmail.com

5. Phone/Mobile no.: 9205475011

6. Home page: <http://nsut.ac.in/faculty/skd/>

7. Bio Sketch:**Sanjay K. Dhurandher** received the *M. Tech. and Ph.D.* Degrees in Computer Science from the Jawaharlal Nehru University, New Delhi, India. He is presently working as a *Professor* in the Department of Information Technology, Netaji Subhas University of Technology (*Formerly NSIT*) New Delhi. From 1995 to 2000 he worked as a Scientist/Engineer at the Institute for Plasma Research, Gujarat, which is under the Department of Atomic Energy, India. His current research interests include Wireless ad-hoc Networks, Sensor Networks, Computer Networks, Network Security, Underwater Sensor Networks, Opportunistic Networks, Cognitive Radio Networks, Internet-of-Things, Cloud Computing. He is also a *Senior Member of IEEE* and *Fellow of IETE*.

4.2 Dr. Amarjit Malhotra

1. Name, Designation, Qualification: Amarjit Malhotra, Associate Professor, M. Tech, Ph.D

2. Area of Interest: Artificial Intelligence, Data Science, Cloud computing, Fog computing, Internet of Things.

3. List of Publications:

Amarjit Malhotra, Sanjay Kumar Dhurandher, Megha Gupta, Bijendra Kumar, "EMCloud: A Hierarchical Volunteer Cloud with Explicit Mobile Devices," *International Journal of Communication Systems*, Wiley, Volume 31, Issue 17. SCIE Indexed.

a. Amarjit Malhotra, Sanjay K Dhurandher, Megha Gupta, Bijendra Kumar, "Best fit power weighted difference method for fog node selection in smart cities," *IET Communications*, 2020.

b. Amarjit Malhotra, S. K. Dhurandher, Megha Gupta, Bijendra Kumar, "Integer multiplication ranking method for cloud services selection," *Journal of Ambient Intelligence and Humanized Computing*, 2020. SCIE Indexed.

4. Email: uppalz_amar@yahoo.com, amarjit.malhotra@nsut.ac.in

5. Phone/Mobile no:9971802266



6. Home page: <http://nsut.ac.in/faculty/amr/>
7. Bio-Sketch: **Amarjit Malhotra** is an assistant professor at Netaji Subhas University of Technology, Delhi, India. She has teaching experience of about 20 years. Her research interests are Machine learning, Deep learning, Cloud computing, Fog computing and Internet of Things.

4.3 Dr. Devender Kumar

1. Name, Designation, Qualification: Dr. Devender Kumar, Associate Professor, M.Tech., Ph.D.

2. Area of Interest: Cryptography and network security, Security in IoT, WSNs and cloud computing, Image processing, Soft computing

3. List of Publications:

- Devender Kumar, Satish Chand and Bijendra Kumar, "Cryptanalysis and Improvement of an Authentication Protocol for Wireless Sensor Networks Applications like Safety Monitoring in Coal Mines", Journal of Ambient Intelligence and Humanized Computing, Springer, 10(2), 641-660 (2019) (SCIE)
- Devender Kumar, Harmanpreet Singh Grover and Adarsh, "A Secure Authentication Protocol for Wearable Devices Environment using ECC", Journal of Information Security and Application, 47, 8-15 (2019) (SCIE)
- Damandeep Kaur, Devender Kumar, Khushil Kumar Saini and Harmanpreet Singh Grover, "An Improved User Authentication Protocol for Wireless Sensor Networks", Transactions on Emerging Telecommunications Technologies, Willey (Accepted, 2019) (SCIE)

4. Email: dk_iitm@yahoo.co.in

5. Phone/Mobile no.: 9013489217

6. Home Page: <http://nsut.ac.in/faculty/dev/>

7. Bio-Sketch: **Devender Kumar** is an Assistant Professor in the department of Information Technology. He received Ph. D. from University of Delhi, M.Tech. (Computer Science and Engineering) from IIT, Madras and M.Sc. (Mathematics) from Panjab University, Chandigarh. He qualified JRF-NET in Mathematical Sciences jointly conducted by UGC-CSIR and also qualified GATE exam conducted by IIT's. He also obtained National Board of Higher Mathematics (NBHM) scholarship during his M.Sc. (Mathematics). Prior joining NSIT, he has nearly five years of experience in industry and teaching in HCL Technologies, Wipro Technologies and Guru Jambheshwar University



Institute of Engineering and Technology, Hisar (Haryana). His area of interest includes cryptography, discrete structures, compilers, design & analysis of algorithms, image processing, soft computing, theory of computations and computer graphics.

4.4 Dr. Deepika Kukreja

1. Name, Designation, Qualification: Deepika Kukreja, Assistant Professor, Ph.D, M.Tech, B.E.

2. Area of Interest: Wireless Networks, Cloud Computing, Internet of Things.

3. Email: deepikakukreja18@gmail.com

4. Phone/Mobile no.: 09811849811

5. Home page: <http://nsut.ac.in/faculty/dee/>

6. List of Publications:

- Deepika Kukreja, S. K. Dhurandher and B. V. R. Reddy, “Power aware malicious nodes detection for securing MANETs against packet forwarding misbehavior attack,” *Journal of Ambient Intelligence and Humanized Computing*, Springer, pp. 1-16, April 2017, doi:10.1007/s12652-017-0496-2. Impact factor=1.423.
- Deepak Kumar Sharma, Deepika Kukreja, Pranav Aggarwal, Manpreet Kaur, Ayushee Sachan, “Poisson’s probability-based Q-Routing techniques for message forwarding in opportunistic networks,” *International Journal of Communication Systems*, Wiley, pp. 1-23, May 2018, doi: 10.1002/dac.3593. Impact factor=1.717.
- Deepak Kumar Sharma, Deepika Kukreja, Samarth Chughand, Shubham Kumaram, “Supernode routing: a grid-based message passing scheme for sparse opportunistic networks,” *Journal of Ambient Intelligence and Humanized Computing*, Springer, pp 1–18, August 2018, <https://doi.org/10.1007/s12652-018-0993-y>, Impact factor=1.423.

7. Bio-Sketch: **Deepika Kukreja** is an Assistant Professor at Netaji Subhas University of Technology, Delhi, India. She received her M. Tech. degree from YMCA in year 2005 and done Ph.D from GGSIP University, Delhi. She has more than fifteen years of teaching experience. She is reviewer of many reputed international journals. Her research areas of interest are wireless networks, Network Security, Cloud Computing and Internet of Things.



4.5 Dr. Vikas Maheshkar

1. Name, Designation, Qualification: Dr. Vikas Maheshkar, Assistant Professor, M.Tech, Ph.D

2. Areas of Interest: Image Processing, Pattern Recognition, Computer Vision, Natural Language Processing

3. List of Publications:

- Vikas Maheshkar, SushilaKamble, Suneeta Agarwal, Vinay Srivastava, “Feature image generation using low, mid and high frequency regions for face Recognition,” *International journal of Multimedia & Its Applications (IJMA)*, AIRCC, Vol.4, No.1, February 2012, pp. 75-82 (ISSN: 0975-5578)
- Gaurav Agarwal, Vikas Maheshkar, SushilaMaheshkar , Sachi Gupta, “Vocal mood recognition: text dependent sequential and parallel approach,” *SIGMA-2018 Springer Book Series, Advances in Intelligent Systems and Computing*.
- Choudhary Shyam Prakash, Avinash Kumar, SushilaMaheshkar, Vikas Maheshkar, “An Integrated Method of Copy-move and Splicing for Image Forgery Detection,” *Multimedia Tools and Applications, Springer, Mar 2018*.

4. Email: vikas.maheshkar@gmail.com, vikas.maheshkar@nsut.ac.in

5. Phone/Mobile no:8826868298

6. Home Page: <http://nsut.ac.in/faculty/vik/>

7. Bio-Sketch: **Dr. Vikas Maheshkar** is assistant professor in Division of Information Technology at NSUT, New Delhi. His areas of interest include image processing, Pattern recognition, computer vision and Artificial Intelligence. Dr. Vikas Maheshkar has an academic credentials with a Ph.D from NIT Allahabad, M.Tech(Computer science and Engineering) from SATI, Vidisha and B.Tech(Computer Technology) form Nagpur University. With a teaching experience of more than eight years, he has published papers in International Conferences and in International Journals of repute.



4.6 Dr. Ankita Bansal

1. Name, Designation, Qualification: Dr. Ankita Bansal, Assistant Professor, Ph.D

2. Area of Interest: Software quality, software metrics, soft computing, machine learning, meta-heuristic models

3. List of Publications:



- Ruchika Malhotra and Ankita Bansal, “Fault Prediction Considering Threshold Effects of Object-Oriented Metrics,” *Expert Systems*, Wiley, vol. 32, no. 2, pp. 203-219, 2015.
- Ankita Bansal, “Empirical Analysis of Search Based Algorithms to Identify Change Prone Classes of Open Source Software,” *Computer Languages, Systems & Structures, Elsevier*, vol. 47, 211–231, 2017.
- Ruchika Malhotra and Ankita Bansal, “Predicting Software Change in an Open Source Software using Machine Learning Algorithms,” *International Journal of Reliability Quality and Safety Engineering*, World Scientific, vol. 20, no. 6, pp. 1-14, 2014.

4. Email: ankita.bansal06@gmail.com

5. Phone/Mobile no:9654275366

6. Home page: <http://nsut.ac.in/faculty/ank/>

7. Bio-Sketch: **Ankita Bansal** is an assistant professor at Netaji Subhas UNIVERSITY of Technology, Delhi, India. Prior to joining the university, she worked as full-time research scholar at Delhi Technological University (formerly Delhi College of Engineering), Delhi, India. She received her master’s and doctoral degree in computer science from Delhi Technological University. Her research interests are software quality, soft computing, database management, cloud computing, machine learning and meta heuristic models. She has published several papers in international journals and conferences.

4.7 Mr. Satish Kumar Singh

1. Name, Designation, Qualification: Mr. Satish Kumar Singh, Assistant Professor, M.Tech (IT) Integrated.

2. Area of Interest:(for Ph.D Admission) : Object Oriented Software Engineering, Computer Network, Data Analytics

3. List of Publications:

- Satish Kumar Singh, “Impact of Data Mining Technology in E-commerce Environment,” *IFRSA International Journal of Data Warehousing & Mining (IJDWM)*, Vol 4-issue3, August 2014.



4. Email: satishsingh23@gmail.com, satish.singh@nsut.ac.in

5. Phone/Mobile no.: 9999163593

6. Home page: <http://nsut.ac.in/faculty/sks/>

7. Bio-Sketch: **Satish Kumar Singh** is an Assistant Professor at Netaji Subhas University of Technology, New Delhi since 2014. He has obtained M.Tech(Integrated) degree in Information Technology from University School of IT, Guru Gobind Singh Indraprastha University, New Delhi. Prior to joining

the university, he has worked as Software Engineer for over two years with Mindfire Solutions. He has also worked as Assistant Professor with Indraprastha Engineering College(IPEC), Ghaziabad, Maharaja Surajmal Institute of Technology (MSIT) and BanarsidasChandiwala Institute of Information Technology(BCIIT), New Delhi. He has over eight years of teaching experience. His areas of interest are Object Oriented Software Engineering, Computer Networks and Data Analytics.

4.8 Prof. Audithan Sivaraman(West Campus)

1. Name, Designation, Qualification: Professor and Head, Department of Information Technology (West Campus) B.E., M.E., Ph.D.



2. Area of Interest: Digital Image Processing, Data Mining, Cryptography and Network Security

3. Selected List of Publications

- SuyelNamasudra ,PinkiRoy, PandiVijayakumar,**AudithanSivaraman** and BalamuruganBalusamy,“TIME EFFICIENT SECURE DNA BASED ACCESS CONTROL MODEL FOR CLOUD COMPUTING ENVIRONMENT”, **Future Generation Computer Systems, Elsevier** .Vol 73,Pages 90-105, ISSN: 0167-739X, **SCI Indexed IF: 7.187**
- LJ Deborah, R Sathiyaseelan, **AudithanSivaraman**, P Vijayakumar, “FUZZY-LOGIC BASED LEARNING STYLE PREDICTION IN E-LEARNING USING WEB INTERFACE INFORMATION”, **SADHANA, SPRINGER**, Vol.40 No.2, PAGE NO. 379-394,ISSN: 0973-7677,**SCI Indexed IF: 1.188**
- **AudithanSivraman**, VijayaregunathanVijayasaro, P.Vijayakumar and V.Vijayakumar, “AN EFFICIENT AUTHENTICATION SCHEME FOR MOBILE CLOUD COMPUTING SERVICES”, **INTERNATIONAL JOURNAL OF INFORMATION SCIENCE AND ENGINEERING**,CCS JOURNAL,Vol .33 No.3, PAGE NO. 727-741, ISSN: 1016-2364, **SCI Indexed IF: 0.813**
- SathiyaseelanRathinavel, Vijayakumar Pandi and **AudithanSivaraman**, “ON THE EXPLORATION OF ADAPTIVE MECHANISMS PROVIDING RELIABILITY IN CLUSTERED WSNS FOR POWER PLANT MONITORING”, **THE SCIENTIFIC WORLD JOURNAL ARTICLE**, Vol .2016 No.1,PAGE NO. 1-13,Year.2016,ISSN: 1537-744X, **SCI Indexed IF:1.625**

4. Email: saudithan@gmail.com ,audithan.sivaraman@nsut.ac.in

5. Phone/Mobile no.: 9443402775

6. Home page: <http://gecdelhi.ac.in/default.html>

7. Bio Sketch: **Prof.AudithanSivaraman** received the *M.E, and Ph.D*, Degrees in Computer Science and Engineering from Annamalai university, Tamilnadu, India. He is presently working as a *Professor and Head* in the

Department of Information Technology, Netaji Subhas University of Technology (West Campus). He has more than 21 years of teaching experience and has published more than 55 research papers in International journals and 12 papers in International conferences of repute. He has chaired many international conferences and 7 Ph.D theses have been completed under his guidance. He has been expert member of various committees like NBA, NAAC. He has been holding reviewer position in many SCI indexed journals. His current research interests include Data mining, Cryptography and Network Security, Digital Image Processing, Security in e health environments. He is also a *Member of IEEE*.

5. Laboratory Infrastructure

Each state-of-the-art laboratory is managed by a Faculty-In-Charge and a staff-in-charge

5.1 Internet & Web Technology Lab

Internet & Web Technology Lab of Information Technology Division gives a student an opportunity to implement the concepts of internet and web technology domain for finding solutions of challenging practical problems and explore with implementation. Internet & Web Technology Lab deals with the design, development, testing and maintenance of Web applications. It is used to create high-quality WebApps. Internet & Web Technology Lab has tools to implement the protocols for communication networks, interfacing to databases, programming of graphical user interfaces, or structuring information also deals with web designing techniques that make students to innovate their designing skills using DHTML, Java Script, Servlet and construction of instant messenger.

The objective of this lab is to develop ability among students to design and implement static and dynamic website and use PHP and .Net tools. This Lab is a part of programming world of XML Technologies, XML Tags, Database Handling with PHP and XML.

5.2 Mobile Computing Lab

The Mobile Computing Lab of Information Technology Division of NSIT is well equipped with the latest hardware and software. The Lab is widely used by the undergraduate students to learn various concepts of wireless networks and mobile computing. It provides a facility to the students to practically implement various problems related to networking and explore their solutions. Since the Lab is equipped with computer systems having WiFi cards, the students can easily broadcast and receive network connections. They can focus and lay emphasis on designing and evaluating mobile

systems, protocols and various applications. In other words, this lab supports various tools for implementing protocols for networks and interfacing/connecting to the databases. The lab also allows the students to conduct research and innovations in many areas of wireless networks to enable them to broaden their horizons in this field of knowledge.

5.3 Real Time Systems Lab

Real Time Lab of Information Technology Division give its students an opportunity to apply the theoretical knowledge for finding solutions of challenging practical problems.

6. ELIGIBILITY WITH RESPECT TO BACHELORS & MASTERS DEGREE.

List of Degrees in B.E. / B.Tech. considered for admission for TRF

1. Artificial Intelligence
2. Computer & Communication Engineering
3. Computer and Information Science
4. Computer Engineering
5. Computer Engineering & Applications
6. Computer Science
7. Computer Science & Engineering
8. Computer Science & Information Technology
9. Cyber Forensics
10. Cyber Forensics and Information Security
11. Cyber Security
12. Information Technology
13. Information Technology & Engineering
14. Software Engineering

With M. Tech. specialization in any of the branches mentioned below.

1. Advanced Communication and Information System
2. Artificial Intelligence
3. Animation And Multimedia Technology
4. Computer & Communication Engineering
5. Computer Applications
6. Computer and Information Science
7. Computational Techniques
8. Computer Engineering,
9. Computer Engineering & Applications
10. Computer Networking
11. Computer Science
12. Computer Science & Engineering
13. Computer Science & Information Technology

14. Computer Technology & Applications
15. Computer Science & Technology
16. Computer Science and Systems Engineering
17. Computer Technology
18. Computing in Multimedia
19. Computing in Software
20. Cyber Forensics
21. Cyber Forensics and Information Security
22. Cyber Security
23. Distributed and Mobile Computing
24. Distributed Systems
25. Data Sciences
26. Information & Communication Technology,
27. Information Engineering
28. Information Science & Engineering
29. Information Science & Technology
30. Information Security
31. Information System
32. Information Technology
33. Information Technology & Engineering,
34. Mathematics & Computing,
35. Mobile & Pervasive Computing,
36. Multimedia and Software Engineering
37. Multimedia Technology
38. Network Engineering
39. Networking
40. Networking and Internet Engineering
41. Pervasive Computing Technology
42. Software Engineering
43. Software Systems
44. Software Technology
45. Software Testing
46. Web Designing
47. Web Technologies
48. Wired and Wireless Communication
49. Wireless and Mobile Communications
50. Wireless Communication & Computing
51. Wireless Communication Technology
52. Wireless Communications
53. Wireless Networks and Applications
54. Wireless Technology
55. 3-D Animation & Graphics

7 SYLLABUS FOR WRITTEN TEST:

The entrance test shall consist of 100 multiple choice questions. There shall be no negative marking. 50 questions shall be based on Research Aptitude/Methodology which shall include quantitative methods/computer applications, experimental techniques etc. and 50 questions shall be subject specific. The test shall be of TWO hours.

Part A Research Aptitude/Methodology:

Unit-1 Research Aptitude

- Research: Meaning, Types, and Characteristics, Positivism and Post-positivistic approach to research.
- Methods of Research: Experimental, Descriptive, Historical, Qualitative and Quantitative methods.
- Steps of Research.
- Thesis and Article writing: Format and styles of referencing.
- Application of ICT in research.
- Research ethics.

Unit-2 Comprehension & Communication

- A passage of text be given. Questions be asked from the passage to be answered.
- Communication: Meaning, types and characteristics of communication.
- Effective communication: Verbal and Non-verbal, Inter-Cultural and group communications, Classroom communication.
- Barriers to effective communication.
- Mass-Media and Society.

Unit-3 Mathematical Reasoning and Aptitude

- Types of reasoning.
- Number series, Letter series, Codes and Relationships.
- Mathematical Aptitude (Fraction, Time & Distance, Ratio, Proportion and Percentage, Profit and Loss, Interest and Discounting, Averages etc.) Unit-VI Logical Reasoning
- Understanding the structure of arguments: argument forms, structure of categorical propositions, Mood and Figure, Formal and Informal fallacies, Uses of language, Connotations and denotations of terms, Classical square of opposition.
- Evaluating and distinguishing deductive and inductive reasoning.
- Analogies.
- Venn diagram: Simple and multiple use for establishing validity of arguments.

Unit-4 Data Interpretation

- Sources, acquisition and classification of Data.
- Quantitative and Qualitative Data.
- Graphical representation (Bar-chart, Histograms, Pie-chart, Table-chart and Line-chart) and mapping of Data.
- Data Interpretation.
- Data and Governance.

Unit-5 Information and Communication Technology (ICT)

- ICT: General abbreviations and terminology.
- Basics of Internet, Intranet, E-mail, Audio and Video-conferencing.
- Digital initiatives in higher education.
- ICT and Governance.

NOTE: (i) Equal number of questions are to be set from each Unit.

(ii) Whenever graphical/pictorial question(s) are set for sighted candidates, a passage followed by equal number of questions and weightage be set for visually impaired candidates.

Part B: Department Specific Subject:

UNIT -1

Engineering Mathematics: Discrete Mathematics: Propositional and first order logic. Sets, relations, functions, partial orders and lattices. Groups. Graphs: connectivity, matching, coloring. Combinatorics: counting, recurrence relations, generating functions. Linear Algebra: Matrices, determinants, system of linear equations, eigenvalues and eigenvectors, LU decomposition. Calculus: Limits, continuity and differentiability. Maxima and minima. Mean value theorem. Integration. Probability: Random variables. Uniform, normal, exponential, poisson and binomial distributions. Mean, median, mode and standard deviation. Conditional probability and Bayes theorem.

UNIT-2

Digital Logic: Boolean algebra. Combinational and sequential circuits. Minimization. Number representations and computer arithmetic (fixed and floating point).

UNIT-3

Computer Organization and Architecture: Machine instructions and addressing modes. ALU, data-path and control unit. Instruction pipelining. Memory hierarchy: cache, main memory and secondary storage; I/O interface (interrupt and DMA mode).

UNIT-4

Programming, Data Structures & Algorithms: Programming in C. Recursion. Arrays, stacks, queues, linked lists, trees, binary search trees, binary heaps, graphs. Searching, sorting, hashing. Asymptotic worst case time and space complexity. Algorithm design techniques: greedy, dynamic programming and divide-and-conquer. Graph search, minimum spanning trees, shortest paths.

UNIT-5

Theory of Computation: Regular expressions and finite automata. Context-free grammars and push-down automata. Regular and context-free languages, pumping lemma. Turing machines and undecidability.

UNIT-6

Compiler Design: Lexical analysis, parsing, syntax-directed translation. Runtime environments. Intermediate code generation.

UNIT-7

Operating System: Processes, threads, inter-process communication, concurrency and synchronization. Deadlock. CPU scheduling. Memory management and virtual memory. File systems.

UNIT-8

Databases: ER-model. Relational model: relational algebra, tuple calculus, SQL. Integrity constraints, normal forms. File organization, indexing (e.g., B and B+ trees). Transactions and concurrency control.

UNIT-9

Computer Networks: Concept of layering. LAN technologies (Ethernet). Flow and error control techniques, switching. IPv4/IPv6, routers and routing algorithms (distance vector, link state). TCP/UDP and sockets, congestion control. Application layer protocols (DNS, SMTP, POP, FTP, HTTP). Basics of Wi-Fi. Network security: authentication, basics of public key and private key cryptography, digital signatures and certificates, firewalls.

6.2 FACULTY OF ELECTRICAL AND MECHANICAL ENGINEERING

6.2.1 DEPARTMENT OF MECHANICAL ENGINEERING (MAIN CAMPUS)

1. The Department

The Department of Mechanical Engineering (erstwhile Division of Manufacturing Processes and Automation Engineering), Netaji Subhas University of Technology (formerly Netaji Subhas Institute of Technology), New Delhi was established in the year 1995. Having a glorious history of 26 years, the Department of Mechanical Engineering has been known for its exceptionally strong Under-Graduate, Post-Graduate and Research Programmes.

The Department has always been on progressive path, thanks to the experienced and dedicated faculty members who have a strong commitment towards providing quality engineering education and research. The Department has 19 faculty members including 05 Professors, 04 Associate Professors, and 10 Assistant Professors. Most of the faculty members are doctoral degree holders.

The Department is under development to possess modern laboratories equipped with latest setups and research facilities for instrumentation, experimental stress analysis, material testing, fluid mechanics and fluid machines, computational fluid dynamics, thermal engineering, robotics, renewable energy, additive manufacturing, and flexible manufacturing systems.

The Department is also acquiring license versions of different softwares such as ANSYS, CAD/CAM, NXCAM, NX-LAD, NAX-Nastran, AUTOCAD Inventor, Catia, Creo, ABAQUS, Hyper mesh and Hyper Works, Solid Works, MDADAMS, Dynaform, etc.

2. Course Offered

The Department offers 01 Undergraduate (UG) & 02 full time Post-graduate (PG) courses, and Ph.D. programmes. The Ph.D. programmes run with University Fellowship and without fellowship. The PG courses run with GATE scholarship as well as Non-GATE category. The University provides scholarships to some of those falling under the Non-GATE category. The Department also offers Ansys Fellowship Award to 01 M.Tech student based on the performance of the student to be judged by a test/interview conducted by the Department. Under this award, a student will be provided a

scholarship/stipend of Rs. 15,000/- (Rs. Fifteen thousand only) per month for two years. Additionally, the student will get a one-time research grant of Rs. 1,50,000/- (Rs. One lakh fifty thousand only) to support final year thesis and research-based resource generation.

To keep in pace with the current technological advancements, the UG curriculum has been recently modified so that the students get a feel of what exactly is happening outside in the technical world. The B.Tech courses in Mechanical Engineering are offered with four minor areas of specialization in Automobile engineering, Computer aided design (CAD), Robotics and AI, and Manufacturing and Industrial.

- B.Tech – Mechanical Engineering (180 students – Eight Semesters – Choice Based Credit System)
- M.Tech – Mechanical Engineering (30 Students – Four Semesters – Choice Based Credit System), Full
- M.Tech – CAD/CAM (18 Students – Four Semesters – Choice Based Credit System)
- Doctor of Philosophy (Ph.D.)

3. Areas of Research and Available Vacancies

3.1 Tentative Seats:

For the session 2022-23 (Even semester), the maximum number of seats in the Department of Mechanical Engineering is limited to

- (i) **Seats with University Fellowship : 08**
- (ii) **Seats without University Fellowship: 02**

University reserves the right to change the number of seats.

***The table below indicates the maximum number of vacancies available in various areas of research. However, the total number of seats is as given above.**

S. No.	Area of Research	Name of the Faculty	No. of candidates to be taken in coming session	
			With University Fellowship	Without University Fellowship
01	Advanced manufacturing processes,	Prof. Sanjay Kumar Chak	02	NIL

	Micromachining, Hybrid machining and Additive manufacturing			
02	Industrial Engineering and Management, Thermal and Fluid Sciences	Prof. D.K. Singh	02	NIL
03	Mechanics of Smart materials, biomaterials, and sandwich structures, Nonlinear dynamics.	Dr. Simran Jeet Singh	01	01
04	Laser material processing	Dr. Shashi Prakash	NIL	01
05	Green Composites, Modeling and Simulation of PMCs, Processing of polymer Composites	Dr. P.K.Bajpai	01	NIL
06	Tribology, Fluid-film bearings, Smart lubricants	Dr. Vivek Kumar	01	NIL
07	Advanced Polymer Composites, Smart materials	Dr. Vinay Panwar	01	NIL

4. Faculty Profile

4.1. Dr. D.K. Singh

1. **Designation, Qualification:** Professor and Head, Ph.D.
2. **Areas of Interest:** Supply Chain Management, JIT, Lean Manufacturing, Thermal and Fluid Systems.
3. **List of Publications:**
 - a. Achhaibar Singh and **D. K. Singh**, “An Investigation on the Forced Convection Heat Transfer in the Gap of Two Rotating Disks with



Laminar Flow”, *Heat Transfer* (Wiley), Volume 50, Issue 7, pp.6964-6983, Nov. 2021, (<https://doi.org/10.1002/htj.22212>), Online published: **22-06-2021**, (Impact factor – 2.42) [**ESCI**].

- b. Achhaibar Singh and **D.K. Singh**, “An Investigation on Forced Convection in Clearance of Corotating Disks with Diverging Laminar Flow”, *Journal of Fluids Engineering* (ASME), 143 (3), 034502 (5 pages), **March 2021**. (<https://doi.org/10.1115/1.4049112>), (Impact factor – 2.056) [**SCI**].
- c. Laxmi Narain and **D.K. Singh**, “Direct Normal Irradiance Predictions using Broadband Models for Indian Stations”, *Energy Reports*, Vol. 6, No. 2, **2020**, pp. 572-576 (Impact factor - 6.87) [**SCIE**].

4. **E-mail:** dks662002@yahoo.com

5. **Phone:** 011-25099034, (M): + 91- 9899079969

6. **Home page:** <http://nsut.ac.in/faculty/dks/>

7. Bio-Sketch: Dr. D.K. Singh is a Professor and Head of the Department. He has published over 50 research papers in the reputed National and International journals and in the proceedings of National and International Conferences. He has also written 12 books. His books are published from CRC Press, Springer, and Pearson.

4.2. Dr. Sachin Maheshwari

1. **Designation, Qualification:** Professor, Ph.D.

2. **Areas of Interest:** Welding.

3. **List of Publications:**

- a. C S Verma, Naresh Kr Sharma, Vijayaraghavan M Chariar, **S. Maheshwari**, M K Hada. “Comparative Study of Mechanical Properties of Bamboo Laminae and their Laminates with Woods and Wood based Composites.” *Journal of Composite Part: B*, Volume 60, April 2014, Pages 523–530.
- b. Naveen Beri, **S. Maheshwari**, C. Sharma, A. Kumar, “Surface Quality Modification Using Powder Metallurgy Processed CuW Electrode During Electric Discharge Machining of Inconel 718” *Procedia Materials Science*, Elsevier, Volume 5, 2014, Pages 2629–2634.



- c. A. Kumar, H. Singh, **S. Maheshwari**, Element Transfer Study of Developed Agglomerated Fluxes during Submerged Arc Welding” Indian Welding Journal 47, no. 1 (2014).
4. **E-mail:** ssaacchhiinn@gmail.com, sachin_iitd@hotmail.com
5. **Phone:**+91- 9810174004
6. **Home page:** <http://nsut.ac.in/faculty/sm/>

7. Bio-Sketch: Dr. Sachin Maheshwari is a Professor in the Department. He has published over 19 research papers in the reputed National and International journals, and in the proceedings of National and International Conferences.

4.3. Dr. Sanjay Kr. Chak



1. **Designation, Qualification:** Professor, Ph.D.
2. **Areas of Interest:** Advanced manufacturing processes, Micromachining, Hybrid machining and Additive manufacturing.
3. **List of Publications:**
 - a. Vani V. V., **Chak S. K.**, “The effect of process parameters in Aluminium Metal Matrix Composites with Powder Metallurgy”, Int. Journal of Manufacturing Review, Vol. 5, No. 7, June 2018, (e ISSN:2265-4224).
 - b. **Chak S. K.**, “**Electro Chemical Discharge Machining: Process Capabilities**”, Int. Journal of mechanical and production engineering (IJMPE), Vol. 4, No. 8, Aug. 2016, 135-146. (ISSN: 2320-2092).
 - c. **Chak S. K.**, “**Spark-assisted electrochemical drilling of ceramics**”, Int. Journal of Precision Technology (IJPT), Vol. 6, No. 2, (2016), 171-189. (Print ISSN: 1755-2060, Online ISSN: 1755-2079).
4. **E-mail:** sanjaykchak@yahoo.com, sanjaykchak@gmail.com
5. **Phone:** 91- 9810287855
6. **Home Page:** <http://nsut.ac.in/faculty/skc/>

7. Bio-Sketch: Dr. S.K. Chak is a Professor in the Department. He has published over 10 research papers in the reputed National and International journals and in the proceedings of National and International Conferences.

He also worked as a Principal Investigator in a D.S.T. (Department of Science and Technology, Govt. of India) sponsored project titled 'Influence of process parameters in electrochemical spark machining'. His area of research is electro chemical discharge machining process.

4.4. Dr. S. K. Jha



1. **Designation, Qualification:** Professor, Ph.D.
2. **Areas of Interest:** Grinding of difficult-to-machine materials with wheels containing diamond abrasives, EDM-based Hybrid Process for machining of binderless/single phase nanostructured WC material, Dry machining.
3. **List of Publications:**
 - a. **S.K.Jha**, R.M.Strelchuk, M.D.Uzunyan, “Esledovaniye e AnalizSherokhobamoschiPoverkhnoschiPriShliphobanieNanosmrtukmyrnikhTvyordikhSplavov (Research and Analysis of the Surface Roughness in Grinding of Nanostructured Hard Materials”, International Scientific Technical Collection, Cutting & Tools in Technological System, Issue/Edition No.79, ISSN 2078-7405,2011, pp.46-51 (in Russian).
 - b. Choudhary S., Doon R., **Jha S.K.** (2019) Prediction of the Material Removal Rate and Surface Roughness in Electrical Discharge Diamond Grinding Using Best-Suited Artificial Neural Network Training Technique. In: Malik H., Srivastava S., Sood Y., Ahmad A. (eds) Applications of Artificial Intelligence Techniques in Engineering. Advances in Intelligent Systems and Computing, vol 697. Springer, Singapore.
 - c. Gaurav Bhadauria, **S.K. Jha**, B.N. Roy, Nonihal Singh Dhakry, Electrical-Discharge Machining of Tungsten Carbide (WC) and its composites (WC-Co) – A Review , Materials Today: Proceedings, Volume 5, Issue 11, Part 3, 2018, Pages 24760-24769.
4. **E-mail:** skjha63@rediffmail.com
5. **Phone:** +91- 9650286135
6. **Homepage:** <http://nsut.ac.in/faculty/shail/>

7. Bio-Sketch: Dr. S.K. Jha is a Professor in the Department. He has published over 20 research papers in the reputed National and International

journals and in the proceedings of National and International Conferences. His area of research is EDM –based Hybrid Process for machining of difficult-to-machine conventional and nanostructured Materials.

4.5. Dr. Vijyant Aggarwal

1. **Designation, Qualification:** Professor, Ph.D.
2. **Areas of Interest:** Robotics, Artificial Intelligence, Industrial Engineering and Management.
3. **List of Publications:**
 - a. **Vijyant Aggarwal**, “Trajectory planning of redundant manipulator using fuzzy clustering method”, The International Journal of Advanced Manufacturing Technology (Springer; Impact factor 1.5), 61,727-744, July 2012.
 - b. **Vijyant Aggarwal** and Harish Parthasarathy, “Disturbance Estimator as a State Observer with Extended Kalman Filter for Robotic Manipulator”, Nonlinear Dynamics (Springer; Impact factor: 3), 84(4), pp 1-17, 2016.
 - c. Rohit Singla, **Vijyant Aggarwal** and Harish Parthasarathy, Rohit Rana “Feedback Optimization Problem for Master-Slave Teleoperation Tracking in the Presence of Random Noise in Dynamics and Feedback”, Nonlinear Dynamics (Springer; Impact factor: 3), doi: 10.1007/s11071-016-2908-9, 1-28, 2016.4.
4. **E-mail:** vijyant@nsit.ac.in
5. **Phone:** +91- 9899308574
6. **Homepage:** <http://nsut.ac.in/faculty/va/>
7. **Bio-Sketch:** Dr. Vijyant Aggarwal is a Professor in the Department. He has published over 35 research papers in the reputed National and International journals and in the proceedings of National and International Conferences.



4.6. Dr. Aditya Kumar

1. **Designation, Qualification:** Associate Professor, Ph.D.
2. **Areas of Interest:** Advance welding systems such as Friction stir welding, TIG Welding, MIG Welding, SAW.
3. **List of Publications:**



- a. **Aditya Kumar**, Sachin Maheshwari “Some study of arc stability in submerged arc welding for SiO₂ based flux system”, International Journal of Applied Engineering Research, Volume 10,no. (50), ISSN 0973, 2015, pp-595-599.
 - b. **Aditya Kumar** “Optimization of flux constituents for low carbon steel plates based on the weld bead width with Taguchi analysis by submerged arc welding process”, International Journal of Mechanical and Production Engineering, ISSN 2320-2092, Volume -3, Issue-7, 2015, pp-114-117.
 - c. **Aditya Kumar** “Arc stability study of submerged arc welding for SiO₂ and TiO₂ based flux systems”, Journal of Material Science and Mechanical Engineering, ISSN: 2393-9109, Vol-2, No.-9, April-June-2015, pp-35-40.
4. **E-mail:** aditya_rathihere@yahoo.com, aditya.kumar@nsut.ac.in, aditya9rathi@gmail.com
 5. **Phone:** 011-25000208
 6. **Home Page:** <http://www.nsit.ac.in/faculty/aditya>

7. Bio-Sketch: Dr. Aditya Kumar is Associate Professor in the Department. He has published 10 papers in International Journals, 8 papers in International and National Conferences.

4.7. Dr. A. V. Muley

1. **Designation and Qualification:** Associate Professor, Ph.D.
2. **Areas of interest:** Composite materials, Nano composites, Hybrid composites, Tribology of composite materials, Production and Industrial Engineering.
3. **List of Publications**



- a. **A.V. Muley**, S. Aravindan, I. P. Singh, "Nano and hybrid aluminum based metal matrix composites: an overview", Manufacturing Rev. 2015, 2, 15.
- b. **A.V. Muley**, S. Aravindan, I. P. Singh, "Mechanical and tribological studies on nanoparticles reinforced hybrid aluminum based composite", Manufacturing Rev. 2015, 2, 26.
- c. Jayant K. Jha and **A. V. Muley**, "Polymer matrix nanocomposite; Processing, Challenges and Application", International conference on innovative research on mechanical, materials, industrial, automotive, aeronautical and nano- technology, (MIANT-2018), Jawaharlal Nehru University, New Delhi, 29th April 2018.

4. **E-mail:** avmuley2000@yahoo.com
5. **Phone No.** 011-25000192
6. **Home page:** <http://nsut.ac.in/faculty/avm/>

7. Bio-Sketch: Dr A. V. Muley is an Associate Professor in the Department.

4.8. Dr. Pradeep Khanna

1. **Designation, Qualification:** Associate Professor, Ph.D.
2. **Areas of Interest:** Welding, Mechanized Feeding, Low Cost Automation and Quality Control.
3. **List of Publications:**
 - a. **Pradeep Khanna** and Sachin Maheshwari, "Microhardness Analysis in MIG Welding of Stainless Steel 409M". Journal of Production Engineering, Vol. 20 (1) pp. 93 - 96, April 2017.
 - b. Ayush Raj, Daksh Narang and **Pradeep Khanna**, "Graphical Analysis of a Vibratory Bowl Feeder for Spherical Washers". Journal of Material Science and Mechanical Engineering, Vol. 4, Issue 2, pp. 110-113, April-June, 2017.
 - c. **Pradeep Khanna** and Sachin Maheshwari, "Development of Mathematical Models for Prediction and Control of Weld Bead Dimensions in MIG Welding of Stainless Steel 409M". Materials Today: Proceedings, Elsevier, Vol. 5, Issue 2, part- 1, pp. 4478-4488, 2018.



4. **E-mail:** 4.khanna@gmail.com
5. **Phone:** 91-9818388160
6. **Home page:** <http://www.nsut.ac.in/faculty/prk/>

7. Bio-Sketch: Mr. Pradeep Khanna is an Associate Professor in the Department. He has published more than 90 research papers in reputed National, International Journals and Conferences. His research interests are in the areas of Welding, Mechanized Feeding, Low cost automation and Quality control.

4.9. Mr. Sanjay Gupta

1. **Designation, Qualification:** Associate Professor, M.E.
2. **Areas of Interest:** CAD/CAM, Product Design, Supply chain management
3. **List of Publications:**
 - a. Piyush and **Sanjay Gupta**, “Statistical Modeling approach for minimizing stresses Developed in Bolted rail joint”, journal of production engineering, vol. 21(1), pp. 33-39,2018.
 - b. Piyush and **Sanjay Gupta**, “Stress analysis of bolted joint using finite element analysis”, International journal of research in engineering and technology, vol. 6, issue 1(1), pp 38-46, January 2017.
 - c. Shubham Gupta, Pradeep Khanna and **Sanjay Gupta**, “Design and Development of an Automated Industrial Component Sorting System with Digital Image Processing” Vth International Symposium on “Fusion of Science & Technology”, New Delhi, India, January 18-22, pp. 339-345, 2016.
4. **E-mail :** sanjay_gup@rediffmail.com, sanjaygw1@gmail.com
5. **Phone:** (M) 91- 9868160243, (O) 011-25000194
6. **Home page:** <http://nsut.ac.in/faculty/sang/>



Bio-Sketch: Mr. Sanjay Gupta is an Associate Professor in the Department.

4.10 Dr. Abhishek Tevatia

1. **Designation, Qualification:** Assistant Professor, Ph.D.
2. **Areas of Interest:** Finite element fatigue analysis of structures, Modeling of fatigue cracks in composite materials, Design sensitivity and uncertainty analysis, Advance computational modeling techniques.
3. **List of Publication:**
 - a. **Tevatia** and S.K. Srivastava, Influence of micro-structural parameters on fatigue life of discontinuous reinforced metal matrix composites, Indian Journal of Engineering and Material Science (Accepted).
 - b. **Tevatia** and S.K. Srivastava, The energy-based multistage fatigue crack growth life prediction model for DRMMCs, Fatigue and Fracture of Engineering Materials and Structures, pp. 1-11, 2018; <https://doi.org/10.1111/ffe.12853>.
 - c. **Tevatia**, Sensitivity analysis of fatigue crack growth life prediction model for discontinuous reinforced metal matrix composites, International Journal of Engineering Technology Science and Research, Vol. 5, Issue 5, pp. 293-296, 2018.
4. **E-mail :** abhishek_tevatia@yahoo.co.in; abhishek.tevatia@nsit.ac.in
5. **Phone:** +91- 8285464820
6. **Home Page:** <http://www.nsit.ac.in/faculty/abt/>
7. **Bio-Sketch:** Dr. Abhishek Tevatia is an Assistant Professor in the Department. He has over 20 publications in peer-reviewed journals and conferences.



4.11. Dr. P. K. Bajpai

1. **Designation, Qualification:** Assistant Professor, Ph.D.
2. **Areas of Interest:** Primary and Secondary Processing of Composite Materials, Characterization of Composite Materials, Natural fiber Reinforced Polymer Matrix, Green Composites.
3. **List of Publications:**
 - a. **Pramendra Kumar Bajpai**, Inderdeep Singh, Jitendra Madaan, Joining of Natural Fiber Reinforced Composites



using Microwave Energy: Experimental and Finite Element Study, Materials and Design, 35, 2012, 596-602.

- b. **Pramendra Kumar Bajpai**, Dharmendra Meena, ShreyVatsa, Inderdeep Singh, Tensile Behaviour of Nettle Fiber Composites Exposed to Various Environments, Journal of Natural Fibers, 10, 2013, 244-256.
- c. **Pramendra Kumar Bajpai**, Inderdeep Singh, Jitendra Madaan, Tribological Behaviour of Poly Lactic Acid (PLA) based Green Composites, Wear, 297, 829-840.

4. **E-mail:** pramendra.pk@gmail.com, pramendra.bajpai@nsut.ac.in

5. **Phone:**91- 9911699011

6. **Home:** <http://nsut.ac.in/faculty/pkb/>

7. Bio-Sketch: Dr. Pramendra Kumar Bajpai is an Assistant Professor in the Department. His areas of research include processing of polymer composites and green composites, machining aspects of composites, FEM modelling of composites etc. He has published 09 research articles in various journals of repute. He has contributed many book chapters in the edited books of various publishers like Springer, Taylor and Francis, CRC Press, Wiley, Nova, etc.

4.12 Dr. Umang Soni

1. **Designation, Qualification:** Assistant Professor, Ph.D.
2. **Areas of Interest:** Supply chain Management, Optimization Techniques, Decision Making, Stochastic Modeling, Artificial Intelligence.
3. **List of Publications:**

- a. Jain, V., Kumar, S., **Soni, U.**, & Chandra, C. (2017). Supply chain resilience: model development and empirical analysis. International Journal of Production Research, 55(22), 6779-6800.
- b. Gautam, Aditya, Surya Prakash, and **Umang Soni**. "Supply chain risk management and quality: a case study and analysis of Indian automotive industry." International Journal of Intelligent Enterprise 5.1-2 (2018): 194-212.



- c. **Soni, Umang**, et al. "Forecasting municipal solid waste generation using artificial intelligence models—a case study in India." Springer Nature Applied Sciences 1.2 (2019): 162.
4. **E-mail:** umangsoni.1@gmail.com, umangsoni.iitd@gmail.com
5. **Phone:** +91- 9717719143
6. **Home:** <http://www.nsit.ac.in/faculty/ums/>
7. **Bio-Sketch:** Dr. Umang Soni is an Assistant in the Department. He has published more than 15 research papers in reputed International Journals like International Journal of Production Research, Computers and Industrial Engineering, Springer Nature and Applied Sciences and various Proceedings of International and National Conferences like IEEE, Springer, Elsevier and Procedia Computer science. His research interests include Supply Chain Management, Operations Management, Optimization Techniques, Decision Making, Stochastic Modeling, and Artificial Intelligence.

4.13 Dr. Andriya Narasimhulu

1. **Designation, Qualification:** Assistant Professor, Ph.D.
2. **Areas of Interest:** Metal cutting, Machining of Titanium alloys, Additive Manufacturing, Design for Manufacturing and Assembly.
3. **List of Publications:**
 - a. Jayant Kumar Jha and **AndriyaNarasimhulu** (2018/09) “A Critical Review of Process Parameters of Fused Deposition Modeling”, Journal of Material Science and Mechanical Engineering (JMSME), 5(3), Pg: 138-141, ISSN: 2393-9095; e-ISSN: 2393-9109.
 - b. **Andriya, Narasimhulu.**, Venkateswara Rao, P., Sudarsan Ghosh., “Dry Machining of Ti-6Al-4V using PVD coated TiAlN Tools”. Proceedings of the World congress on engineering of The 2012 International Conference of Manufacturing Engineering and Engineering Management (WCE'12, ICMEM), London, U.K., 2012: p. 1492-1497.



- c. Chetan, **Narasimhulu, A.**, Ghosh, S., Rao, P. V. (2015). "Study of Tool Wear Mechanisms and Mathematical Modeling of Flank Wear During Machining of Ti Alloy (Ti6Al4V)." Journal of The Institution of Engineers (India): Series C 96(3): 279-285. ISSN: 2250-0545; DOI: 10.1007/s40032-014-0162-9.

4. **E-mail:** andriya@nsut.ac.in, narasimha.iitdelhi@gmail.com
5. **Phone:** 011-25000252, 91- 9899518264
6. **Home Page:** <http://nsut.ac.in/faculty/anr/>

Bio-Sketch: Dr. AndriyaNarasimhulu is an Assistant Professor in the Department. He has published 13 research papers in various International journals and conferences. His research interests include Metal cutting, Machining of Titanium alloys, Additive Manufacturing, Design for Manufacturing and Assembly.

4.14 Mr. Narender Kumar

1. **Designation, Qualification:** Assistant Professor, M. Tech., Ph.D. (Pursuing)
2. **Areas of interest:** Advanced Machining Processes, Machining of Advanced materials, Composite materials.
3. **E-mail:** narender.kumar@nsut.ac.in
4. **Phone:** 011-25000075
5. **Home page:** <http://www.nsit.ac.in/faculty/nrk/>



Bio-Sketch: Mr. Narender Kumar is an Assistant Professor in the Department. He is pursuing his Ph.D. from University of Delhi.

4.15 Dr. Shashi Prakash

1. **Designation, Qualification:** Assistant Professor, Ph.D. (IIT Patna)
2. **Areas of interest:** Laser material processing, laser micromachining, bio-microfluidics, manufacturing processes, adhesive bonding, surface engineering

3. List of Publications:



- a. **Shashi Prakash**, Siddharth Suman, Neural network based prediction for surface characteristics in CO₂ laser micro-milling of glass fiber reinforced plastic composite, Neural Computing and Applications, (2021). <https://doi.org/10.1007/s00521-021-05818-w>
- b. **Shashi Prakash**, Subrata Kumar, Determining the suitable CO₂ laser based technique for microchannel fabrication on PMMA, July 2021, Optics & Laser Technology 139(2):107017 DOI: 10.1016/j.optlastec.2021.107
- c. **Shashi Prakash**, Experimental investigation of surface defects in low-power CO₂ laser engraving of glass fiber-reinforced polymer composite, Polymer Composites, 2019; Wiley, 1-12.

4. **Email:** shashi.prakash@nsut.ac.in

5. **Phone:** +91-7765802528

6. **Homepage:** <http://www.nsut.ac.in/faculty/shp/>

7. **Bio-sketch:** Dr. Shashi Prakash is an Assistant Professor in the Department. He did his PhD in Mechanical Engineering from IIT Patna. He has received a university gold medal from Jadavpur University, Kolkata for securing 1st rank in Master of Production Engineering (ME). He has obtained his B.Tech. degree in Mechanical Engineering from V.B.S. Purvanchal University, Jaunpur. He was awarded DST-INSPIRE fellowship (2011) from DST, Gov. of India. He has also received the most cited author award (India) (2018) from IOP Science and IJPEM-Springer. He is working on research projects funded by DST and BRNS as PI and Co-PI. He has published over 18 international journals, 18 international conferences and 03 book chapters.

4.16 Dr. Vinay Panwar

1. **Designation, Qualifications:** Assistant Professor, Ph.D. (IIT Roorkee), M.Tech. (IIT Kanpur)

2. **Areas of Interest:** Polymer composites; Nanomaterials; Synthesis, modifications & characterizations; Modeling & simulation

3. **E-mail:** vinay.panwar@nsut.ac.in ; vinaypanwar86@gmail.com

4. **Phone:** +91-9005863329

5. **List of Publications:**



- a. **Vinay Panwar** and Kaushik Pal. An optimal reduction technique for rGO/ABS composites having high-end dynamic properties based on Cole-Cole plot, degree of entanglement and C-factor. *Composites Part B: Engineering*, 2017, 114, 46-57. DOI.org/10.1016/j.compositesb.2017.01.066, ISSN: 1359-8368.
- b. **Vinay Panwar**, Ananya Chattree and Kaushik Pal. A new facile route for synthesizing graphene oxide using a mixture of sulphuric-nitric-phosphoric acids as an intercalating agent. *Physica E: Low-dimensional Systems and Nanostructures*, 2015, 73, 235-241. DOI:10.1016/j.physe.2015.06.006, ISSN: 1386-9477.
- c. **Vinay Panwar** and Kaushik Pal. Influence of addition of selective metallic species on mechanical properties of graphene/acrylonitrile-butadiene-styrene composites. *Polymer Composites*, 2020, 41 (4), 1636-1648. DOI.org/10.1002/pc.25485, ISSN:1548-0569.

6. Bio-Sketch: Dr. Vinay Panwar is an Assistant Professor in the Department. He has completed the Doctorate (Ph.D.) from Indian Institute of Technology Roorkee, India in December 2017 and Master's in Materials Science from Indian Institute of Technology Kanpur, India in 2013. He has done his Bachelor's in Mechanical Engineering and was awarded by the honours degree, upon completion, in 2010. In addition to teaching, Dr. Panwar is actively involved in research activities and supervising Ph.D. students. His research interests turns around the 'Development of Advanced Materials' and specifically related to the 'synthesis and modifications of nanomaterials; polymer composites; energy applications; modeling and simulation; physical characterizations and experimental analysis for micro-/nano-materials'. He has published around 25 research articles in journals of well repute (SCI/SCIE/Scopus) and 3 book chapters, till date

4.17 Dr. Vivek Kumar

1. **Designation, Qualification:** Assistant Professor, Ph.D.
2. **Areas of Interest:** Tribology, Modeling and Simulation of Fluid Film Bearings, Smart Lubricants and Structures, Bionic Surfaces and Textured Surface Bearings.
3. **List of Publications:**



- a. **Vivek Kumar** and Satish C. Sharma, "Dynamic characteristics of compensated hydrostatic thrust pad bearing subjected to external transverse magnetic field", *Acta Mechanica*, Vol. 229.3 (2018):1251-1274.
- b. **Vivek Kumar** and Satish C. Sharma, "Influence of dimple geometry and micro-roughness orientation on performance of textured hybrid thrust pad bearing", *Meccanica*, Vol. 53.14 (2018): 3579-3606.
- c. **Vivek Kumar** and Satish C. Sharma, "Performance analysis of rough surface hybrid thrust bearing with elliptical dimples." *Proceedings of the Institution of Mechanical Engineers, Part J: Journal of Engineering Tribology*, Vol. 235.6 (2021):1101-1113.

4. E-mail: vivek.kumar@nsut.ac.in, vkd456@gmail.com

5. Phone: + 91- 8532901455

6. Bio-Sketch: Dr. Vivek Kumar is an Assistant Professor in the Department. Previously, he had served as an Assistant Professor in the Department of Mechanical Engineering, Pandit Deendayal Energy University Gandhinagar, Gujarat (2019-2021) and Galgotias University, Greater Noida (2013-2015). He received his B.E. in Mechanical Engineering from C.R State college of Engineering Murthal, Sonipat. He had also worked as Design Engineer in Machine Building (MBD) of ISGEC Yamunanagar from 2007 to 2010. He did Masters in Design of Mechanical Equipment from Mechanical Engineering Department at Indian Institute of Technology (IIT) Delhi in 2013. He received his Ph.D. in Mechanical Engineering from Indian Institute of Technology Roorkee in 2019. Dr. Kumar's research is focused on modeling and advanced simulations of fluid film bearings, non-Newtonian lubricants and smart lubricants. Recent thrusts have centered on application of smart lubricants, bionic and textured surfaces in fluid film bearings. His research works draw heavily on expertise in simulation of fluid film bearing, smart lubricants and structures, structure-property relationships in fluid flows, numerical techniques for non-linear bearing systems.

4.18 Dr. Swati Gangwar

1. **Designation, Qualification:** Assistant Professor, Ph.D.
2. **Areas of Interest:** Composite materials, Tribology and Materials Characterizations



3. List of Publications:

- a. **Swati Gangwar**, Sukriti Yadav, Vimal Kumar Pathak **(2021)** Optimized selection of nanohydroxyapatite (n-HAP) filled dental restorative composites formulation for best physico-mechanical, chemical, and thermal properties using hybrid AHP-MOORA approach, **Polymer Composite** <https://doi.org/10.1002/pc.26097>, **May 2021, I.F. – 2.265 (SCI)**
- b. Swati Gangwar, Pratibha Arya, Vimal Kumar Pathak, **(2020)** Optimal Material Selection for Ship Body Based on Fabricated Zirconium Dioxide/ Silicon Carbide Filled Aluminium Hybrid Metal Alloy Composites Using Novel Fuzzy Based Preference Selection Index, **Silicon, Springer, I.F. – 1.499 (SCI)**
- c. **Swati Gangwar**, Vimal Kumar Pathak, **(2020)** A critical review on tribological properties, thermal behavior, and different applications of industrial waste reinforcement for composites, **Proceedings of the Institution of Mechanical Engineers, Part L: Journal of Materials: Design and Applications, SAGE publications I.F. – 2.014 (SCIE)**
4. **E-mail:** swati.gangwar@nsut.ac.in, gangwar.swati@gmail.com
5. **Phone:** +91-8795977174
6. **Home Page:** <http://www.nsit.ac.in/faculty/sg/>
7. **Bio-Sketch:** Dr. Swati Gangwar is an Assistant Professor in the Department. She has published more than 80 papers in peer reviewed Journals and International/national conferences (25 SCI/SCIE). She has authored 05 book chapters in reputed International/national publishers. She has guided 22 M.Tech. Students and awarded 02 Ph.D. Students.

4.19 Dr. Simran Jeet Singh

1. **Designation, Qualification:** Assistant Professor, Ph.D.
2. **Areas of Interest:** Structural dynamics, Bio-inspired materials, Smart materials, Vibration and Control, Functionally Graded Materials, Sandwich Structures, Semi-analytical methods, Computational Mechanics.
3. **List of Publications:**



- a. **S. J. Singh**, S. P. Harsha. Thermo-mechanical analysis of porous sandwich S-FGM plate for different boundary conditions using GalerkinVlasov's method: A semi-analytical approach. *Thin-Walled Structures*, Elsevier, Vol. 150, pp.106668, 2020.
- b. **S. J. Singh**, S. P. Harsha. Nonlinear dynamic analysis of sandwich S-FGM plate resting on Pasternak foundation under thermal environment. *European Journal of Mechanics-A/Solids*, Elsevier, Vol. 76, pp.155-179, 2019.
- c. **S. J. Singh**, S. P. Harsha. Analysis of porosity effect on free vibration and buckling responses for sandwich sigmoid function based functionally graded material plate resting on Pasternak foundation using GalerkinVlasov's method. *Journal of Sandwich Structures & Materials*, SAGE, Vol. 23, pp.1717-1760, 2021.

4. **E-Mail:** simranjeet.singh@nsut.ac.in, jeetsingh.simran@gmail.com

5. **Phone:** +91-9780371369

6. **Bio-Sketch:** Dr. Simran Jeet Singh is an Assistant Professor in the Department. He did his Ph.D. from IIT Roorkee in the year 2019 in the field of smart materials and sandwich structures. He received Master degree from NIT Kurukshetra and Bachelor degree from Kurukshetra University in Mechanical Engineering in the year 2013 and 2009, respectively. He is a recipient of Gold Medal for being the best graduating student of the year 2013 from NIT Kurukshetra. His research interests include nonlinear static and dynamic analysis of structures, study of perfect and imperfect smart structures, semi-analytical methods etc. He has published in more than 15 peer reviewed international journals and conference proceedings. He is also a recipient of the best paper award from the conference. He has 6.5 years of teaching experience and is also involved in consultancy project work from different government agencies such as THDC-Tehri, BHEL-Haridwar, RDSO-Lucknow.

5 Laboratory Infrastructure

5.1. CAD/CAM Lab

The lab meets the challenges of the upcoming manufacturing technologies and optimizing design of machine tools. This lab has facilities for imparting CAD/CAM/CAE related services & training of different software and modules.

The lab software facilities include Auto-CAD, Uni-Graphics, ALTAIR, HYPERWORKS, CATIA, MATLAB, Dev C++, PYTHON.

5.2. Additive Manufacturing Lab

The lab for additive manufacturing is equipped with a printer for additive manufacturing with PLA and ABS. The laboratory is used by researchers and students in projects or as part of Master's theses. The department also has printers for additive manufacture with plastic materials to be used by students, more or less freely. Additive Manufacturing Lab engages post graduate students related to performing solid based additive manufacturing experiments to build the product directly from the 3D model. The motive of this Lab is Dream it, design it and Print it in 3D.

The Metal additive manufacturing lab is under development to generate 3D models, render machine build-code, manufacture metal AM parts, and recycle metal powder. The technology in use is Selective Laser Melting, where fine metal particles are melted and resolidified together layer by layer. This process opens new opportunities for research and production of novel designs.

5.3. Advanced Welding Lab.

This lab has welding machines that can be used for research work by U.G, P.G and Ph.D. students. The lab consists of Data Acquisition System attached with SAW to study the metal transfer and arc stability. The system has a multichannel recording facility that can be used for variation in voltage, current, temperature.

5.4. Industrial Engineering Lab

The experiments and exercises developed in the lab are related to a number of aspects and issues, such as principles of method study, fraction defective and to check the control of the process, time study of assembly and machining jobs, determine the process capability, measure the skill and dexterity, forecasting, measurement and analysis of work and recovery cycles for jobs, measurement and analysis of ergonomic variables and work illumination design, decision making.

The laboratory courses such as operations research, industrial engineering, artificial intelligence and industrial statistics and forecasting are conducted in this laboratory. Currently this lab is equipped with 30 Desktops, 1 network printer, and software like MATLAB.

Research focus of this lab is Logistics and Supply Chain Management, Decision making, Fuzzy logic, Artificial Intelligence based methods,

Stochastic models, Optimization: Models, theory and algorithms, Simulation, Modeling and Analysis, Recommender Systems, Social Network Analysis, etc.

6. ELIGIBILITY WITH RESPECT TO BACHELORS & MASTERS DEGREE.

List of Degrees in B. Tech./B.E./B.Sc. Engg. Considered for admission

1. Mechanical Engineering
2. Manufacturing Processes and Automation Engineering
3. Production Engineering
4. Mechanical and Automation Engineering
5. Tool Engineering
6. Mechatronics

With M. Tech. specialization in any of the branches mentioned below.

1. Manufacturing and Automation
2. Manufacturing Engineering
3. Manufacturing Engineering and Automation
4. Manufacturing Engineering and Technology
5. Manufacturing Processes
6. Manufacturing Processes and Automation Engineering
7. Manufacturing Technology and Automation
8. Mechanical and Automation
9. Mechanical (Computer Aided Design, Manufacture and Engineering
10. Mechanical Engineering (CAD/CAM)
11. Mechanical Engineering- Production
12. Mechanical Engineering- Design
13. Mechanical Engineering
14. Mechatronics
15. Mechanical-Manufacturing Engineering
16. Production Engineering
17. Production and Industrial Engineering
18. Production Technology

7. SYLLABUS FOR WRITTEN TEST.

The entrance test shall consist of 100 multiple choice questions. There shall be no negative marking. 50 questions shall be based on Research Aptitude/Methodology which shall include quantitative methods/computer applications, experimental techniques etc. and 50 questions shall be subject specific. The test shall be of Two hours.

Part A Research Aptitude/Methodology:

Unit-1 Research Aptitude

- Research: Meaning, Types, and Characteristics, Positivism and Post-positivistic approach to research.
- Methods of Research: Experimental, Descriptive, Historical, Qualitative and Quantitative methods.
- Steps of Research.
- Thesis and Article writing: Format and styles of referencing.
- Application of ICT in research.
- Research ethics.

Unit-2 Comprehension & Communication

- A passage of text be given. Questions be asked from the passage to be answered.
- Communication: Meaning, types and characteristics of communication.
- Effective communication: Verbal and Non-verbal, Inter-Cultural and group communications, Classroom communication.
- Barriers to effective communication.
- Mass-Media and Society.

Unit-3 Mathematical Reasoning and Aptitude

- Types of reasoning.
- Number series, Letter series, Codes and Relationships.
- Mathematical Aptitude (Fraction, Time & Distance, Ratio, Proportion and Percentage, Profit and Loss, Interest and Discounting, Averages etc.) Unit-VI Logical Reasoning
- Understanding the structure of arguments: argument forms, structure of categorical propositions, Mood and Figure, Formal and Informal fallacies, Uses of language, Connotations and denotations of terms, Classical square of opposition.
- Evaluating and distinguishing deductive and inductive reasoning.
- Analogies.
- Venn diagram: Simple and multiple use for establishing validity of arguments.

Unit-4 Data Interpretation

- Sources, acquisition and classification of Data.

- Quantitative and Qualitative Data.
- Graphical representation (Bar-chart, Histograms, Pie-chart, Table-chart and Line-chart) and mapping of Data.
- Data Interpretation.
- Data and Governance.

Unit-5 Information and Communication Technology (ICT)

- ICT: General abbreviations and terminology.
- Basics of Internet, Intranet, E-mail, Audio and Video-conferencing.
- Digital initiatives in higher education.
- ICT and Governance.

NOTE: (i) Equal number of questions are to be set from each Unit.

(ii) Whenever graphical/pictorial question(s) are set for sighted candidates, a passage followed by equal number of questions and weightage be set for visually impaired candidates.

PART- B

Unit 1 Engineering Mechanics: Free-body diagrams and equilibrium; trusses and frames; virtual work; kinematics and dynamics of particles and of rigid bodies in plane motion; impulse and momentum (linear and angular) and energy formulations, collisions.

Unit 2 Mechanics of Materials: Stress and strain, elastic constants, Poisson's ratio; Mohr's circle for plane stress and plane strain; thin cylinders; shear force and bending moment diagrams; bending and shear stresses; deflection of beams; torsion of circular shafts; Euler's theory of columns; energy methods; thermal stresses; strain gauges and rosettes; testing of materials with universal testing machine; testing of hardness and impact strength.

Unit 3 Theory of Machines: Displacement, velocity and acceleration analysis of plane mechanisms; dynamic analysis of linkages; cams; gears and gear trains; flywheels and governors; balancing of reciprocating and rotating masses; gyroscope.

Unit 4 Vibrations: Free and forced vibration of single degree of freedom systems, effect of damping; vibration isolation; resonance; critical speeds of shafts.

- Unit 5 Machine Design:** Design for static and dynamic loading; failure theories; fatigue strength and the S-N diagram; principles of the design of machine elements such as bolted, riveted and welded joints; shafts, gears, rolling and sliding contact bearings, brakes and clutches, springs.
- Unit 6 Fluid Mechanics:** Fluid properties; fluid statics, manometry, buoyancy, forces on submerged bodies, stability of floating bodies; control-volume analysis of mass, momentum and energy; fluid acceleration; differential equations of continuity and momentum; Bernoulli's equation; dimensional analysis; viscous flow of incompressible fluids, boundary layer, elementary turbulent flow, flow through pipes, head losses in pipes, bends and fittings.
- Unit 7 Heat-Transfer:** Modes of heat transfer; one dimensional heat conduction, resistance concept and electrical analogy, heat transfer through fins; unsteady heat conduction, lumped parameter system, Heisler's charts; thermal boundary layer, dimensionless parameters in free and forced convective heat transfer, heat transfer correlations for flow over flat plates and through pipes, effect of turbulence; heat exchanger performance, LMTD and NTU methods; radiative heat transfer, Stefan Boltzmann law, Wien's displacement law, black and grey surfaces, view factors, radiation network analysis.
- Unit 8 Thermodynamics:** Thermodynamic systems and processes; properties of pure substances, behaviour of ideal and real gases; zeroth and first laws of thermodynamics, calculation of work and heat in various processes; second law of thermodynamics; thermodynamic property charts and tables, availability and irreversibility; thermodynamic relations.
- Unit 9 Applications:** Power Engineering: Air and gas compressors; vapour and gas power cycles, concepts of regeneration and reheat. I.C. Engines: Air-standard Otto, Diesel and dual cycles. Refrigeration and air-conditioning: Vapour and gas refrigeration and heat pump cycles; properties of moist air, psychrometric chart, basic psychrometric processes. Turbomachinery: Impulse and reaction principles, velocity diagrams, Pelton-wheel, Francis and Kaplan turbines.
- Unit 10 Engineering Materials:** Structure and properties of engineering materials, phase diagrams, heat treatment, stress-strain diagrams for engineering materials.

- Unit 11 Casting, Forming and Joining Processes:** Different types of castings, design of patterns, moulds and cores; solidification and cooling; riser and gating design. Plastic deformation and yield criteria; fundamentals of hot and cold working processes; load estimation for bulk (forging, rolling, extrusion, drawing) and sheet (shearing, deep drawing, bending) metal forming processes; principles of powder metallurgy. Principles of welding, brazing, soldering and adhesive bonding.
- Unit 12 Machining and Machine Tool Operations:** Mechanics of machining; basic machine tools; single and multi-point cutting tools, tool geometry and materials, tool life and wear; economics of machining; principles of non-traditional machining processes; principles of work holding, design of jigs and fixtures.
- Unit 13 Metrology and Inspection:** Limits, fits and tolerances; linear and angular measurements; comparators; gauge design; interferometry; form and finish measurement; alignment and testing methods; tolerance analysis in manufacturing and assembly. Computer Integrated Manufacturing: Basic concepts of CAD/CAM and their integration tools.
- Unit 14 Production Planning and Control:** Forecasting models, aggregate production planning, scheduling, materials requirement planning.
- Unit 15 Inventory Control:** Deterministic models; safety stock, inventory control systems.
- Unit 16 Operations Research:** Linear programming, simplex method, transportation, assignment, network flow models, simple queuing models, PERT and CPM.

6.2.2 DEPARTMENT OF MECHANICAL ENGINEERING (WEST CAMPUS)

1. The Department

The Department of Mechanical Engineering, Netaji Subhas University of Technology, West Campus (formerly Ch. Brahm Prakash Government Engineering College Jaffarpur) was established in the year 2019. The First batch of B. Tech. (Mechanical Engineering) will pass out in the year 2023.

The department is grooming its undergraduate students in Mechanical Engineering in their overall development including research in various fields like Thermal, Automobile, Material Science, Production automation, data analytics etc. The faculty members engaged in Mechanical Engineering Department are well qualified and highly dedicated in overall development of the students as well as department by bestowing with quality engineering education and research. As all of these faculty members have tried to take the department to greater heights not only in academics, but also tried their best for all round development of the students in sports, cultural and literary activities.

2. Courses Offered

The Department offers 01 Undergraduate (UG) programme i.e. B. Tech. in Mechanical Engineering (Electric Vehicles) with intake of 60 students (Eight Semesters - Choice Based Credit System). The UG programme in Mechanical Engineering was started in 2019. Due to the focus of the world and Indian Government towards Electric Vehicles to reduce pollution, the UG programme in Mechanical Engineering has been changed to UG programme in Mechanical Engineering (Electric Vehicle) from the current academic session of 2020-21. The courses offered are of high standard and includes advanced topics and topics based on recent research to develop proficiency of a student in the area of design, development, production and maintenance of Electric Vehicles in addition to the core subjects of Mechanical Engineering to get them a feel of current and future tech-world.

3. Tentative Seats:

For the session 2022-23 (Even semester), the maximum number of seats in the Department of Mechanical Engineering is limited to

- (i) Seats with university fellowship: 02**
- (ii) Seats without university fellowship :Nil**

University reserves the right to change the number of seats.

***The table below indicates the maximum number of vacancies available in various areas of research. However, the total number of seats are as given above**

S. No.	Area of Research	Faculty	Maximum no. of vacancies	
			With Univ. fellowship (TRF)	Without Univ. Fellowship Self-Sponsored, UGC, CSIR, DST RF and others
1.	Self-Healing Materials, Nanotechnology and Nanomaterials, Carbon Fiber Reinforced Polymer (CFRP) Composites	Dr. Nazrul Islam Khan	01	NIL
2.	Heat Transfer Augmentation, Fluid Mechanics, Solar Thermal Systems, Optimization, Computational Fluid Dynamics, Flow Visualization, LCT and PIV.	Dr. Naveen Sharma	01	Nil

4. Faculty Profile

4.1 Dr. G. Srivastava

1.Designation & Qualification: Head, Visiting Faculty, Ph.D.

2. Areas of Interest: Thermal Engineering, Power Cycles, Combined Cycles, Cogeneration System, Turbine Blade Cooling, Refrigeration and Air Conditioning.



3. Email:gsrivastava@nsut.ac.in

4: Phone:9452907349

5.Bio-sketch: Dr. G. Srivastava has completed his B.Tech. in Mechanical Engineering from K.N.I.T.Sultanpur and M.Tech (Design) and Ph.D. from M.N.I.T Allahabad. He has worked in various Academic, Administrative and Research capacities for more than 33 years. Presently working in NSUT-West Campus as Visiting Faculty and Head of Mechanical Engineering Department.

4.2 Mr. Arvind Meena

1. **Designation, Qualification:** Assistant Professor, M. Tech., Ph.D. (Pursuing)
2. **Areas of interest:** Advanced Machining Processes.
3. **E-mail:** arvindmnmse@gmail.com
4. **Phone:** 011- 25000073
5. **Home page:** <http://nsut.ac.in/faculty/arm/>
6. **Bio-Sketch:** Mr. Arvind Meena is an Assistant Professor in the Department.



4.3 Mr. Manish Kumar

1. **Designation, Qualification:** Assistant Professor, M. Tech., Ph.D. (Pursuing)
2. **Areas of interest:** Machine Design, Aerodynamics, Technology Management, CAD, New Product Development.
3. **Phone:** 91- 9810199720
4. **E-mail:** manishk@nsitonline.in, mk_manishkumar84@yahoo.com
5. **Home page:** <http://www.nsit.ac.in/faculty/mak/>
6. **Bio-sketch:** Mr. Manish Kumar is an Assistant Professor in the Department. Currently, he is pursuing his Ph.D. from IIT Delhi.



4.4 Dr. Nazrul Islam Khan

1. **Designation, Qualifications:** Assistant Professor, Ph.D.
2. **Areas of Interest:** Self-Healing Materials, Phase Change Materials, Nanotechnology and nano-materials, Carbon Fiber Reinforced Polymer (CFRP) composites, Adhesive joining of similar and dissimilar materials.



3. List of Publications:

- a. **Nazrul Islam Khan**, Sudipta Halder, Subhankar Das, Jialai Wang. Exfoliation level of aggregated graphitic nanoplatelets by oxidation followed by silanization on controlling mechanical and nanomechanical performance of hybrid CFRP composites. Composite Part B 173 (2019) 106855.
- b. **Nazrul Islam Khan**, Sudipta Halder, Jialai Wang. “Diels-Alder based epoxy matrix and interfacial healing of bismaleimide grafted GNP infused hybrid nanocomposites”. Polymer Testing 74 (2019) 138-151.
- c. **Nazrul Islam Khan**, Sudipta Halder, Nabajyoti Talukdar, Subhankar Das, M.S. Goyat. Surface oxidized/silanized graphite nanoplatelets for reinforcing an epoxy matrix. Materials Chemistry and Physics 258 (2021) 123851.

4. **E-mail:**khan.nazrul27@gmail.com

5. **Phone:** +91-9954653121

6. **Home Page:**<http://www.nsit.ac.in/faculty/hp/>

7. Bio-Sketch: Dr. Nazrul Islam Khan is working as an Assistant Professor in the Department of Mechanical Engineering, Netaji Subhas University of Technology (formerly Netaji Subhas Institute of Technology), New Delhi. He has received his B.E. in Mechanical Engineering from Gauhati University; M.Tech and Ph.D. in Materials and Manufacturing Technology from NIT Silchar. Before joining NSUT, he has also worked as a Sr. Assistant Professor in GMR Institute of Technology, Rajam, Andhra Pradesh. Dr. Khan has published more than 20 international and national peer reviewed journal papers. He has also published 1 self-edited full book and 1 book chapter. He has filed one Indian Patent. Dr. Khan has 7 Years of teaching and research experience in the field of Nanotechnology, Nanocomposites, Multiscale laminated composites, Mechanical and self-healing behaviour of Smart materials (CFRP composites), Adhesive joining of similar and dissimilar joints, Phase materials, etc. Dr. Khan is also a life associate member of Institute of Engineers India (IEI).

4.5 Dr. Naveen Sharma

1. **Designation, Qualification:** Assistant Professor, Ph.D.

2. **Areas of Interest:** Heat Transfer Augmentation, Fluid Mechanics, Solar Thermal Systems, Optimization, Computational Fluid Dynamics, Flow Visualization, LCT and PIV.

3. **List of Publications:**

a. Naveen Sharma, A. Tariq, M. Mishra, Effect of Permeable Ribs on Thermal-Flow Characteristics in an Internal Cooling Duct, Journal of Thermal Science and Engineering Applications (ASME) (2021) 13(1):011023-1-14. (SCIE, IF: 1.544).

b. Naveen Sharma, Andallib Tariq, Manish Mishra, Enhanced Heat Transfer and Flow Features in a Duct Mounted with Various Ribs, Journal of Enhanced Heat Transfer (Begell House) (2020) 27(6):505-526. (SCIE, IF: 1.406).

c. Naveen Sharma, A. Tariq, M. Mishra, Experimental investigation of heat transfer enhancement in rectangular duct with pentagonal ribs, Heat Transfer Engineering (Taylor & Francis) (2019) 40 (1-2) 147-165. (SCIE, IF: 1.693).

d. Naveen Sharma, Andallib Tariq, Manish Mishra, Detailed heat transfer and fluid flow investigation in a rectangular duct with truncated prismatic ribs, Experimental Thermal and Fluid Science (Elsevier) (2018) 96:383-396. (SCIE, IF: 3.444).

4. **E-mail:** naveen.sharma@nsut.ac.in, sharma.naveen28@yahoo.com

5. **Phone:** +91- 7417705640

6. **Home Page:** <http://www.nsit.ac.in/faculty/ns1/>

Bio-Sketch: Dr. Naveen Sharma is an Assistant Professor in the Department of Mechanical Engineering, Netaji Subhas University of Technology (NSUT), Delhi. He received his PhD in Thermal Engineering from Indian Institute of Technology Roorkee (2018), M. Tech. in CFD & HT from NIT Hamirpur (2011) and BE in Mechanical Engineering from MDU university (2009). He is a recipient of the Director's Medal for Academic Excellence in M. Tech. at NIT Hamirpur. Before joining NSUT, Dr. Sharma worked in the Department of Mechanical Engineering, as an Associate Professor at DVR & Dr. HS MIC College of Technology, Andhra Pradesh and as Skill Assistant Professor at Shri Vishwakarma Skill University, Gurugram, India. He has over 6 years of teaching and research experience in the field of Mechanical Engineering. Dr.

Sharma has authored/co-authored over 45 international publications including, journal articles, conference proceedings, and book chapters. His research interests include Experimental Fluid Mechanics, Optical Techniques (PIV and LCT), Heat Transfer Enhancement, Optimization of Solar Thermal System, Computational Fluid Dynamics etc. Dr. Sharma is actively involved with the use of optical techniques, namely Liquid Crystal Thermography and Particle Image Velocimetry in heat transfer and fluid flow research.

4.6 Dr. Achhaibar Singh

1. **Designation, Qualification:** Visiting Faculty, Ph.D.

2. **Area of Interest:** Thermal and Fluid.

3. **List of Publications:**

a. **Singh, A**, Vyas, B.D. and Powle, U.S., 'Investigations on Inward Flow between Two Stationary Parallel Disks', Int. J of Heat and Fluid Flow, 20 (1999) 395-401.

b. **Singh, A**, 'Closed Form Solution for Outflow between Corotating Disks', ASME J. Fluids Eng., 138(2016), pp. 051203-1- 8.

c. **Singh, A**, 'Theoretical investigation on inflow between two rotating disks'. ASME J. of Fluids Eng. 139(2017), pp. 111202 -111209.

4. **E-mail:** drasingh@hotmail.com, drasingh1964@gmail.com

5. **Phone:** +91- 8826362903

6. Bio-Sketch: Dr. Achhaibar Singh is a Visiting faculty in the Department. He has six papers in reputed international journals, two papers in international conferences and ten papers in national conferences.



4.7 Dr. G. Vedabouriswaran (EAST CAMPUS)

1. Designation, Qualifications: Assistant Professor – Mechanical Engg, PhD.

2. Area of interest: Composite materials, tribology

3. Email: veda@aiactr.ac.in

4. Phone: 011 – 21210167

5. Home Page:

<http://nsuteastcampus.aiactr.ac.in/index.php/faculty/18-list-of-sah-faculty/71-g-vedabouriswaran>



6. Selected Publications

- a. **G. Vedabouriswaran** and **S. Aravindan**, “Development and characterization studies on magnesium alloy (RZ 5) surface metal matrix composites through friction stir processing” **Journal of Magnesium and Alloys**, Volume 6, Issue 2, pp 145-163, 2018. **Impact factor: 7.115.**
- b. **G. Vedabouriswaran** and **S. Aravindan**, “Wear Characteristics of Friction Stir Processed Magnesium RZ 5 Composites” **ASME., Journal of Tribology**, Volume 141, Issue 2, pp 1-10, 2019. **Impact factor: 1.829.**
- c. **G. Vedabouriswaran**, **S. Aravindan** and **P. Sathya**, “Generation of surface composites and corrosion characterization of Mg RZ 5 alloy containing rare earth elements” **Surface Review and Letters**, , DOI: 10.1142/S0218625X19502007, pp 1 -11, 2020. **Impact factor: 0.835**

7. **Bio-Sketch:** Dr. G. Vedabouriswaran, completed his B.Tech in Mechanical Engineering at Pondicherry Engineering College, Pondicherry in the year 1996. He was recruited by the Union Public Service Commission, Delhi to the post of Lecturer and joined Ambedkar Institute of Technology, Govt. of N.C.T. of Delhi in the year 2007. Presently he is working as Assistant Professor in Mechanical Engg at Ambedkar Institute of Advanced Communication Technologies and Research (erstwhile Ambedkar Institute of Technology) since 2007. Dr. G. Vedabouriswaran completed his M.Tech in Design and Ph.D from IIT Delhi. His areas of interest are composite materials, tribology. He has around 21 years of academic experience.

5 ELIGIBILITY WITH RESPECT TO BACHELORS & MASTERS DEGREE.

List of Degrees in B. Tech./B.E./B.Sc. Engg. Considered for admission

1. Mechanical Engineering
2. Manufacturing Processes and Automation Engineering
3. Production Engineering
4. Mechanical and Automation Engineering
5. Tool Engineering
6. Mechatronics

With M. Tech. specialization in any of the branches mentioned below.

1. Manufacturing and Automation
2. Manufacturing Engineering

3. Manufacturing Engineering and Automation
4. Manufacturing Engineering and Technology
5. Manufacturing Processes
6. Manufacturing Processes and Automation Engineering
7. Manufacturing Technology and Automation
8. Mechanical and Automation
9. Mechanical (Computer Aided Design, Manufacture and Engineering
10. Mechanical Engineering (CAD/CAM)
11. Mechanical Engineering- Production
12. Mechanical Engineering- Design
13. Mechanical Engineering
14. Mechatronics
15. Mechanical-Manufacturing Engineering
16. Production Engineering
17. Production and Industrial Engineering
18. Production Technology

6. SYLLABUS FOR WRITTEN TEST.

The entrance test shall consist of 100 multiple choice questions. There shall be no negative marking. 50 questions shall be based on Research Aptitude/Methodology which shall include quantitative methods/computer applications, experimental techniques etc. and 50 questions shall be subject specific. The test shall be of Two hours.

Part A Research Aptitude/Methodology:

Unit-1 Research Aptitude

- Research: Meaning, Types, and Characteristics, Positivism and Post-positivistic approach to research.
- Methods of Research: Experimental, Descriptive, Historical, Qualitative and Quantitative methods.
- Steps of Research.
- Thesis and Article writing: Format and styles of referencing.
- Application of ICT in research.
- Research ethics.

Unit-2 Comprehension & Communication

- A passage of text be given. Questions be asked from the passage to be answered.
- Communication: Meaning, types and characteristics of communication.

- Effective communication: Verbal and Non-verbal, Inter-Cultural and group communications, Classroom communication.
- Barriers to effective communication.
- Mass-Media and Society.

Unit-3 Mathematical Reasoning and Aptitude

- Types of reasoning.
- Number series, Letter series, Codes and Relationships.
- Mathematical Aptitude (Fraction, Time & Distance, Ratio, Proportion and Percentage, Profit and Loss, Interest and Discounting, Averages etc.) Unit-VI Logical Reasoning
- Understanding the structure of arguments: argument forms, structure of categorical propositions, Mood and Figure, Formal and Informal fallacies, Uses of language, Connotations and denotations of terms, Classical square of opposition.
- Evaluating and distinguishing deductive and inductive reasoning.
- Analogies.
- Venn diagram: Simple and multiple use for establishing validity of arguments.

Unit-4 Data Interpretation

- Sources, acquisition and classification of Data.
- Quantitative and Qualitative Data.
- Graphical representation (Bar-chart, Histograms, Pie-chart, Table-chart and Line-chart) and mapping of Data.
- Data Interpretation.
- Data and Governance.

Unit-5 Information and Communication Technology (ICT)

- ICT: General abbreviations and terminology.
- Basics of Internet, Intranet, E-mail, Audio and Video-conferencing.
- Digital initiatives in higher education.
- ICT and Governance.

NOTE: (i) Equal number of questions are to be set from each Unit.

(ii) Whenever graphical/pictorial question(s) are set for sighted candidates, a passage followed by equal number of questions and weightage be set for visually impaired candidates.

PART- B

Unit 1 Engineering Mechanics: Free-body diagrams and equilibrium; trusses and frames; virtual work; kinematics and dynamics of particles and of rigid bodies in plane motion; impulse and momentum (linear and angular) and energy formulations, collisions.

- Unit 2 Mechanics of Materials:** Stress and strain, elastic constants, Poisson's ratio; Mohr's circle for plane stress and plane strain; thin cylinders; shear force and bending moment diagrams; bending and shear stresses; deflection of beams; torsion of circular shafts; Euler's theory of columns; energy methods; thermal stresses; strain gauges and rosettes; testing of materials with universal testing machine; testing of hardness and impact strength.
- Unit 3 Theory of Machines:** Displacement, velocity and acceleration analysis of plane mechanisms; dynamic analysis of linkages; cams; gears and gear trains; flywheels and governors; balancing of reciprocating and rotating masses; gyroscope.
- Unit 4 Vibrations:** Free and forced vibration of single degree of freedom systems, effect of damping; vibration isolation; resonance; critical speeds of shafts.
- Unit 5 Machine Design:** Design for static and dynamic loading; failure theories; fatigue strength and the S-N diagram; principles of the design of machine elements such as bolted, riveted and welded joints; shafts, gears, rolling and sliding contact bearings, brakes and clutches, springs.
- Unit 6 Fluid Mechanics:** Fluid properties; fluid statics, manometry, buoyancy, forces on submerged bodies, stability of floating bodies; control-volume analysis of mass, momentum and energy; fluid acceleration; differential equations of continuity and momentum; Bernoulli's equation; dimensional analysis; viscous flow of incompressible fluids, boundary layer, elementary turbulent flow, flow through pipes, head losses in pipes, bends and fittings.
- Unit 7 Heat-Transfer:** Modes of heat transfer; one dimensional heat conduction, resistance concept and electrical analogy, heat transfer through fins; unsteady heat conduction, lumped parameter system, Heisler's charts; thermal boundary layer, dimensionless parameters in free and forced convective heat transfer, heat transfer correlations for flow over flat plates and through pipes, effect of turbulence; heat exchanger performance, LMTD and NTU methods; radiative heat transfer, Stefan Boltzmann law, Wien's displacement law, black and grey surfaces, view factors, radiation network analysis.

- Unit 8 Thermodynamics:** Thermodynamic systems and processes; properties of pure substances, behaviour of ideal and real gases; zeroth and first laws of thermodynamics, calculation of work and heat in various processes; second law of thermodynamics; thermodynamic property charts and tables, availability and irreversibility; thermodynamic relations.
- Unit 9 Applications:** Power Engineering: Air and gas compressors; vapour and gas power cycles, concepts of regeneration and reheat. I.C. Engines: Air-standard Otto, Diesel and dual cycles. Refrigeration and air-conditioning: Vapour and gas refrigeration and heat pump cycles; properties of moist air, psychrometric chart, basic psychrometric processes. Turbomachinery: Impulse and reaction principles, velocity diagrams, Pelton-wheel, Francis and Kaplan turbines.
- Unit 10 Engineering Materials:** Structure and properties of engineering materials, phase diagrams, heat treatment, stress-strain diagrams for engineering materials.
- Unit 11 Casting, Forming and Joining Processes:** Different types of castings, design of patterns, moulds and cores; solidification and cooling; riser and gating design. Plastic deformation and yield criteria; fundamentals of hot and cold working processes; load estimation for bulk (forging, rolling, extrusion, drawing) and sheet (shearing, deep drawing, bending) metal forming processes; principles of powder metallurgy. Principles of welding, brazing, soldering and adhesive bonding.
- Unit 12 Machining and Machine Tool Operations:** Mechanics of machining; basic machine tools; single and multi-point cutting tools, tool geometry and materials, tool life and wear; economics of machining; principles of non-traditional machining processes; principles of work holding, design of jigs and fixtures.
- Unit 13 Metrology and Inspection:** Limits, fits and tolerances; linear and angular measurements; comparators; gauge design; interferometry; form and finish measurement; alignment and testing methods; tolerance analysis in manufacturing and assembly. Computer Integrated Manufacturing: Basic concepts of CAD/CAM and their integration tools.

Unit 14 Production Planning and Control: Forecasting models, aggregate production planning, scheduling, materials requirement planning.

Unit 15 Inventory Control: Deterministic models; safety stock, inventory control systems.

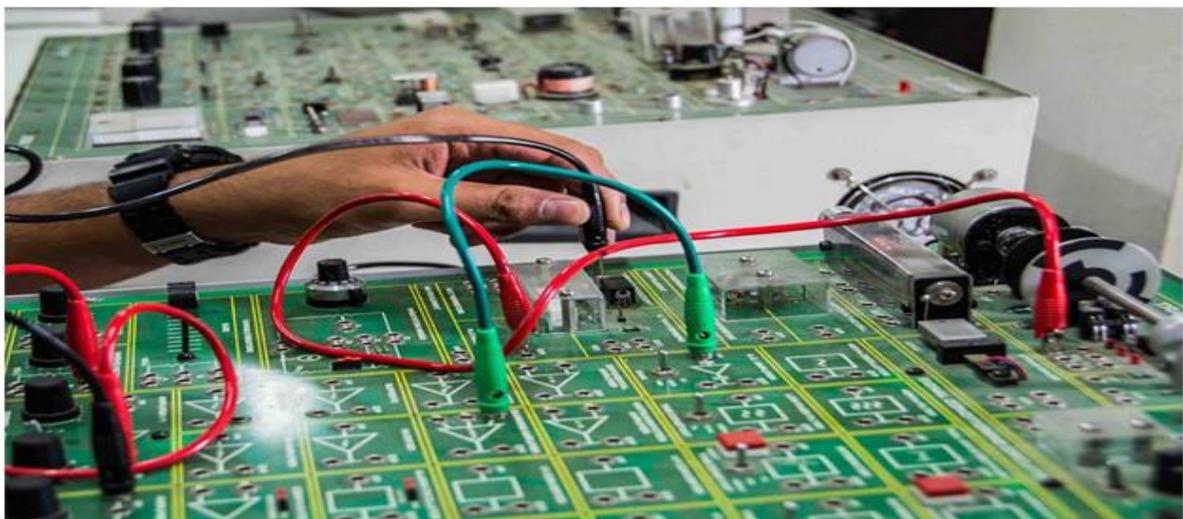
Unit 16 Operations Research: Linear programming, simplex method, transportation, assignment, network flow models, simple queuing models, PERT and CPM.

6.2.3 DEPARTMENT OF INSTRUMENTATION & CONTROL ENGINEERING (MAIN CAMPUS)

1.The Department

The Department of Instrumentation & Control Engineering (*ICE*) was established in the year 1983. All through its sparkling history of 38 years, the department of ICE has been known for its exceptionally strong Under-Graduate, Post-Graduate and Research programmes. Instrumentation and Control is a very broad area in the sense that it has an interdisciplinary character. There is a proliferation of a variety of the Instrumentation systems for a variety of purpose.

The department has always been on a progressive path, thanks to the experienced and dedicated faculty members who have a strong commitment towards providing quality engineering education and research. The Department has **20 faculty members, 10 Professors, 01 Associate Professors, 06 Assistant Professors, 03 Adjunct Professor** and most of the faculty members are Doctoral degree holders.



Vision:

To be a department of premier University of global recognition that provides Excellence in Education, Research and Development in the field of Instrumentation & Control Engineering, to create potential Innovators and leaders to serve Society and Nation.

Mission:

- **M1.** To promote academic growth by offering state-of-the-art Undergraduate, Postgraduate and Doctoral programmes and to impart emerging and new knowledge in Research & Development.
- **M2.** To identify the thrust area of specialization in education based on perception of Regional and National as well as global needs.
- **M3.** To undertake collaborative projects which offer opportunities for long term interaction with leading Academia and industries to cater to the needs of the Society and Nation.
- **M4.** To foster human potential by inculcating responsible behavior, Environment, improvement, Ethics, Innovation and Entrepreneurship.

2. Courses Offered

The Department of Instrument & Control Engineering is currently offering Undergraduate (UG), Postgraduate (PG) and Ph.D. program. The rapid developments in the field of Instrumentation & Control Engineering triggered the inception of PG programme on 'Industrial Electronics' in the year 2016. In addition, the Department also offers high quality research programmes at the doctoral level.

To keep in pace with the current technological advancements, the UG curriculum has recently been modified, so that the students can get a feel of what exactly is happening outside in the tech-world.

- B.Tech.-Instrumentation & Control Engineering (150 students - Eight Semesters- Semesters - Choice Based Credit System)
- M.Tech. -Industrial Electronics (18 students - Four Semesters - Choice Based Credit System)
- Doctor of Philosophy (Ph.D.)

3. Areas of Research and Available Vacancies

Our research capabilities provide solutions for clients and partners in a wide range of sectors including those listed below.

Robust Control, Optimal control, Intelligent Control, Intelligent Control of Systems and Processes, DSP, Instrumentation, PV Systems, FPGA

Applications, Renewable Energy systems, Electric drives, Analog & mixed mode signal processing, Process Control, Robotic systems, Biomedical Instrumentation, Image Processing, Robust Control System, Power Electronics, Biometrics, Adaptive Control.

The details of above wide area of research are as follows:

- **Control System/Process Control/Robotics**

Research activities are carried out in all aspects of Control Engineering including Identification and Adaptive Systems, Robust Filtering and Control, Distributed Systems, Optimal and Stochastic Control, Robot Dynamics and Control, Practical applications of Control Systems theory, Modelling Simulation and Control of Nonlinear Systems. Robust and Optimal Control techniques. Robotic manipulator, Unmanned Aerial Vehicles, Application based projects in Process Control. Reduced order Modelling and large scale systems

- **Renewable Energy/ Power Electronics/Hybrid Energy System/Electrical Drives**

Research activities in the areas of Power Systems Analysis and Control, Power Generation, HVDC, FACTS, Distribution Automation, Energy Systems, Energy Audit and Energy Conservation, Renewable Energy (Wind, Small Hydro, and PV), Electrical Machines and Drives, Power Electronics, Special Electric Machines, Adjustable Speed Drives and Intelligent Motor Control, Power Management Circuits, Utility interfaces for renewable generation, Micro Grid and Smart Grid, Machine design and control, Converter topologies, Power quality issues, Electrical drives etc.

- **Transducer & Measurement/Bio-medical Instrumentation, Biometric/ Image and Signal Processing**

Research areas include application and design of Transducers and Measurement. Biomedical related fields. Health Monitoring and Intelligent Fault Diagnosis Systems, Soft-Computing in Modelling and Control, Computer Vision, Bioinformatics, Unmanned Aerial Vehicles, Image Frame Generation, Brain Computer Machine Learning, Speech Signal Processing and Recognition (with emphasis on Indian Languages), Speaker and Language Identification, Multi modal signal processing, Recognition, Verification and Identification of Single and Multimodal Biometrics using AI / Machine Learning techniques. Gait Recognition and Verification, Palm

Print, Dorsal vein, Signature and Iris recognition, Speaker Identification and Speech processing and combination of two or more Biometrics.

▪ **Artificial Intelligence/ Intelligent Control/ Adaptive Control/ Softcomputing based Adaptive Control**

Intelligent Control, Quantum Learning System, Cognitive Modeling, Soft Computing, Nonlinear Systems, Multi-agent systems and their coordinated control, Machine Learning Algorithms, Intelligent Agents and their Applications. Artificial Intelligence, Pattern Recognition, Graph Theory, Neural Networks, Fuzzy Logic based Control and Applications. Neural Networks and Fuzzy Logic, Applied Systems Analysis, Modeling of Computer Communication Networks and Image Processing. Design and Development of Artificial intelligent based Systems. Intelligent Control based applications.

3.1 Tentative Seats:

For the Session 2022-2023 (Even Sem) the maximum number of seats in the department of ICE are limited to

(i) Total Vacancies in the Department : 49

University reserves the right to change the number of seats.

The table below indicates the maximum number of vacancies available in various areas of research. However, the total numbers of seats are as given above

S. No	Area of Research	Faculty	Ph.D. Thesis Completed	Total no. of Vacancies
1.	Control System/Process Control/Robotics	Prof. Rajneesh Sharma	03	03
		Prof. S.K. Jha	01	03
		Prof. Vineet Kumar	06	03

		Dr. Pragya Varshney	03	04
2.	Renewable Energy/ Power Electronics/Hybrid Energy System/ Power Systems/ Power Quality/Electrical Drives	Prof. Asha Rani	06	02
		Prof. S.K. Jha	01	02
		Dr. Bhavnesh Kumar	03	01
		Dr. Anuradha Tomar	-	01
		Dr. Alok Agrawal	-	02
3.	Transducer & Measurement/Bio-medical Instrumentation, Bio-metric/Image, and Signal Processing	Prof. Smriti Srivastava	11	02
		Prof. KPS Rana	04	02
		Prof. Vijander Singh	10	03
		Prof. Vineet Kumar	06	03
		Dr. Pragya Varshney	03	03
		Dr. Jyoti Yadav	-	01
4.	Artificial Intelligence/Intelligent Control/ Adaptive Control/Soft	Prof. Asha Rani	06	02
		Prof. Smriti Srivastava	11	02

computing based Adaptive Control	Prof. KPS Rana	04	02
	Prof. Vijander Singh	10	03
	Prof. Rajneesh Sharma	03	03
	Dr. Jyoti Yadav	-	01
	Dr. Bhavnes Kumar	03	01

The Vacancies and Supervision under a faculty is counted only once and in any one of the research fields available.

4. Faculty Profile

4.1 Prof. Asha Rani

1. Designation, Qualifications: Professor & Head of the Department, Ph.D.
2. Areas of Interest: Renewable Energy, Intelligent Control, Adaptive Control, Soft Computing based Adaptive Control, Biomedical Signal Processing, Robotic manipulator
3. E-mail: asha.rani@nsut.ac.in
4. Phone: 9953681254
5. Home Page: <http://www.nsut.ac.in>
6. Selected publication:
 - a. S Goyal, V Singh, A Rani, N Yadav, Multimodal image fusion and denoising in NSCT domain using CNN and FOTGV, Biomedical Signal Processing and Control 71, 103214, 2022 (IF 3.88)
 - b. B Panjwani, V Singh, A Rani, V Mohan, Optimum multi-drug regime for compartment model of tumour: cell-cycle-specific dynamics in the presence



- of resistance, *Journal of Pharmacokinetics and Pharmacodynamics*, 1-20, 2021(IF 2.745).
- c. A Prabha, J Yadav, A Rani, V Singh, Design of intelligent diabetes mellitus detection system using hybrid feature selection based XGBoostclassifier, *Computers in Biology and Medicine* 136, 104664, 2021 (IF 4.589)
 - d. A novel nature-inspired algorithm for optimization: Squirrel search algorithm, M Jain, V Singh, A Rani, *Swarm and Evolutionary Computation* 44, 148-175, 2019 (IF 7.177).
7. Bio-Sketch: Asha Rani received her B.Tech. in Electrical Engineering from Regional Engineering College (Now NIT), Hamirpur, Himachal Pradesh in 1998. She received M.E. degree in Electrical Engineering from IIT Roorkee in 2000 and Ph.D in 2013 from University of Delhi, Delhi. She joined as lecturer in Instrumentation and Control Engineering Division at Netaji Subhas University of Technology, New Delhi in 2001 and currently she is a Professor in the organisation. She has published many papers in international journals and conferences. More than 28 M.Tech. and 6 Ph.D. thesis are completed under her guidance. Currently 3 Ph.D. students are working under her supervision. Her areas of research are Renewable Energy, Intelligent Control, Adaptive Control, Softcomputing based Adaptive Control, Biomedical Signal Processing and Robotic manipulator. She is the senior member of IEEE and IETE. She has chaired many conference sessions and has delivered expert lectures in short term courses at different colleges.

4.2 Prof. A.P. Mittal

1. Designation, Qualifications: Professor, Ph.D.
2. Areas of Interest: Power Electronics, Electric Drives, FACTS and Intelligent Instrumentation
3. E-mail: mittalap@gmail.com
4. Phone:9899249107
5. Home Page: <http://www.nsut.ac.in>
6. Latest Publication:



- a. A.P. Mittal, Vinita Jain and Tanuj Ahuja, "Google File System and Hadoop Distributed File System- An Analogy," *International Conf. on Emerging Trends of Engineering, Science, Management and Its Applications (ICETESMA-15)*, 01st March, 2015, JNU, New Delhi.

- b. A.P. Mittal, Vinita Jain and Tanuj Ahuja, “Understanding Hadoop Architecture and Establishing Single Node Hadoop Virtualization Environment,” Bilingual International Conference on Information Technology: Yesterday, Today and Tomorrow, Feb 19-21, 2015, Delhi.
 - c. Perna Gaur and A. P. Mittal, “Qualitative and Qualitative Analysis of Fibonacci & Linear Array of Solar Panels,” 29th Indian Engineering Congress, Dec. 18-21, 2014, Hyderabad.
7. Bio-Sketch: Prof. Alok Prakash Mittal obtained B.E. (Hons.) Electrical Engineering in 1978 from M.M.M. Engg. College, Gorakhpur, U.P., M. E. in Power Apparatus & Electric Drives from University of Roorkee (Now IIT Roorkee) in 1980 and Ph. D. in Power Electronics from IIT Delhi in 1991. Prof. Mittal worked in REC, Kurukshetra (Presently NIT) from April, 1985 to June 1987 and from Sept. 1989 to July 1997. He also worked in REC, Hamirpur (H.P) from July 1987 to Sept. 1989. From July 1997 to June, 2001, he worked in Chotu Ram State College of Engg. (Presently DCRUST) Murthal as Professor & Head of Electrical and Electronics Engineering Department. He worked as Dean, IRD from Nov. 2004 to March 2011, as Dean, Student Welfare from Aug. 2004 to July 2008, as member of NBA expert committee for accreditation of about eighty institutes from Nov. 2003 onward. He was Chairman, ISTE, Murthal Chapter during 1999-2001, Chairman, ISTE, NSUT, Delhi Chapter during 2002-2005, and Secretary ISTE Delhi Section during 2003-2006. He also hold the post of Member Secretary, AICTE from April, 2016 to August, 2019.

4.3 Prof. Smriti Srivastava

- 1. Designation, Qualifications: Professor, Ph.D.
- 2. Areas of Interest: Neural Networks, Fuzzy logic, Intelligent Modelling and Control of Dynamical systems, Artificial Intelligence, Biometrics, Deep Learning and Machine Learning
- 3. E-mail: smriti.nsit@gmail.com
- 4. Phone: + 919810730260
- 5. Home Page: <http://www.nsut.ac.in>
- 6. Latest Publications:
 - a. Kumar, R., Srivastava, S., Gupta, J. R. P., & Mohindru, A. (2018), “Self-recurrent wavelet neural network-based identification and adaptive



predictive control of nonlinear dynamical systems,” International Journal of Adaptive Control and Signal Processing, Wiley, 32(9), 1326-1358.

- b. Kumar, R., Srivastava, S., Gupta, J. R. P., & Mohindru, A. “Temporally local recurrent radial basis function network for modeling and adaptive control of nonlinear systems,” ISA transactions, Elsevier, (Accepted 2019).
 - c. Arora, P., Srivastava, S., Hanmandlu, M., & Bhargava, S. (2018), “Robust Authentication using Dorsal Hand Vein Images,” IEEE Journal of Intelligent Systems 1-12. doi:10.1109/mis.2018.2881494
7. Bio-Sketch: Prof. Smriti Srivastava received the B.E. degree in electrical engineering and the M.Tech. degree in heavy electrical equipment from Maulana Azad College of Technology [now Maulana Azad National Institute of Technology (MANIT)], Bhopal, India, in 1987 and 1991, respectively, and the Ph.D. degree in intelligent control from the Indian Institute of Technology, New Delhi, India, in 2005. From 1988 to 1991, she was a faculty member with MANIT, and since August 1991, she has been with the Department of Instrumentation and Control Engineering, Netaji Subhas Institute of Technology, University of Delhi, New Delhi, India, where she is presently working as Professor in the Instrumentation and Control Engineering Division at NSUT, New Delhi from September 2008 to till date and Dean Under Graduate Studies. She also worked as Associate Head of Instrumentation & Control Engineering Division at NSUT from April 2004 to Nov. 2007 and from September 2008 to December 2011. She is the reviewer of Reviewer of IEEE Transactions on Systems, Man and Cybernetics (SMC), Part-B. IEEE Transactions on Fuzzy Systems, International Journal of Applied Soft Computing (Elsevier), International Journal of Energy, Technology and Policy (Inder Science).

4.4 Prof. K.P.S Rana

1. Designation, Qualifications: Professor and Dean, Ph.D.
2. Areas of Interest: Measurement and Control, Sensor Linearization, Digital Signal Processing, FPGA applications, Robotics Renewable Systems, Virtual/Intelligent Instrumentations, Optimization Techniques.
3. E-mail: kpsrana@nsut.ac.in
4. Phone: 91-11-2500 0225 (Direct), 9968077265 (M)



5. Home Page: <https://sites.google.com/site/kpsrana1/home>.

6. Latest Publication:

- a. Vineet Kumar, K. P. S. Rana, Jitendra Kumar, Puneet Mishra, "Self-tuned Robust Fractional Order Fuzzy PD controller for Uncertain and Nonlinear Active Suspension System," *Neural Computing and Applications*, vol. 30, no. 6, pp. 1827-1843, Springer Publication, September 2018. DOI: 10.1007/s00521-016-2774-x (SCI Indexed, Impact factor – 4.213).
- b. Dhruv Kler, K.P.S. Rana, Vineet Kumar, "A Nonlinear PID Controller Based Novel Maximum Power Point Tracker for PV Systems," accepted for publication in *Journal of the Franklin Institute*, Elsevier, 2018. (SCI Indexed, Impact factor - 3.139).
- c. Prabhav Singh, Ridam Srivastava, K.P.S. Rana, Vineet Kumar, "A Multimodal Hierarchical Approach to Speech Emotion Recognition from Audio and Text," *Knowledge Based System*, Elsevier, 2021, vol. 93, pp. 312-324, Impact factor: 8.038, Science Citation Indexed.

7. Bio-sketch: K.P.S. Rana received M.Sc. degree in Physics (Electronics Major) from Meerut University, India, M.Tech. degree in Instrumentation from Indian Institute of Technology Delhi, India and Ph.D. degree on Intelligent Methods for Complex Vibration Measurement and Control from Guru Gobind Singh Indraprastha University, New Delhi, India. He served the Indian Space Research Organization (ISRO) from 1993-2000 as Scientist at various levels. Since August 2000 he has been associated with the Netaji Subhas University of Technology (Formerly, NSIT), India in Instrumentation and Control Engineering Department where he has served as an Assistant Professor and Associate Professor from 2000-2005 and 2006-2011, respectively. Since 2011 he has been Professor at NSUT. He has always been active in institutional development and administrative responsibilities and presently holds the positions of Dean, Faculty of Electrical and Mechanical Engineering and Dean, Faculty of Information and Communication Technology.

His current teaching and research interests include intelligent instrumentation and control, virtual instrumentation, FPGA applications in measurement and control, digital signal processing, optimization techniques, modeling and MPPT control of solar PV systems and Fuel cells. He is listed in Marquis Who's Who in 2011. He is a life member of Indian

Society for Technical Education (ISTE) and fellow of Institution of Engineers, India (IEI).

4.5 Dr. Vijander Singh

1. Designation, Qualifications: Professor, Dean Faculty of Management Studies, Dean faculty of Design & Dean Student Welfare, Ph.D.

2. Areas of Interest: Transducer & Measurement, Bio-medical Instrumentation, Bio-metric, Image and Signal Processing, Artificial Intelligence, Intelligent Control, Adaptive Control, Soft computing based Adaptive Control.



3. E-mail: vijaydee@nsut.ac.in

4. Phone: 9205475006

5. Home Page: <http://www.nsut.ac.in>

6. Selected publication:

a. S Goyal, V Singh, A Rani, N Yadav, Multimodal image fusion and denoising in NSCT domain using CNN and FOTGV, Biomedical Signal Processing and Control, 71, 103214, 2022 (IF 3.88)

b. B Panjwani, V Singh, A Rani, V Mohan, Optimum multi-drug regime for compartment model of tumour: cell-cycle-specific dynamics in the presence of resistance, Journal of Pharmacokinetics and Pharmacodynamics, 1-20, 2021 (IF 2.745).

c. A Prabha, J Yadav, A Rani, V Singh, Design of intelligent diabetes mellitus detection system using hybrid feature selection based XGBoost classifier, Computers in Biology and Medicine 136, 104664, 2021 (IF 4.589)

d. A novel nature-inspired algorithm for optimization: Squirrel search algorithm, M Jain, V Singh, A Rani, Swarm and Evolutionary Computation 44, 148-175, 2019 (IF 7.177).

7. Bio-Sketch: Vijander Singh received his B.Tech. in Electrical Engineering from G.B.Pant University of Agriculture and Technology Pant Nagar in Uttarakhand in 1995. He received M.E. degree in Electrical Engineering in 2000 and Ph.D in Electrical Engineering in 2007 from IIT Roorkee. He has published many papers in international journals and conferences. He has chaired many international conferences. More than 35 M.Tech. and 10 Ph.D theses have been completed under his guidance. Currently 4 Ph.D.

students are working under his supervision. He is working as Professor in Instrumentation and Control Engineering Department at Netaji Subhas University of Technology, New Delhi. His areas of research are Transducer & Measurement, Bio-medical Instrumentation, Image and Signal Processing, Artificial Intelligence, Intelligent Control, Adaptive Control, Soft computing based Adaptive Control. He is senior member of IEEE and IETE.

4.6 Dr. Rajneesh Sharma

1. Designation, Qualifications: Professor, Ph.D.
2. Areas of Interest: Neural Networks, Fuzzy Systems, Intelligent Controllers, Robotics, Game based adaptive control, Control Systems and Multi agent Systems
3. E-mail: raj_mgopal@rediffmail.com
4. Phone: +91-11-25000242(O)
5. Home Page: <https://sites.google.com/site/rajneesh496/Profile>



6. Latest Publications:

- a. Nandan Km. Navin, Rajneesh Sharma, Hasmat Malik, “Solving nonconvex economic thermal power dispatch problem with multiple fuel system and valve point loading effect using Fuzzy Reinforcement Learning”, in Press, Journal of Intelligent and Fuzzy Systems, January 2018 (SCI, IF 1.261)
- b. Amit Kukker and Rajneesh Sharma, “Neural Reinforcement Learning Classifier for Elbow, Finger and Hand Movements”, in Press, Journal of Intelligent and Fuzzy Systems, January 2018 (SCI, IF 1.261)
- c. Abhishek Kumar and Rajneesh Sharma, “Neural/Fuzzy Self Learning Lyapunov Control for Non Linear Systems”, In Press, International Journal of Information Technology, Springer Singapore, December 2017.

7. Bio-Sketch: Dr. Rajneesh Sharma did his B.E. in Electrical Engineering from Delhi College of Engineering, Delhi University and M.E. in Control and Instrumentation from Delhi College of Engineering, Delhi University. He did his Ph.D. in Intelligent Control of Non Linear Systems from Indian Institute of Technology, Delhi. Thereafter Dr. Sharma carried out Post-Doctoral Research at Institute for Systems and Robotics, IST, Lisbon, Portugal for one year. Dr. Sharma has worked in BHEL, Department of Telecommunications as IES and Indian Railways as IES officer prior to

joining NSUT in 2001. He has published about 20 research papers in reputed refereed journals and conferences.

4.7 Prof. S.K.JHA

1. Designation, Qualifications: Professor, Ph.D.
2. Areas of Interest: Control Engineering, Electrical Machine
3. E-mail: jhask2@yahoo.co.in
4. Phone: 9868218924
5. Home Page: <http://www.nsut.ac.in>



6. Latest Publications:

- a. S. K. Jha, A. K. Yadav, Prerna Gaur, H. Parthsarathy, and J.R.P. Gupta, "Robust and Optimal Control Analysis of Sun Seeker System," Journal of Control Engineering and Applied Informatics, Vol.16, No.1, pp. 70-79, March 2014 (SCI Indexed).
- b. K. Yadav, P. Gaur, S. K. Jha, J. R. P. Gupta, and A. P. Mittal, "Optimal Speed Control of Hybrid Electric vehicle," Journal of Power Electronics, vol. 11, no. 4, pp.393-400, July 2011) (SCI Indexed).
- c. Anuj Rawat, S.K. Jha, Bhavnes Kumar, Mohan, Vijay, "Nonlinear fractional order PID controller for tracking maximum power in photo-voltaic system", Journal of Intelligent & Fuzzy Systems, vol. 38, no. 5, pp. 6703-6713, 2020. (SCIE Indexed, IF-1.637).

7. Bio-Sketch: Dr. S. K. Jha did his B. Tech. in Electrical Engineering from Bhagalpur College of Engineering in the year 1994 and subsequently M.Tech. And Ph. D. from University of Delhi. Currently he is Professor in the Instrumentation & Control engineering Department at N.S.U.T, New Delhi. His research interests include optimal control, robust control, bio-inspired control and electric drives etc. He is a Life Member of the Indian Society for Technical Education (ISTE). He is life member of Institution of Engineers, India and Swadeshi Science Movement of India. He is Fellow IETE. He has contributed as the Expert in Expert Advisory Committee Meetings for preparation of Definitional Dictionary of Electrical Engineering organized by Commission for Scientific & Technical Terminology, Ministry of HRD, Department of Higher Education, and Government of India. As expert member, he is in the panel list of UPSC and other prominent Service Selection Boards of India. In the face of burgeoning case of inhuman

activity world over, his current interest extends to discovering the intertwined link between science and spirituality.

4.8 Prof. A.N JHA

1. Designation, Qualifications: Professor, Ph.D.
2. Areas of Interest: Control system, process control and Mechatronics.
3. E-mail: anj.nanotech@gmail.com
4. Phone: 011-25000237
5. Home Page: <http://www.nsut.ac.in>
6. Latest Publications:



- a. Y.V. Hote , A. N. Jha and J.R.P. Gupta, “Reduced order Modeling for some class of Interval Systems,” International Journal of Modeling and simulation, Taylor and Franics, Vol.34, No.2, pp. 63-69, 2014
 - b. Y.V. Hote , A. N. Jha, “New approach of Gerschgorin Theorem in model order reduction” International Journal of Modeling and simulation, Taylor and Franics, Vol.35, Issue 3-4, 2015
 - c. Satyam Anand,RishuKumar,Amar Nath Jha, "Tuning of PID Controller using BBBC algorithm for higher order oscillatory systems",2020 IEEE 2nd International conference on Electronics, Control, Optimization and Computer Science (ICECOCS), 2-3 December-2020,Kenitra, Morocco.
7. Bio-Sketch: A.N. Jha received the B.Sc. degree in electrical engineering and M.E. degree in control and instrumentation (Electrical Engineering Department), from Bhagalpur University and University of Delhi, India, in 1988,2001 respectively. He is life member of ISTE, New Delhi. His field of research includes reduced order modeling and process control.

4.9 Prof. Vineet Kumar

1. Designation, Qualifications: Professor, Ph.D.
2. Areas of Interest: Process Dynamics & Control, Intelligent process control, soft computing-based control techniques and their applications, Digital Signal Processing and Robotics.



3. E-mail: vineetkumar27@gmail.com; vineet.kumar@nsut.ac.in

4. Phone: 9312710779

5. Home Page: <https://sites.google.com/site/drvineetkumar27/>

6. Latest Publication:

a. VineetKumar,K.P.S. Rana, Dhruv Kler, “Efficient Control of a 3-Link planar rigid manipulator using Self-Regulated Fractional-Order Fuzzy PID controller,” Applied Soft Computing, Elsevier, vol. 82, Article 105531, September 2019. (SCI Index, Impact factor – 3.907) DOI: <https://doi.org/10.1016/j.asoc.2019.105531>.

b. Vineet Kumar, K. P. S. Rana, Jitendra Kumar, Puneet Mishra, "Self tuned Robust Fractional Order Fuzzy PD controller for Uncertain and Nonlinear Active Suspension system”, Neural Computing and Applications, vol. 30, no. 6, pp. 1827-1843, Springer Publication, September 2018. (SCI Index, Impact factor – 4.213) DOI: 10.1007/s00521-016-2774-x

c. Dhruv Kler, Vineet Kumar, K.P.S. Rana, “Optimal IPD Controller Design by Evolutionary Algorithm for Thermal-Renewable Energy-Hybrid Power Systems,” IET Renewable Power Generation (RPG), vol. 13, no. 11, pp. 2000-2012 August 2019. (SCI Index, Impact factor – 3.488) DOI:10.1049/iet-rpg.2018.5745

7. Bio-Sketch: Vineet Kumar received M.Sc. degree in Physics with electronics from Govind Ballabh Pant University of Agriculture & Technology, Pantnagar, M. Tech. degree in Instrumentation from Regional Engineering College, Kurukshetra, and Ph.D. degree from Delhi University. He has served the industry from 1996 to 2000. Since July 2000, he has been associated with the Netaji Subhas Institute of Technology (NSIT), Delhi University, Delhi, India. Currently, he holds the post of Professor in the Instrumentation and Control Engineering Division, Netaji Subhas University of Technology (NSUT). He has published more than 125 peer-reviewed research papers in reputed international journals, international conferences and edited books in international publications (Elsevier and Springer) as book chapters. He is a Life Member of the Indian Society for Technical Education (ISTE). His research interests include Process Dynamics & Control, Intelligent process control, soft computing-based control techniques and their applications, Digital Signal Processing and Robotics.

4.10 Prof. Pragya Varshney

1. Designation, Qualifications: Associate Professor, Ph.D.
2. Areas of Interest: Analog and Mixed Mode Signal Processing,
VLSI Design, Intelligent Control.
3. E-mail: pragya.varshney@nsut.ac.in
4. Phone: +91-11-25000196(O)
5. Home Page: <http://www.nsut.ac.in>



6. Latest Publications:

- a) S. Gupta, P. Varshney and S. Srivastava, “Whale Optimization Based Synchronization and Control of Two Identical Fractional Order Financial Chaotic Systems,” accepted for publication in JIFS Special Issue of IOS Press, Sept. 2020
- b) S. Gupta, V. Upadhyaya, A. Singh, P. Varshney and S. Srivastava, “Modeling of Fractional Order Chaotic Systems using Artificial Bee Colony Optimization and Ant Colony Optimization,” Journal of Intelligent and Fuzzy Systems, 2018, vol. 35(5), pp. 5337-5344, DOI: 10.3233/JIFS-169816.
- c) D. Goyal, and P. Varshney, “Analog Realization of Electronically Tunable Fractional Order Differ-Integrators,” Arabian Journal for Science and Engineering, <https://doi.org/10.1007/s13369-018-3209-z>, April 2018.

7. Bio-Sketch: Dr. Pragya Varshney is Associate Professor in the Division of Instrumentation and Control Engineering, NSUT. She holds Bachelor of Engineering in Electrical Engineering from University of Roorkee, Roorkee, Uttarakhand (Now, IIT Roorkee) and Master of Engineering in Control and Instrumentation from Delhi College of Engineering, Delhi. She is Ph. D. from University of Delhi. She has published her work in various International Journals including IEEE Transactions on Circuits and Systems – II: Express Briefs. She has also presented her research work in several International IEEE Conferences in India and abroad. She is a member of IEEE since 2004 and life member of ISTE. She is regularly reviewing articles for some International Conferences and has reviewed few journal publications.

4.11 Mr. R.C. Thakur

1. Designation, Qualifications: Associate Professor, M.Tech
2. Areas of Interest: Computer Networks, Communications, Adv. Microprocessors and Embedded Systems, Digital Hardware Design.
3. E-mail: rct@nsit.ac.in
4. Phone: +91-11-25099029
5. Home Page: <http://www.nsut.ac.in>



6. Bio-Sketch: R.C. Thakur is Associate Professor in Instrumentation & Control Engineering Division. His area of interest is Computer Networking, Communication Systems, and Microprocessor based System Design. He is B.Sc. (Engg.) in Electronics & Telecommunication Engineering from BIT Sindri, Dhanbad and M.Tech in Computer Technology from IIT Delhi. He started his career in 1988 from Bokaro Steel Plant with a very short instant of merely 2 months and then switched over to IIT Delhi where he served as Senior Scientific Officer - II (as a faculty in Microprocessor Application Program). He was under deputation to Heriot Watt University, Edinburgh for 6 months under TCTP Program of British Council. He joined DIT in year 1995 as a Senior Software Engineer, re-designated as Senior System Analyst and then Assistant Professor that has been re-designated as Associate Professor. Apart from his primary job of teaching in the Division of Instrumentation & Control Engg., he was instrumental in setting up Campus Wide Computer Networking Center at the time of shifting of the Institute to its new Campus in Dwarka in 1998. Since then he handles this center (Institute Networking Scheme) as its Coordinator except 2 years tenure during 2002-2004. He is member of ITU-T National Working Group-9 besides life member of ISTE.

4.12 Mr. Vicky Suri

1. Designation, Qualifications: Assistant Professor, B.E(ICE), DIT,MIETE
2. Areas of Interest: Artificial Intelligence, Biomedical Engineering
3. E-mail: vickysuri@gmail.com
4. Phone: 9899664188



5. Home Page: <http://www.nsut.ac.in>.
6. Bio-Sketch: I was working in multinational company in area of Electronic Design Automation for one year. Then I joined DIT, as Technical Officer for two years. Then I joined NSUT as faculty member. Presently I am working as Assistant Professor in Division of Instrumentation and Control Engineering. I was a Ph.D. Scholar in Center of Biomedical Engineering, IIT. Delhi from 2003 to 2010. My present area of interest is Signal and Systems, Biomedical Engineering and Artificial Intelligence.

4.13 Dr. Jyoti Yadav

1. Designation, Qualifications: Assistant Professor, Ph.D.
2. Areas of Interest: Non-invasive glucose monitoring and control, Biomedical Instrumentation, Biomedical Transducers and Sensors, Controlled Drug Delivery System.
3. E-mail: bmjyoti@gmail.com, jyoti.yadav@nsut.ac.in
4. Phone: 8130088308
5. Home Page: <http://www.nsut.ac.in>



6. Latest Publications:

- a. Prabha, A., **Yadav, J.**, Rani, A. and Singh, V., 2021. Design of intelligent diabetes mellitus detection system using hybrid feature selection based XGBoost classifier. *Computers in Biology and Medicine*, 136, p.104664 [SCI IF 4.589]
- b. Pachauri N., **Yadav J.**, Rani A. and Singh V., 2019. Modified fractional order IMC design based drug scheduling for cancer treatment. *Computers in biology and medicine*, 109, pp.121-137 [SCI IF 4.589]
- c. **Yadav J.**, Rani A., Singh V. and Murari B.M., 2018, "Levenberg–Marquardt-based non-invasive blood glucose measurement system," *IETE Journal of Research*, 64(1), pp.116-123 [SCI IF 2.333].

7. Bio-Sketch: Dr. Jyoti Yadav received her B.Tech degree in Biomedical Engineering from Guru Jambheshwar University, Hissar, Haryana, in 2007 and M.Tech degree in Process Control from Division of Instrumentation and Control Engineering, Netaji Subhas Institute of Technology, University of Delhi in 2011. She did Ph.D. degree in "Some Aspects of Biomedical Signal Monitoring and Control" from Delhi University, in 2018. Currently, she is working as an Assistant professor in the Department of Instrumentation and Control Engineering at Netaji Subhas University of Technology, New

Delhi . She has published many papers in International journals and conferences. She has guided more than 85 B.Tech and M.Tech students. Currently three Ph.D. scholar working under her guidance She has received Gowri Memorial Award-2019 by IETE for her paper titled, “Levenberg–Marquardt-based non-invasive blood glucose measurement system” Jyoti Yadav, Asha Rani, Vijander Singh and Bhaskar Mohan Murari published in IETE Journal of Research Vol 64 No 1, Jan-Feb 2018. . She has IEEE membership and is a life member of Indian Society for Technical Education (ISTE) and *Institution of Electronics and Telecommunication Engineers (IETE)*. She is regularly reviewing articles for some International journals and TPC member in many conferences. She has delivered expert lectures in short term courses. Her research interests include Biomedical Instrumentation, Biomedical signal processing, Physiological Control system, noninvasive glucose monitoring and control.

4.14 Ms. Manisha

1. Designation, Qualifications: Assistant Professor, M.Tech

2. Areas of Interest: Power Electronics, Hybrid Energy Systems and Renewable Energy

3. E-mail: manisha.singh@nsut.ac.in

4. Phone: 9582012005

5. Home Page: <http://www.nsut.ac.in>

6. Latest Publications:

a. IshaniBhaumik, Manisha, “Thermodynamic Assessment of a Concentrated Photovoltaic Thermoelectric System”, ICACM2019 conference.

b. Priti Yadav, Manisha, Prerna Gaur, “Electromechanical Modelling and Simulation of Piezoelectric Vibration Based Energy Harvester Interfaced with MPPT Electrical Circuit Using MATLAB”, ICCET 2019.

c. Mohd. Juned, Manisha, Prerna Gaur, “Effect of Higher Order DC-DC Converter on Solar fed BLDC Motor Driven Water Pumping System”. Student Conference on Engineering and systems, SCES-2019.

7. Bio-Sketch: Mrs. Manisha completed her B. E. (Instrumentation & Control Engineering) from PDM College of Engineering, Bahadurgarh, Maharishi Dayanand University, Rohtak, Haryana, July-2010 and M. Tech (Electrical Engineering (Instrumentation & Control) from DeenbandhuChotu Ram



University of Science and Technology, Murthal, Haryana in December-2010. She is pursuing PhD from Netaji Subhas Institute of Technology, Dwarka, New Delhi, affiliated to University of Delhi, in Hybrid Energy Systems. She started her academic career as an Assistant Professor in the Department of Electrical Engineering, PDM College of Engineering for Women's, Bahadurgarh, Haryana for one year and Department of Electrical Engineering, Delhi Technical University, Delhi for two years. At present, she is working as an Assistant Professor in NSUT.

4.15 Dr. Bhavnesh Kumar

1. Designation, Qualifications: Assistant Professor, Ph.D.

2. Areas of Interest: Electric drives, Renewable Energy

3. E-mail: kumar_bhavnesh@yahoo.co.in

4. Phone: 8745973738

5. Home Page: <http://www.nsut.ac.in>

6. Latest Publication:

a. Kundan Anand, Alok Prakash Mittal, Bhavnesh Kumar, "Modelling and simulation of dual heating of substrate with centralized temperature control for anaerobic digestion process", Journal of Cleaner Production, vol.325, 2021.<https://doi.org/10.1016/j.jclepro.2021.129235>.

b. Karan Yadav, Bhavnesh Kumar, Swaroop D., "Mitigation of Mismatch Power Losses of PV Array under Partial Shading Condition using novel Odd Even Configuration", Energy Reports, vol. 6, pp. 427-437, 2020.

c. Urvashi Chauhan, Vijander Singh, Bhavnesh Kumar, Rani, Asha, "An improved MVO assisted global MPPT algorithm for partially shaded PV system", Journal of Intelligent & Fuzzy Systems, vol. 38, no. 5, pp. 6715-6726, 2020.

7. Bio-Sketch: Dr. Bhavnesh Kumar is an Assistant Professor in the area power electronics & drives at Division of Instrumentation & Control Engineering, NSUT Delhi. He holds Bachelor of Technology in Electrical & Electronics from Uttar Pradesh Technical University, Lucknow and Master of Technology in Control & Instrumentation from Motilal Nehru National Institute of Technology, Allahabad. He holds a Ph.D. from Gautam Buddha University, Greater Noida in the area of artificial intelligent controllers for induction motor drives. With a teaching experience of more than five years



he had served GBU, Greater Noida, Airports Authority of India, KNGD Modi Engineering College, Modinagar. He has published various research papers in journals and conferences. He has presented his research work in many international conferences. He is a member of various professional bodies such as Institute of Electrical and Electronics Engineers (IEEE), International Association of Computer Science and Information Technology (IACSIT).

4.16 Dr. Anuradha Tomar

1. Designation, Qualifications: Assistant Professor, Post Doctorate (TU/e, the Netherlands), Ph.D. (IIT Delhi).

2. Areas of Interest: Operation & Control of Renewable Energy Systems, Artificial Intelligent & Machine Learning Applications in Power System

3. E-mail: anuradha.tomar@nsut.ac.in

4. Phone: +91-9560508119

5. Home Page: <http://www.nsut.ac.in/division/ice/faculty/>

6. Latest Publications:

1) Anuradha Tomar, Addressing virtual asymmetry of photovoltaic greenhouse with comprehensive AOMH based SWAPP approach, Sustainable Energy Technologies and Assessments, Volume 47, 2021, 101512, ISSN 2213-1388, <https://doi.org/10.1016/j.seta.2021.101512>. Impact factor- 5.353.

2) Anuradha Tomar, D.S. Shafiullah, P.H. Nguyen, Marcel Eijgelaar, An integrated flexibility optimizer for economic gains of local energy communities — A case study for a University campus, Sustainable Energy, Grids and Networks, Volume 27, 2021, 100518, ISSN 2352-4677, <https://doi.org/10.1016/j.segan.2021.100518>. Impact factor- 5.353. Impact factor- 3.899.

3) Shadab Murshid, Mohammad Tayyab, Adil Sarwar, Mohd Tariq, Ahmed Al-Durra, and Anuradha Tomar, “Self-Balanced Twenty Five Level Switched-Capacitor Multi-level Inverter with Reduced Switch Count and Voltage Boosting Capability”, IEEE Transaction on Industrial Applications (inpress).



- 4) Anuradha Tomar, S. Mishra and C. N. Bhende, "AOMH-MISO based PV-VCI Irrigation System Using ASCIM Pump", IEEE Transactions on Industry Applications, Vol. 54, Iss. 5, Pp. 4813-4824, Sept.-Oct. 2018, DOI: 10.1109/TIA.2018.2839728, May 2018, Impact factor 3.347.
- 5) Anuradha Tomar, Sukumar Mishra, "CMPVI based MIDO Scheme under SSE for Optimum Energy Balance & Reduced ROI", IEEE Transactions on Sustainable Energy, Vol. 9, Iss: 3, Pp. 1318-1327, DOI: 10.1109/TSTE.2017.2782685, July 2018, Impact factor 7.65.
7. Bio-Sketch: Dr. Anuradha Tomar has 12 years of experience in research and academics. She is currently working as Assistant Professor in Instrumentation & Control Engineering Division of Netaji Subhas University, Delhi, India. Dr. Tomar has completed her Postdoctoral research in Electrical Energy Systems Group, from Eindhoven University of Technology (TU/e), the Netherlands and has successfully completed European Commission's Horizon 2020, UNITED GRID and UNICORN TKI Urban Research projects. She has received her B.E Degree in Electronics Instrumentation & Control with Honours in the year 2007 from University of Rajasthan, India. In the year 2009, she completed her M.Tech Degree with Honours in Power System from National Institute of Technology Hamirpur. She has received her Ph. D in Electrical Engineering, from Indian Institute of Technology Delhi (IITD). Dr. Anuradha Tomar has committed her research work towards the development of sustainable, energy efficient solutions for the empowerment of society, humankind. Her areas of research interest are Operation & Control of Microgrids, Photovoltaic Systems, Renewable Energy based Rural Electrification, Congestion Management in LV Distribution Systems, Artificial Intelligent & Machine Learning Applications in Power System, Energy conservation and Automation. She has authored or co-authored 69 research/review papers in various reputed International, National Journals, and Conferences. She is an Editor for books with International Publication like Springer, Elsevier. Her research interests include photovoltaic systems, microgrids, energy conservation, and automation. She has also filled seven Indian patents on her name. Dr. Tomar is Senior member of IEEE, Life member of ISTE, IETE, IEI, and IAENG.

4.17 Dr. Alok Agrawal

1. Designation, Qualifications – Assistant Professor,
B.Tech.,

M.Tech., Ph.D.

2. Area of Interest – Power Electronics for Renewable
Energy,

Renewable Energy Prediction

3. Email – alok.agrawal@nsut.ac.in

4. Phone- 9410082765

5. Homepage – www.nsut.ac.in

6. Latest Publications-

a. Alok Agrawal and Rajesh Gupta, “Power management and operational planning of multiport HPCS for residential applications,” IET Generation, Transmission and Distribution, vol. 12, no. 18, pp. 4194 – 4205, Oct. 2018.

b. Alok Agrawal and Rajesh Gupta, “Stochastic monte-carlo based voltage variation analysis for low voltage hybrid DC/AC radial distribution feeders interfaced with DERs,” IET Generation, Transmission and Distribution, vol. 13, no. 6, pp. 868 – 880, March 2019.

c. Alok Agrawal and Rajesh Gupta, “Distributed co-ordination control of hybrid energy resources for power sharing in coupled hybrid DC/AC microgrids using the paralleled IFCs/ILCs,” IET Smart Grid, vol. 2, no. 1, pp. 89 – 105, March 2019.

d. Alok Agrawal, Chandra Sekhar Nalamati and Rajesh Gupta, “Hybrid DC/AC zonal microgrids enabled by solid-state transformer and centralized ESD integration,” IEEE Transactions on Industrial Electronics, vol. 66, no. 11, pp. 9097 – 9107, November 2019.

e. Chandra Sekhar Nalamati, Alok Agrawal and Rajesh Gupta, “Multiple parallel connected DAB based solid state transformer for hybrid DC/AC microgrid system,” IET Generation, Transmission and Distribution, vol. 14, no. 25, pp. 6359 – 6370, Dec. 2020.

7. Biosketch – Dr. Alok Agrawal received the B.Tech. degree in Electrical Engineering from Uttar Pradesh Technical University, Lucknow, India, in 2012; the M.Tech. degree in Power Electronics & Drives from the National



Institute of Technology Kurukshetra, India, in 2015; and the Ph.D. degree in Electrical Engineering from Motilal Nehru National Institute of Technology Allahabad, Prayagraj, India, in 2019. He had worked with the Delhi Transco Limited (DTL), a national capital region power transmission utility under the Government of NCT, Delhi, from 2018-2021. His 03 years in-hand experience includes working at Operation, Protection and Automation Control Departments of the High Voltage air/gas -insulated 400 KV and 220 KV electric substations. Currently, Dr. Agrawal is associated with the Netaji Subhas University of Technology (NSUT), Delhi, as an Assistant Professor in the Instrumentation and Control Engineering Department, since September, 2021. His research interests include Power electronics control for Renewable Energy System (RES) applications, Impact of RES integration on distribution feeders, Load / renewable energy prediction methodologies.

4.18 Prof. Subrata Mukhopadhyay

1. Designation, Qualifications: Adjunct Faculty (Professor), Ph. D.
2. Areas of Interest: Control Systems, Power & Energy
3. E-mail: subrata@nsut.ac.in, subrata@ieee.org
4. Phone: +91-9811477956, 9968294972, 011-43098372
5. Home Page: <http://www.nsut.ac.in>
6. Latest Publication:
 - a. Indian Power System Operations during COVID-19 Pandemic, presented in the 14 th IEEE PES Power Tech Conference, Comillas University, Madrid, Spain, Jun 28-Jul 2, 2021, paper # 307 (with Aman Gautam, Rahul Shukla, Mohit Kumar Gupta, R.K. Porwal, Debasis De, S.R. Narasimhan, S. S. Barpanda, Sushil K. Soonee, and K V S Baba as co-authors)
 - b. Long Term Planning for Indian Power Sector with Integration of Renewable Energy Sources, presented in the 2020 IEEE Ninth Power India International Conference, DCRUST, Murthal, Haryana, India, Feb 28-Mar 01, 2020, paper #1570621522 (with Pankaj Batra, Sandesh Sharma, Praveen Gupta, Brijesh K Arya, Ashok K Rajput, and Vijay Menghani as co-authors)
 - c. Renewable Energy Integration in India: Present State and Long-Term Perspective, presented in the 13th IEEE PES Power Tech Conference,



Polytechnic of Milan, Bovisio, Milan, Italy, Jun 23-26, 2019, paper # 587 (with Sushil K Soonee, Samir C Saxena, K V S Baba, S R Narasimhan, K V N Pawan Kumar, Praveen K Agarwal, and Pankaj Batra as co-authors)

- d. Flexibility in Indian Grid Operation with High Penetration of Grid-Connected Renewable Energy, presented in the 2018 IEEE Eighth Power India International Conference, National Institute of Technology, Kurukshetra, Haryana, India, Dec 10-13, 2018, paper #1570471614 (with Sushil K Soonee, Samir C Saxena, KVS Baba, S R Narasimhan, and KVN Pawan Kumar as co-authors)
 - e. Grid Resilience in Indian Power System, presented in the 2018 IEEE Eighth Power India International Conference, National Institute of Technology, Kurukshetra, Haryana, India, Dec 10-13, 2018, paper #1570473401 (with Sushil K Soonee, Samir C Saxena, KVS Baba, S R Narasimhan, and KVN Pawan Kumar as co-authors)
 - f. Wind-Solar Hybrid System – An Innovative and Smart Approach to Augment Renewable Generation and Moderate Variability to the Grid, presented in the 2016 IEEE Seventh Power India International Conference, Govt. Engineering College, & The Lallgarh Palace - a heritage hotel, Bikaner, Rajasthan, India, Nov 25-27, 2016, paper no.110 (with Vinod K Agrawal, Archit Khemka, Krishna Manoharan, and Dheeraj Jain as co-authors)
 - g. Detecting Low Frequency Oscillations Through PMU-Based Measurements for Indian National Grid, presented in the 19th Power Systems Computation Conference, Genoa, Italy, Jun 20-24 2016, paper no. 315 (with Sushil K. Soonee, Vinod K. Agrawal, P. K. Agarwal, Rajkumar Anumasula, and Chandan Kumar as co-authors)
7. Bio-sketch: Dr. Subrata Mukhopadhyay graduated in Electrical Engineering from Jadavpur University, Calcutta in 1968 and had his Master's in Electrical Engineering with specialization in Power System Engineering and Doctorate from Indian Institute of Technology, Kharagpur and Roorkee (erstwhile University of Roorkee) in 1970 and 1979 respectively. His employment experience of above five decades includes power system planning, design and operation with the Central Electricity Authority of Government of India serving up to the level of Senior-most Chief Engineer (now re-designated as Principal Chief Engineer) in the Central Power Engineering Services cadre before retirement in 2007. He had been Director of HVPNL, the TRANSCO of the state of Haryana, also.

In the academic side he had the experience of teaching, research and administration in Roorkee, IILM Academy, Greater Noida, UP as Director and Professor in EE, Lingaya's University, Faridabad, Haryana as Founder Vice Chancellor, GTBIT of GGS IndraPrastha University as Professor and Dean (Academics), BVCOE of the same University as Adjunct Professor. Currently he is with the ICE & EE Department of NSUT as Adjunct Faculty (Professor). He has authored two monographs / books and forty-nine papers, produced several exemplary Reports for the Indian Power Sector, won IEEE Third Millennium Medal in 2000, IEEE PES Delhi Chapter Outstanding Engineer Award and IEEE PES Asia-Pacific Regional Outstanding Engineer Award for 2001, IEEE Regional Activities Board Leadership and Achievement Awards in 2002 and 2004 respectively. Currently he is the Chair of Asian and Australasian Electricity Infrastructure Working Group of International Practices Subcommittee (IPSC) of IEEE PES with responsibility to organize Panel Sessions in the IEEE PES General Meeting every year, Advisor to PES India Chapters Council, and Member of IEEE PES Nomination & Appointment Committee (2020-21). From 2002 to 2014 he served as Chair of ET 01 Basic Electro-technical Standards Committee of Bureau of Indian Standards, statutory body of Government of India in framing standards, and during 12th five-year plan (2012-17) as Member of High-Power Committee on R & D for Hydro-Power Development in India.

4.19 Prof. Ved Ram Singh

1. Designation / Qualification: Adjunct Professor, Ph.D (IIT Delhi)
2. Area of Interest: Electronic Instrumentation and Measurements, and Transducers, Biomedical Instrumentation and Standards, Computer Modeling and Simulation, Biomedical Ultrasonics and Medical Acoustics, POCT Devices, Neuro Sensors and Implants, Nano-Cancer-Technology, Cancer Hyperthermia and Lithotripsy, WSN and U- Technology
3. Email: vrsingh@ieee.org; vrsingh@nsut.ac.in
4. Phone/ Mobile: 9811574636
5. Homepage: www.nsut.ac.in
6. Latest Publications:



- a. Malik, NK and Singh, VR, 2016, “A human inspired cognitive wheelchair navigation system” International Journal of Human Factors Modelling and Simulation(USA) 5 (3), 263-284, .
 - b. Singh, VR, Kumari, Meena, Swapnil, S and Ranjan, R “Weather sensitive load flow analysis of radial distribution system”, 2018, Journal WSEAS Transactions on Power Systems, Vol 13, Pages 78-88
 - c. Malik, N.K., Singh, V.R. 2015 “A cognitive architecture for assistive technology in healthcare”, CSIT (Springer), 3,99–109 (2015). <https://doi.org/10.1007/s40012-016-0078-z>
7. Bio-Sketch: Prof. (Dr) V.R.Singh, Ph.D. (Electrical Engg), IIT-Delhi and Life Fellow- IEEE and LF-IETE, LF-IEI, LF-ASI/USI and LF-IFUMB/WFUMB, has over 38 years of research-cum-teaching experience in India and abroad (Univ of Toronto-Canada, KU Leuven- Belgium, Korea Univ, South Korea, TU-Delft, Netherlands, Univ of Surrey/Southampton, UK, PTB-Germany and others). He has been at National Physical Laboratory (NPL), New Delhi, as a Director-grade-Scientist/ Head of Instrumentation, Sensors & Biomedical Measurements and Standards, as well as Distinguished Professor (AICTE/INAE). He has over 350 papers, 250 talks, 260 conf papers, 4 books, 14 patents and 30 consultancies to his credit. Under his guidance, 35 PhD scholars have earned PhD degree while others are working with him. He is the Mentor/Advisor of PDM University.

Dr. Singh has been the Associate Editor of IEEE Int Sensor Journal (2010-2016), and is Associate Editor of IEEE Transactions, Editorial Board Member, Biomedical Engineering Letters (BMEL) and Regional Editor of Int Journal of Biomedical Engineering and Technology (IJBET). Apart from this, he is on Editorial/Reviewer Boards of other journals. like Sensors & Actuators (Switzerland), IEEE Trans on Engg in Med and Biology , J Computers in Electrical Engg (USA), J.InstnElectr Telecom Engrs, J.InstnEngrs -India, Ind J Pure &Appl Physics, J.ofInstrmSocInd, J. Pure &ApplUltrasonics, J. Life Science Engg, etc.

4.20 Prof. R. P. Dahiya

1. Designation / Qualification: Adjunct Professor, Ph.D
2. Area of Interest: Instrumentation, Biomedical, Environmental Studies.
3. Email: rpdahiya@gmail.com
4. Phone/ Mobile:
5. Homepage: www.nsut.ac.in



6. Latest Publications:

- a. I sharawat Malik, R. Dahiya, 2020, "Analysis of a wastewater treatment plant for energy consumption and greenhouse gas emissions", International Journal of Environmental Science and Technology.
- b. IshaSharawat, R. P. Dahiya, "Policy options for managing the water resources in rapidly expanding cities: a system dynamics approach" Journal of Sustainable water resources management, 2019.

7. Bio-Sketch: Prof. (Dr)R.P Dahiya, former Professor of Centre for Energy Studies Department of Biochemical Engineering and Biotechnology Indian Institute of Technology Delhi, India, former Vice chancellor of DeenbandhuChhotu Ram University of Science and Technology, Murthal (Sonepat), India, former Vice chancellor of DCR university of Science and Technology, former Director of Malaviya National Institute of Technology Jaipur, former Vice Chancellor of Chaudhary Devi Lal University, former Visiting Researcher and Scientist at Technische Universiteit Eindhoven, Netherlands.

Research scholars:

S.N.	Name of Scholar	Supervisor(s)
1	Ravikant	Prof. Asha Rnai
2	Minakshi Singh	Prof. A.P. Mittal
3	Rashmi Raghav	Prof. A.P. Mittal
4	Anita Mudgal	Prof. Vijander Singh
5	Saumya Singh	Prof. Smriti Srivastava

6	Akashdeep Verma	Prof. Prerna Gaur
7	Mirza Tabish Shah Beg	Prof. KPS Rana Prof. Vineet Kumar
8	Sudhanshu Shekhar Jha	Prof. KPS Rana
9	Shiv Sagar Singh	Prof. Rajneesh Sharma
10	Mamta Rani	Dr. Jyoti Yadav
11	Durgesh Nandini	Dr. Jyoti Yadav

5. LABORATORY INFRASTRUCTURE

Each state-of-the-art laboratory is managed by a Faculty-In-Charge and staff-in-charge and has the best-of-breed equipments.

5.1. Advanced Process Control Lab (Room No. 216, Block VI)

General information about lab

The Advanced Process Control Lab is developed to trained our undergraduate and postgraduate students with the advanced concepts used in the process industries. Also, very good research facilities in the field of process dynamics and control along with the robotics are available in the lab. Some of the facilities are study of MODBUS concept, process control rig with level, flow control loops, control valve characteristic (equal percentage), cascade control loop, ratio control loop and feed forward control loop. The lab has latest data acquisition systems with National Instrument (NI) software LabVIEW. Many research scholars are working in the lab and contributing hardware oriented research papers in the leading technical journals in the world.

Lab Homepage: <https://apclnsit.wordpress.com/>

Facilities available

Plant / Process / System

- DC Motor
- Process Rig (Flow, level, Temperature loop) M/s Bytronis UK; M/s Anshuman Tech India

- Simple feedback loop
- Cascade loop
- Ratio control
- Inverted pendulum
- Omni Bundle for robotics application M/s Quanser Canada
- NI LabVIEW Robotics Starter Kit for Prototyping

For real time control

- PXI
- FPGA
- NI compact field point (cFP)
- NI compactRIO

Data acquisition systems and NI based hardware

- NI DAQ CARD
- NI DAQ (USB based)
- NI ELVIS
- Speedy
- MODBUS demo box

Software

- LabVIEW™; Matlab

5.2 Instrumentation Lab

General information about lab

The lab aims as a novel experimental teaching aid to the students of Instrumentation and Control Engineering at UG and PG levels in addition to the students from Manufacturing and Process Automation Engineering. The facilities in the lab are for teaching the fundamentals of the instrumentation including both the classical trainer based desktop kits and also the latest state of the art computer based systems on virtual instrumentation. Various types of transducers, data acquisition systems and Virtual Instrumentation using LabVIEW are the main components in

the laboratory in addition to the computing facility. This lab has become famous among the students and many top ranking students have dream to work and get associated to this laboratory. Industrial consultancies are the next components being planned to be introduced in the lab.

Following are the key instrumentation systems in this laboratory:

1. PDS LabVIEW S/W
2. Multisim
3. MATLAB
4. NI-PXI based FPGAs
5. NI DAQs
6. NI-EIVIS
7. Electrodynamic shaker system
8. Fluke dry well thermal calibrator (-20°C – 120 °C)
9. PC based Measurement of
 - Acceleration
 - Temperature
 - Strain
 - Displacement using LVDT
10. GC
11. AAS
12. DMMs
13. AFGs
14. DSOs
15. Spectrum analyzer

5.3 Control Engineering Lab (Room No.-112, Block - VI)

General information about lab

This Laboratory caters to the need of Post Graduate (Process Control), and Undergraduate students of all branches such as Electronics and

Communication Engineering, Computer Engineering, Instrumentation and Control Engineering, and Manufacturing Processes & Automation Engineering. This laboratory helps the students in understanding various controllers by providing them practical knowledge.

In this laboratory practicals are performed on various kits like: Transducer Trainer Kit, Potentiometer Error Detector, Temperature Controller System, Synchro Transmitter Receiver, DC Motor and AC Servo Motor control. Experiments on DC motor(CA06) are also performed. There is a mentor graphics tool for simulation of analog and digital circuits in the lab. Digital Storage Oscilloscopes (DSO) and Function Generators are also available. All types of simulations in continuous and discrete domain can be performed using MATLAB on computers. Associated with this is the block diagram simulation software SIMULINK, which is also used.

Experiments have been designed to observe and validate the time response and frequency response of control systems, performance criteria for optimizing the transient response, and system parameter identification. Students simultaneously work out the solution on the PCs using MATLAB and see exactly how the theoretical and practical observation differ.





5.4 Electronics and Electrical Engineering Lab/ Measurement Lab

General information about lab

The PEE / ELECT. MEAS. Laboratory is located on the first floor of the ICE Division in Room No. 142 Block VI. In this laboratory, students of B. E. IInd Semester and IIIrd Semester of all the branches come to perform the

basic experiments. The experiments have been designed so that the students learn the basics of engineering.

The experiments are divided into two types:

- Hardware based
- Software based

Hardware Based: Though the world is moving fast towards digitization, some basic hardware experiments have been set up based on the syllabus of the theory courses. The experiments include:

- Virtual Instrumentation kits for performing experiments on DC network theorems, series RC, RL, RLC circuits.
- Measurement of power and power factor of circuits using 3-ammeter and 3-voltmeter method. Measurement of power and power factor of circuits using 3-ammeter and 3-voltmeter method.
- Measurement of resistance of metals and non-metals and study the effect of temperature on resistance, measurement of power consumed by pure R, L and C elements.

Software Based: Pspice based experiments have been designed for circuit simulation.

For research purposes, the equipments existing in the lab are:

- Trainer kits of AVR, PIC and ARM microcontrollers.





5.5 Power Electronics and Drives lab: (Room No. 008, Block -VI)

General information about lab

This lab provides practical understanding and demonstration to the undergraduate and postgraduate students about the various components of electrical drives. This lab demonstrates the coordinated working and control of various components of electrical drives. The experimentation comprises the various setups for the control of ac motor drives including induction motors and synchronous motors fed through inverter/cyclo-converter/ac voltage regulator. It also has a setup to demonstrate control of dc motors (separately excited and self excited) fed through a chopper or rectifier. The lab also provides a learning environment to understand the challenges in data acquisition and controller design for electrical drives.

5.6 Industrial Electronics Lab (Room No 213, Block VI)

General information about lab

Industrial Electronics Lab focuses on Power Electronics, Renewable Energy and Electrical Drives engineering. The Practicals designed in Lab are Renewable Energy Sources based using Custom Power Devices, DSP EVM boards, kits and d-Space based drive systems. IE Lab also provides resources for creating Electrical drives, Power Electronics based systems, emphasizing renewable Energy systems, emergency and backup Electric power sources and power quality systems. IED Lab is also advancing the

matrix converters concept to a wide variety of next generation, energy efficient and environment friendly applications.

Facilities available:

1. Softwares: PSPICE, Multisim, MATLAB
2. Hardware: dSPACE-1104, DC- DRIVES, AC- DRIVES, POWER ELECTRONICS TRAINER KITS, Power Supplies, Function Generators, CRO, 3- Phase Power Analyzer, 1-phase Power Analyzer, Digital Multimeters, DSP (TI-320-2822, 2407), Projectors, fast speed Internet connection and latest configuration of PCs.



5.7 Simulation/ Computer Lab (Room No 120, Block-VI)

General information about lab

The purpose of the simulation lab is to perform mathematical modelling and numerical simulations of the different physical systems. Students will learn how to model complex systems using mathematical modelling, debugging, testing and analysing the system responses under various operating parameters and control scenarios. This will help students to understand the basics concepts and verify the system performance by performing various simulations. It enables students/researchers to develop methodologies, design system architectures and improve the system's response based on the outcome of the numerical simulations. It

facilitates students to design, analyse performances both at the system level as well as component levels. and Students can perform mathematical modelling and numerical simulation related to Power system, Control methods, Biomedical instrumentation, Power electronics, Artificial intelligence, Power system analysis in this laboratory.

This laboratory is fully air conditioned and well equipped with computers facility, various types of required software are as following:

- MATLAB/SIMULINK
- LabVIEW
- PSS
- Python
- C++



5.8 Process Control Lab (Room No. 010, Block VI)

General information about lab

The Process Control Lab provides training to the students (B.E (Instrumentation & Control), M.Tech(Process Control), and PhD) in the field of Process Instrumentation, control and optimization. A number of PCs are interfaced with Hydraulic, Electro-pneumatic and Electro-Hydraulic systems which are available to demonstrate dynamic processes and to

monitor process variables. New equipments like Inverted Pendulum, 3 degree of freedom helicopter have been incorporated in the lab to enable students and scholars to work in the field of nonlinear system environment. Inverted pendulum systems make good bench top demonstrations of automatic control techniques. They are nonlinear, unstable systems which showcase modern control methods and have the added bonus of being exciting to watch. This laboratory has an inverted pendulum rig provided by the Educational Control Products Company. It is not the conventional rod-on-cart inverted pendulum, but rather steers a horizontal rod in the presence of gravity to balance and control the vertical rod. The 3 DOF Helicopter system is a simplified helicopter model, ideally suited to introduce intermediate to advanced control concepts and theories relevant to real world applications of flight dynamics and control in tandem rotor helicopters, or any device with similar dynamics. Students learn to develop a state-space model of the system, design a state-feedback controller to regulate the elevation and travel angles of the 3 DOF Helicopter, simulate the closed-loop position controller and evaluate its performance using the linear model of the 3 DOF Helicopter, implement the designed controller on an actual system and evaluate its performance.

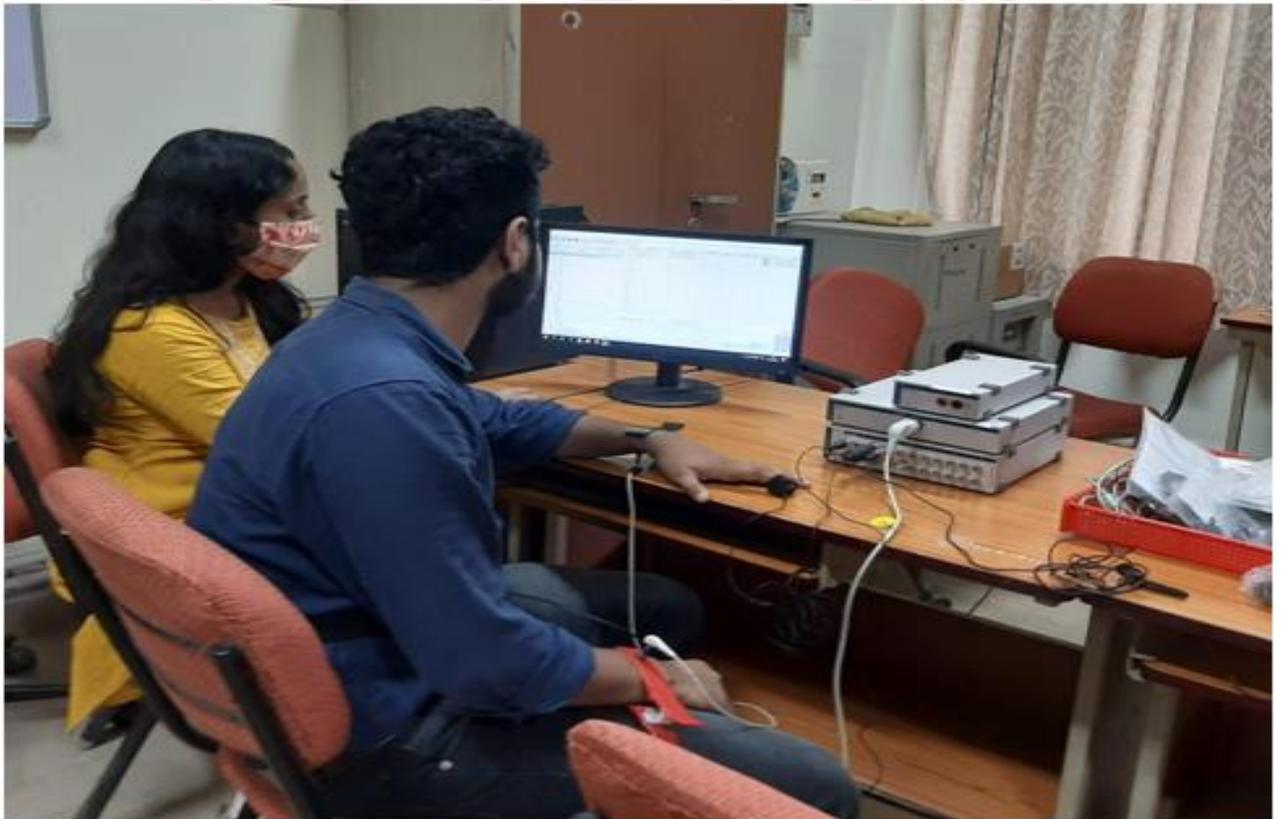




5.9 Biomedical Instrumentation Lab

Biomedical Instrumentation Lab is developed to educate our students to understand the fundamental understanding of human body functioning and biological signal monitoring and to use that Also, to provide a multidisciplinary research in Bio Medical Instrumentation to develop better medical diagnostic/ therapeutic strategies and medical devices. At present Facility of Biomedical Data acquisition is available using AD Instruments PL3516 Power Lab 16/35 data acquisition system. The AD Instruments system has 16 bit (313 microV resolution in the 610V range) resolution. The Lab has latest facility of NI Educational Laboratory Virtual Instrumentation Suite (NI ELVIS) II which is a modular engineering educational laboratory platform. Design and prototyping platform for measurement and instrumentation, circuits, controls, telecommunications and embedded/MCU experiments.

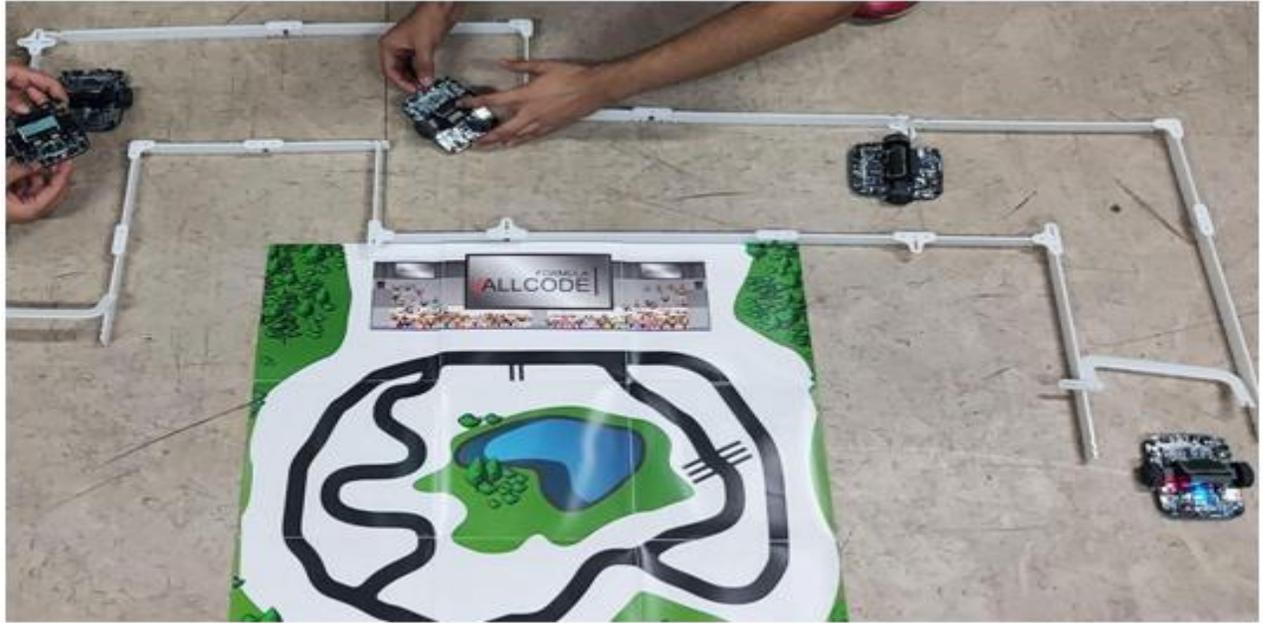




5.10 Robotics Lab:

Robotics Lab is developed to educate UG and PG students to understand the fundamental of pick and place operations as well as the applications in industry. The Lab has 3-mitsubishi arms where students used to understand real time operation of manipulators. These manipulators are interfaced with MATLAB and other platforms. Formula all code ROBOT is available in the lab for performing navigation in a maze and other tasks. Inverted pendulum and omni bundle robot are also available for studying the behavior of robotic systems. Apart from this, simulation of robotic manipulators is also done to test their behavior under the influence of different inputs. The Research students are working on robotic manipulator as well as double inverted pendulum and designing various controllers to improve the efficiency of the robotic arm.





6.ELIGIBILITY WITH RESPECT TO BACHELORS & MASTERS DEGREE.

List of Degrees in B. Tech. / B.E./B.Sc. Engg. Considered for admission

1. Instrumentation & Control Engineering/Instrumentation/ Electrical Engineering/Electrical & Electronics Engineering/Electronics Engineering/Electronics and Communication Engineering/Electronics and Instrumentation Engineering/Applied Electronics and Instrumentation Engineering or equivalent.

With M. Tech specialization in any of the branches mentioned in Table below.

S.No.	Name of the Course	S.No.	Name of the Course
1.	Advanced Electrical Power System	140.	Mechatronics
3.	Applied instrumentation	141.	Medical Electronics
5.	Artificial intelligence	142.	Modeling and Simulation
7.	Automation and Control Power Systems	143.	Nano Science and Technology
9.	Automation and Robotics	144.	Nanotechnology
11.	Automobile Engineering	145.	Neural Networks
13.	Bio Electronics	146.	Power and Energy Engineering

15.	Biometrics and Cyber Security	147.	Power and Energy System
17.	Bioinformatics	148.	Power and Industrial Drives
19.	Biomedical Electronics	149.	Power Control and Drives
21.	Biomedical Engineering	150.	Power Electronics
23.	Biomedical instrumentation	151.	Power Electronics and Control
25.	Biomedical Signal Processing and instrumentation	152.	Power Electronics and Drives
27.	Control and Instrument	153.	Power Electronics and Drives in Electrical Engineering
29.	Control and Instrumentation	154.	Power Electronics and Electrical Drives
31.	Control Engineering	155.	Power Electronics and Machine Drives/Power apparatus and systems
33.	Control System Engineering	156.	Power Electronics and Power Systems
35.	Control Systems	157.	Power Electronics and Systems
37.	Digital Image Processing	158.	Power Electronics Engineering
39.	Digital Signal Processing	159.	Power Engineering
41.	Electric Power System	160.	Power Engineering and Energy Systems
43.	Electrical and Electronics (Power System)	161.	Power Plant Engineering and Energy Management
45.	Electrical and Electronics Engineering	162.	Power System and Control
47.	Electrical and Mechanical Engineering	163.	Power System and Control Automation
49.	Electrical and Power Engineering	164.	Power System Control and Automation
51.	Electrical Devices and Power Systems	165.	Power System with Emphasis H. V. Engineering
53.	Electrical Drives and Control	166.	Power Systems

55.	Electrical Energy Systems	167.	Power Systems and Automation
57.	Electrical Engineering	168.	Power Systems and Power Electronics
59.	Electrical Engineering (Electronics and Power)	169.	Power Systems and Renewable Energy
61.	Electrical Engineering (Instrumentation and Control)	170.	Power Systems Control and Automation Engineering
63.	Electrical instrumentation and Control Engineering	171.	Power Systems Engineering
65.	Electrical Machines	172.	Process Control
67.	Electrical Machines and Drives	173.	Process Control instrumentation
69.	Electrical Power Engineering	174.	Process Dynamics and Control
71.	Electrical Power System	175.	Process instrumentation
73.	Electronic Circuits and System Design	176.	Renewable Energy
75.	Electronic instrumentation and Control Engineering	177.	Robotics and Automation
77.	Electronics and instrumentation Engineering	178.	Robotics and Mechatronics
79.	Electronics Communication and instrumentation Engineering	179.	Sensor Technology
81.	Embedded Control Systems	180.	Signal Processing
83.	Energy and Environmental Management	181.	Signal Processing and Communications
85.	Energy Engineering	182.	Signal Processing and Embedded Systems
87.	Energy Management	183.	Solar Power Systems
89.	Energy Science and Technology	184.	Industrial Instrumentation and Control
91.	Energy Systems	185.	Industrial Power Control and Drives
93.	Energy Systems Analysis and Design	186.	Power Apparatus and Systems.
95.	Energy Systems and Management	187.	Information and Communication Technology
97.	Energy Systems Engineering	188.	Information Engineering

99.	Energy Technology	189.	Information Science and Technology
101.	Energy Technology and Management	190.	Information Security
103.	High Voltage and Power Systems Engineering	191.	Information Security Management
105.	High Voltage Engineering	192.	Information Systems
107.	Image Processing	193.	Information Technology
109.	Industrial Automation and Robotics	194.	Information Technology (Artificial Intelligence and Robotics)
111.	Industrial Drives and Control	195.	Information Technology (Information and Cyber Warfare)
113.	Industrial Electronics	196.	Information Technology and Engineering
115.	Industrial System and Drives	197.	Computer Engineering
117.	Industrial Systems Engineering	198.	Computer Engineering (software Engineering)
119.	Instrumentation and Control (Applied Instrumentation)	199.	Computer Engineering and Application
121.	Instrumentation and Control Engineering	200.	Computer Networking
123.	Instrumentation and Electronics	201.	Computer Science and Engineering
125.	Instrumentation Engineering	202.	Computer Science and Engineering (Networks)
127.	Instrumentation Technology	203.	Computer Science and information Technology
129.	Integrated Circuits Technology	204.	Computer Science and Systems Engineering
131.	Integrated Power Systems	205.	Computer Science and Technology
133.	Intelligent Systems	206.	Digital Technology & Instrumentation Engineering
135.	Machine Design	207.	Power Electronics electrical Machine & Drives Engineering
137.	Machine Design and Robotics	208.	Power Engineering

139.	Measurement and Control	209.	Electronics & Communication Engineering
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7. SYLLABUS FOR WRITTEN TEST: The entrance test shall consist of 100 multiple choice questions. There shall be no negative marking. 50 questions shall be based on Research Aptitude/Methodology which shall include quantitative methods/computer applications, experimental techniques etc. and 50 questions shall be subject specific. The test shall be of Two hours.

Part A Research Aptitude/Methodology: Common to all departments

Unit-1 Research Aptitude

- Research: Meaning, Types, and Characteristics, Positivism and Post-positivistic approach to research.
- Methods of Research: Experimental, Descriptive, Historical, Qualitative and Quantitative methods.
- Steps of Research.
- Thesis and Article writing: Format and styles of referencing.
- Application of ICT in research.
- Research ethics.

Unit-2 Comprehension & Communication

- A passage of text be given. Questions be asked from the passage to be answered.
- Communication: Meaning, types and characteristics of communication.
- Effective communication: Verbal and Non-verbal, Inter-Cultural and group communications, Classroom communication.
- Barriers to effective communication.
- Mass-Media and Society.

Unit-3 Mathematical Reasoning and Aptitude

- Types of reasoning.
- Number series, Letter series, Codes and Relationships.
- Mathematical Aptitude (Fraction, Time & Distance, Ratio, Proportion and Percentage, Profit and Loss, Interest and Discounting, Averages etc.) Unit-VI Logical Reasoning
- Understanding the structure of arguments: argument forms, structure of categorical propositions, Mood and Figure, Formal and Informal fallacies,

Uses of language, Connotations and denotations of terms, Classical square of opposition.

- Evaluating and distinguishing deductive and inductive reasoning.
- Analogies.
- Venn diagram: Simple and multiple use for establishing validity of arguments.

Unit-4 Data Interpretation

- Sources, acquisition and classification of Data.
- Quantitative and Qualitative Data.
- Graphical representation (Bar-chart, Histograms, Pie-chart, Table-chart and Line-chart) and mapping of Data.
- Data Interpretation.
- Data and Governance.

Unit-5 Information and Communication Technology (ICT)

- ICT: General abbreviations and terminology.
- Basics of Internet, Intranet, E-mail, Audio and Video-conferencing.
- Digital initiatives in higher education.
- ICT and Governance.

NOTE: (i) Equal number of questions are to be set from each Unit.

(ii) Whenever graphical/pictorial question(s) are set for sighted candidates, a passage followed by equal number of questions and weightage be set for visually impaired candidates.

Part B: Department Specific Subject:

Section 1: Electrical Circuits:

Voltage and current sources: independent, dependent, ideal and practical; v-i relationships of resistor, inductor, mutual inductor and capacitor; transient analysis of RLC circuits with dc excitation. Kirchoff's laws, mesh and nodal analysis, superposition, Thevenin, Norton, maximum power transfer and reciprocity theorems. Peak-, average- and rms values of ac quantities; apparent-, active- and reactive powers; phasor analysis, impedance and admittance; series and parallel resonance, locus diagrams, realization of basic filters with R, L and C elements. One-port and two-port networks, driving point impedance and admittance, open-, and short circuit parameters.

Section 2: Signals and Systems

Linear Algebra: Matrix algebra, systems of linear equations, Eigen values and Eigen vectors. Numerical Methods: Matrix inversion, solutions of non-linear algebraic equations, iterative methods for solving differential equations, numerical integration, regression and correlation analysis.

Periodic, aperiodic, step and impulse signals, some operation on signals, shifting and scaling of signals; Laplace, Fourier and z-transforms, application of differential equation and Laplace transform for circuit problem. Waveform synthesis problem; transfer function, frequency response of first and second order linear time invariant systems, impulse response of systems; convolution, correlation. Discrete time system: impulse response, frequency response, pulse transfer function; DFT and FFT; basics of IIR and FIR filters.

Section 3: Control Systems

Feedback principles, signal flow graphs, transient response, steady-state-errors, Bode plot, phase and gain margins, Routh and Nyquist criteria, root loci, design of lead, lag and lead-lag compensators, state-space representation of systems; time-delay systems; mechanical, hydraulic and pneumatic system components, synchro pair, servo and stepper motors, servo valves; on-off, P, P-I, P-I-D, cascade, feedforward, and ratio controllers.

Section 4: Analog Electronics

Characteristics and applications of diode, Zener diode, BJT and MOSFET; small signal analysis of transistor circuits, feedback amplifiers. Characteristics of operational amplifiers; applications of op amps: difference amplifier, adder, subtractor, integrator, differentiator, instrumentation amplifier, precision rectifier, active filters and other circuits. Oscillators, signal generators, voltage controlled oscillators and phase locked loop.

Section 5: Digital Electronics

Combinational logic circuits, minimization of Boolean functions. IC families: TTL and CMOS. Arithmetic circuits, comparators, Schmitt trigger, multi-vibrators, sequential circuits, flip-flops, shift registers, timers and counters; sample-and-hold circuit, multiplexer, analog-to-digital (successive approximation, integrating, flash and sigma-delta) and digital-to-analog converters (weighted R, R-2R ladder and current steering logic).

Characteristics of ADC and DAC (resolution, quantization, significant bits, conversion/settling time); basics of number systems, 8-bit microprocessor and microcontroller: applications, memory and input-output interfacing; basics of data acquisition systems.

Section 6: Measurements

SI units, systematic and random errors in measurement, expression of uncertainty - accuracy and precision index, propagation of errors. PMMC, MI and dynamometer type instruments; dc potentiometer; bridges for measurement of R, L and C, Q-meter. Measurement of voltage, current and power in single and three phase circuits; ac and dc current probes; true rms meters, voltage and current scaling, instrument transformers, timer/counter, time, phase and frequency measurements, digital voltmeter, digital multimeter; oscilloscope, shielding and grounding.

Section 7: Sensors and Industrial Instrumentation

Resistive-, capacitive-, inductive-, piezoelectric-, Hall effect sensors and associated signal conditioning circuits; transducers for industrial instrumentation: displacement (linear and angular), velocity, acceleration, force, torque, vibration, shock, pressure (including low pressure), flow (differential pressure, variable area, electromagnetic, ultrasonic, turbine and open channel flow meters) temperature (thermocouple, bolometer, RTD (3/4 wire), thermistor, pyrometer and semiconductor); liquid level, pH, conductivity and viscosity measurement.

Section 8: Communication and Optical Instrumentation

Amplitude- and frequency modulation and demodulation; Shannon's sampling theorem, pulse code modulation; frequency and time division multiplexing, amplitude-, phase-, frequency-, pulse shift keying for digital modulation; optical sources and detectors: LED, laser, photo-diode, light dependent resistor and their characteristics; interferometer: applications in metrology; basics of fiber optic sensing.

Section 9: Electrical Machines I

Single phase transformer: equivalent circuit, phasor diagram, open circuit and short circuit tests, regulation and efficiency; Three phase transformers: connections, parallel operation; Auto-transformer, Electromechanical energy conversion principles, DC machines: separately excited, series and shunt, motoring and generating mode of operation and their characteristics, starting and speed control of dc motors.

Section 10: Electrical Machine II

Three phase induction motors: principle of operation, types, performance, torque-speed characteristics, no-load and blocked rotor tests, equivalent circuit, starting and speed control; Operating principle of single phase induction motors; Synchronous machines: cylindrical and salient pole machines, performance, regulation and parallel operation of generators, starting of synchronous motor, characteristics; Types of losses and efficiency calculations of electric machines.

6.2.4 DEPARTMENT OF ELECTRICAL ENGINEERING (MAIN CAMPUS)

1. The Department

The Department of Electrical Engineering (*EE*), was established in the year 2019. Electrical engineering is spread across a range of specialties such as power system operation and analysis, smart grid, electric vehicles, renewable energy systems, automobiles to vehicular technology, special electric machines, adjustable speed drives and intelligent control, robotics, unmanned vehicles, remote sensing, renewable energy systems, building energy systems, energy efficiency and management systems. The EE curriculum provides a wide perspective of the different fields and helps the students to decide their future directions.

The department has well-equipped and modern Lab facilities for UG, PG and Ph.D. programs and Research & Development in the University. The department has always been on a progressive path, thanks to the experienced and dedicated faculty members who have a strong commitment towards providing quality engineering education and research. The Department has **7 faculty members, 2 Professors, 01 Emeritus Professor, 04 Assistant Professors** and all the faculty members are Doctoral degree holders.

**Vision:**

To be a department of premier University of global recognition that provides Excellence in Education, Research and Development in the field of Electrical Engineering, to create potential Innovators and leaders to serve Society and Nation.

Mission:

M1. To promote academic growth by offering state-of-the-art Undergraduate, Postgraduate and Doctoral programmes and to impart emerging and new knowledge in Research & Development.

M2. To identify the thrust area of specialization in education based on perception of Regional and National as well as global needs.

M3. To undertake collaborative projects which offer opportunities for long term interaction with leading Academia and industries to cater to the needs of the Society and Nation.

M4. To foster human potential by inculcating responsible behavior, Environment, improvement, Ethics, Innovation and Entrepreneurship.

2. Courses Offered

The Department of Electrical Engineering is currently offering 01 Undergraduate (UG), 01 Postgraduate (PG) and Ph.D program. The rapid developments in the field of Electrical Engineering triggered the inception of PG programme on 'Electrical Engineering' in 2019. In addition, the Department also offers high quality research programmes at the doctoral level.

To keep in pace with the current technological advancements, the UG curriculum has recently been modified, so that the students can get a feel of what exactly is happening outside in the tech-world.

- B.Tech.-Electrical Engineering (150 students - Eight Semesters-Semesters - Choice Based Credit System)
- M.Tech. –Electrical Engineering (30 students - Four Semesters - Choice Based Credit System)
- Doctor of Philosophy (Ph.D.)

3. Areas of Research and Available Vacancies

Our research capabilities provide solutions for clients and partners in a wide range of sectors including those listed below.

The research interests of the faculty include Power Systems Analysis and Control, Power Generation, HVDC, FACTS, Distribution Automation, Power Quality, Energy Systems, Energy Audit and Energy Conservation, Renewable Energy (Wind, Small Hydro, and PV), Electrical Machines and Drives, Power Electronics, Special Electric Machines, Adjustable Speed Drives and Intelligent Motor Control. Instrumentation, FPGA Applications, Robotic systems, Robust Control System, Power Electronics, Artificial Intelligence.

The details of above wide area of research are as follows:

- **Renewable Energy/ grid integration/ Power System & control/ Power Electronics/ Hybrid Energy System/ Electrical Drives/ power quality analysis/ Electric Vehicle/ FACTS**

Research areas include Electric drives for transportation electrification, Advanced power electronics converters, Grid-interactive converter, Solid state transformers, PWM techniques, Converter topologies, Electrical machines, WBG device-based power converters, Electric vehicle, electric vehicle battery chargers, Renewable integration, AC/DC microgrids, Power quality improvement techniques, Hybrid energy systems, HVDC & FACTS etc.

- **Machine Design/ Power system dynamics and stability/ Power System analysis, optimization and control/ Power System Protection/ Utilization of Electrical Power**

Research activities in this area includes Power systems analysis, optimization and control, Distribution system automation, Demand side management, Impact of electrical vehicles in power system, Handling uncertainties in power system, Power generation, Energy systems, Energy audit and energy conservation, Renewable energy systems, Small scale energy generation in distribution system, Utility interfaces for renewable generation, Micro grid and Smart grid, Machine design and control, Power quality issues.

- **Smart grid/net zero energy buildings/ Transducers & Measurement /Advanced distribution system**

Research areas include advanced metering infrastructure, phasor measurement units, smart metering, Data Analytics for the Smart Grid, wide area monitoring system, smart grid communication Technologies, distribution automation, Peer-to-Peer Trading in Electricity Networks, transactive energy systems, Cyber-Physical Power System, smart building energy systems, renewable energy integrated buildings and storage, home energy management system, smart EV charging, demand side management, demand response, electricity markets, Wholesale and Distributed Energy Markets, virtual power plants, Electricity Consumer Characteristics Identification, application of ML, IoT and blockchain for smart grid development, transducers and measurement.

- **Artificial Intelligence/Control System/ Intelligent Control/ Robotics**

Distributed control and dynamical Systems, Robotics dynamic and control, sensory fusion, distributed artificial intelligence, hybrid systems, embedded systems, motion planning of robots and mechanisms, computer vision, machine learning, human-machine interaction, SLAM, Autonomous navigation, multi-modal optimization, sensors and actuators, human-centered control, man-machine systems, systems measurement & control, Artificial Intelligence.

3.1 Tentative Seats:

For the Session 2022-2023 (Even Sem) the maximum number of seats in the Department of EE are limited to

(i) Total Vacancies in the Department : 07

University reserves the right to change the number of seats.

The table below indicates the maximum number of vacancies available in various areas of research. However, the total numbers of seats are as given above

S. No.	Area of Research	Faculty	Ph.D. Thesis Completed	Total no. of Vacancies

1.	Renewable Energy/ Power Electronics/Hybrid Energy System/ Power Systems/ Power Quality/Electrical Drives	Prof. Asha Rani	08	-
		Prof. Prerna Gaur	12	02
		Dr. Ankit Kumar Singh	-	-
2.	Machine Design/Power system dynamics and stability/ Power System analysis, optimization and control/ Power System Protection/ Utilization of Electrical Power	Dr. Arjun Tyagi	-	01
		Dr. V S K V Harish	-	--
3.	Smart grid/ net zero energy buildings/ Transducers & Measurement / Advanced distribution system	Dr. Arjun Tyagi	-	-
		Dr. Ankit Kumar Singh	-	-
		Dr. Ravinder Singh	-	01
		Dr. VSKV Harish	-	-
4.	Artificial Intelligence/Control	Prof. Asha Rani	08	01

	system/ Intelligent Control/ Robotics	Prof. Prerna Gaur	12	01
		Dr. Ravinder Singh	-	01

The Vacancies and Supervision under a faculty is counted only once and in any one of the research fields available.

4. Faculty Profile

4.1 Prof. Asha Rani

1. Designation, Qualifications: Professor & Head of the Department, Ph.D.
2. Areas of Interest: Renewable Energy, Intelligent Control, Adaptive Control, Soft-computing based Adaptive Control, Biomedical Signal Processing, Robotic manipulator
3. E-mail: asha.rani@nsut.ac.in
4. Phone: 9953681254
5. Home Page: <http://www.nsut.ac.in>
6. Selected publication:
 - a. S Goyal, V Singh, A Rani, N Yadav, Multimodal image fusion and denoising in NSCT domain using CNN and FOTGV, Biomedical Signal Processing and Control 71, 103214, 2022 (IF 3.88)
 - b. B Panjwani, V Singh, A Rani, V Mohan, Optimum multi-drug regime for compartment model of tumour: cell-cycle-specific dynamics in the presence of resistance, Journal of Pharmacokinetics and Pharmacodynamics, 1-20, 2021(IF 2.745).
 - c. A Prabha, J Yadav, A Rani, V Singh, Design of intelligent diabetes mellitus detection system using hybrid feature selection based XGBoost classifier, Computers in Biology and Medicine 136, 104664, 2021 (IF 4.589)



- d. A novel nature-inspired algorithm for optimization: Squirrel search algorithm, M Jain, V Singh, A Rani, Swarm and Evolutionary Computation 44, 148-175, 2019 (IF 7.177).
7. Bio-Sketch: Asha Rani received her B.Tech. in Electrical Engineering from Regional Engineering College (Now NIT), Hamirpur, Himachal Pradesh in 1998. She received M.E. degree in Electrical Engineering from IIT Roorkee in 2000 and Ph.D in 2013 from University of Delhi, Delhi. She joined as lecturer in Instrumentation and Control Engineering Division at Netaji Subhas University of Technology, New Delhi in 2001 and currently she is a Professor in the organisation. She has published many papers in international journals and conferences. More than 28 M.Tech. and 7 Ph.D. thesis are completed under her guidance. Currently 3 Ph.D. students are working under her supervision. Her areas of research are Renewable Energy, Intelligent Control, Adaptive Control, Softcomputing based Adaptive Control, Biomedical Signal Processing and Robotic manipulator. She is the senior member of IEEE and IETE. She has chaired many conference sessions and has delivered expert lectures in short term courses at different colleges.

4.2 Prof. Prerna Gaur

1. Designation, Qualifications: Professor & Director, West Campus, NSUT, Ph.D.
2. Areas of Interest: Renewable Energy, Power Electronics, Power Quality, Artificial Intelligent based Control, Electrical Drive
3. E-mail: prernagaur@yahoo.com, prernagaur@nsut.ac.in
4. Phone: +91-9205475063 (O)
5. Home Page: <http://www.nsut.ac.in>
6. Latest Publication:
 - a. Gautam Sagar, Diwakar Pathak, **Prerna Gaur**, Vatsal Jain, "A Su Do Ku puzzle based shade dispersion for maximum power enhancement of partially shaded hybrid bridge-link-total-cross-tied PV array," **Journal of Solar Energy**, ELSVIER, Vol. 204, , Pages 161-180, 1 July 2020. Impact Factor 4.674



- b. Richa Sharma, Prerna Gaur, Shaurya Bhatt, Deepak Joshi, "Performance assessment of fuzzy logic control approach for MR damper based-transfemoral prosthetic leg" accepted in *IEEE Transactions on Artificial Intelligence*, August 2021 **DOI: [10.1109/TAI.2021.3106884](https://doi.org/10.1109/TAI.2021.3106884)**.
- c. R. Rana, V. Agarwal, P. Gaur and H. Parthasarathy, "Design of Optimal UKF State Observer–Controller for Stochastic Dynamical Systems," *IEEE Transactions on Industry Applications*, vol. 57, no. 2, pp. 1840-1859, March-April, (2021). doi:10.1109/TIA.2020.3048647, (SCIE).
7. **Bio-Sketch:**B.Tech in Electrical Engineering (1988), M.Tech (1996) and Ph.D. (2009) in the field of Artificial Intelligence and control. Presently, Director, NSUT, East Campus NSUT. Professor & founder Head in Instrumentation and Control and Electrical Engineering Department in NSUT (2018-2020). Six years of Industry experience and 26 years of Teaching experience in Delhi College Engineering and NSUT, Delhi. More Than 150 research papers in International journals and IEEE Conferences. Guided B.Tech, M.Tech and Ph.D. students. She is Director & Member Secretary, Technical Business Incubator of NSUT and NBA Coordinator of NSUT. Member of various committees of AICTE, NBA and UGC. She has organized IEEE international conference IICPE-2010 and INDICON2020 at NSUT and many faculty development Programs in 2003, 2018 and 2020. She is actively associated with IEEE (Senior Member), ISTE (Life Member), IETE Fellow and IE (Fellow). Treasurer, IEEE India Council from Jan 2021. Chair, IEEE Delhi Section (2019-20), Executive Vice Chair (2017-18), Secretary (2013-2016), Treasurer (2011-2012) and Jt. Secretary, (2008-2009), Served as Chairperson, IEEE Women in Engineering (2013-14), and Secretary, IEEE Women in Engineering, (2008-09) and (2012-13), Served as Chairperson PELS-IES Delhi Chapter, IEEE Delhi Section (2013-14) and Secretary PELS-IES Delhi Chapter, IEEE Delhi Section (2012-13), Vice Chairman –IEEE India Council, Student Activity in 2012. Served as Chairperson Membership Dev. Committee, IEEE Delhi Section (2008-10), Chair, Standing Committee, Student and Technical activities (2006-08) and (2011-14). Branch Counselor, IEEE NSUT Student Branch from Jan 2001 till date, Reviewer in IEEE International Journal of Power Electronics, Solar Energy and IEI journals.

She has won many awards. Winner of the 2021 Outstanding Branch Counselor & Branch Chapter Advisor Award from IEEE Member and Geographic Activities, USA 2021. Outstanding Volunteer Award, from IEEE India Council, 2019, Best Paper Award in ICETEMS-2021, Best paper award in ICST-2019, for paper presented in the conference. The award of Women of the Decade in Academia, presented at Women Economic Forum 2018, 26th April-1st May, New Delhi. Maulana Abul Kalam Azad Excellence award in Education-2015. IEEE PES Outstanding Chapter Engineer Award for 2015 from IEEE Delhi Section, Best Paper Award on the paper in the IEEE international conference INDICON-2015 17th – 20th Dec 2015, Best Paper Award on the paper in the IEEE international conference ICACEA-2015 19th – 20th March 2015, Outstanding Chapter award from IEEE PELS, NJ, USA in the year 2013 as Chairperson, PELS-IES Delhi Chapter, Outstanding Branch Counselor Award from Region 10 (Asia Pacific Region) in 2012 and from IEEE USA in 2009.

4.3 Dr. Arjun Tyagi

1. Designation, Qualifications: Assistant Professor, Ph.D.
2. Areas of Interest: Power system analysis, operation and optimization; Renewable power generation; Electric vehicles; Demand side management.
3. E-mail: arjun.tyagi@nsut.ac.in
4. Phone: 7503502155
5. Home Page: <http://www.nsut.ac.in>
6. Latest Publications in Peer Reviewed Journals:



- a. U. Maqbool, **Arjun Tyagi***, V. V. Tyagi and R. Kothari, “Optimization of the renewable-energy-based micro-grid for rural electrification in northern region of India,” *Clean Technologies and Environmental Policy*, (Springer Nature 2020), vol. 22, pp. 579–590, January 2020.
- b. Arjun Tyagi, K. Kumar, R. Krishan, S. J Singh and M. Sardhalia, “Optimal Allocation Provision for EV Charging Stations in the Low Voltage Distribution System,” *International Journal of Electrical Engineering and Technology*, vol. 12, no. 2, pp. 42-49, February 2021.
- c. Arjun Tyagi, K. Kumar, M. A. Ansari and B. Kumar, “An Efficient Load Flow Solution for Distribution System with Addition Distributed Generation,” *Journal of Electrical Systems and Information Technology*, (Springer Nature), vol. 7, no. 7, pp. 1-16, April 2020.

- d. Arjun Tyagi, K. Kumar, Kamaldeep, N. Tyagi and V. Rana, “Distribution Network Reconfiguration under Uncertainties in Load and Renewable Generation Forecast,” *International Journal of Scientific & Technology Research*, vol. 09, no. 4, pp. 423-427, April 2020.
 - e. V. Rana, M. A. Ansari, Y. K. Chauhan, **Arjun Tyagi** and K. Kumar, “A Novel Scheme of Parameters Control of Microturbine System at Different Loading Conditions,” *Taylor & Francis Journal of Information and Optimization Sciences*, vol. 41, no. 1, pp. 293-303, February 2020.
7. Bio-Sketch:Dr. Arjun Tyagi is an Assistant Professor in the Department of Electrical Engineering, NSUT Delhi. He has completed his B. Tech. in Electrical and Electronics Engineering with Honours and M. Tech. degree in Power System with Gold Medal and completed Ph. D. degree from Indian Institute of Technology (IIT) Delhi. He has published several research papers in leading international journals and presented his research work in many international conferences including India and overseas. His research interest includes modern electric power distribution system analysis, operation and optimization; Modelling, optimization and handling uncertainties in power system; Distributed renewable power generation; Electric vehicles; Demand side management.

4.4 Dr. Ravinder Singh

1. Designation, Qualifications: Assistant Professor, Ph.D.
2. Areas of Interest: Autonomous Mobile Robot, SLAM, 2D/3D LiDAR mapping, Trajectory planning techniques, Visual navigation system, robot control and optimization.
3. E-mail: ravinder.singh@nsuit.ac.in
engg.ravindersingh@yahoo.com
4. Phone:+919780232408
5. Home Page: <http://www.nsut.ac.in>
6. Latest Publications:



- a. Singh, R. and Nagla, K.S. (2019), “Removal of specular reflection and cross talk in sonar for precise and accurate range measurements”, MAPAN, Springer, Vol. 34 No. 1, pp. 31–42. <https://doi.org/10.1007/s12647-018-0282-4>(**SCI Index**)
- b. Singh, R. and Nagla, K.S. (2019), “Sonar sensor model for the precision measurement to generate robust occupancy grid map”, MAPAN,

- Springer, Vol. 34 No. 2, pp. 239–257. <https://doi.org/10.1007/s12647-018-0289-x>(**SCI Index**)
- c. Singh, R. and Nagla, K.S. (2019), “Comparative analysis of range sensors for the robust autonomous navigation—a review”, *Sensor Review*, Emerald Publishing Limited, Vol. 40 No. 1, pp. 17-41. <https://doi.org/10.1108/SR-01-2019-0029>(**SCI Index**)
 - d. Singh, R. and Nagla, K.S. (2019), “A modified sensor fusion framework for quantifying and removing the effect of harsh environmental condition for reliable mobile robot mapping”, *Sensor Review*, Emerald Publishing Limited. Vol. 39 No. 4, pp. 456-472. <https://doi.org/10.1108/SR-10-2018-0272>(**SCI Index**)
 - e. Singh, R., Khurana, A. and Kumar, S. (2020), “Optimized 3D laser point cloud reconstruction by gradient descent technique”, *Industrial Robot*, Vol. 47 No. 3, pp. 409-421. <https://doi.org/10.1108/IR-12-2019-0244>(**SCI Index**)
7. Bio-Sketch: Dr. Ravinder Singh earned his B.Tech in Electrical and Electronics Engineering from Punjab Technical University, Jalandhar (Punjab) followed by M.Tech in Instrumentation and Control Engg from National Institute of Technology, Jalandhar. He had also completed his PhD with specialization in robotics and control in the department of Instrumentation and Control from National Institute of Technology, Jalandhar. He had published more than 15 research articles in SCI and Scopus index journals. His current area of research is broadly focused on Unmanned Ground Vehicles, Path planning techniques, 2D/3D LiDAR mapping, Visual navigation system, robotic control and trajectory optimization, etc.

4.5 Dr. V. S. K. V. Harish

1. Designation, Qualifications: Assistant Professor, Ph.D.
2. Areas of Interest: Building Energy systems, Power Systems analysis.
3. E-mail: vskv.harish@nsut.ac.in; vskvharish@ieee.org
4. Phone: +91-8979552840 (M)
5. Home Page: <http://www.nsit.ac.in/division/ice/>
6. Latest Publications:

- a. Kishore, T. S., Patro, E. R., **Harish, V. S. K. V.**, and Haghghi, A. T., 2021. A Comprehensive Study on the Recent Progress and Trends in Development of Small Hydropower Projects. *Energies*, 14(10), pp. 2882, I.F.: 2.702, <https://doi.org/10.3390/en14102882>.



- b. **Harish, V.S.K.V.**; Kumar, A; “A review on modeling and simulation of building energy systems,” *Renewable and Sustainable Energy Reviews*, 56, pp. 1272-1292, ISSN 1364-0321, April 2016, I.F.: 12.110, <https://doi.org/10.1016/j.rser.2015.12.040>.
- c. **Harish, V.S.K.V.**; Kumar, A; “Reduced order modeling and parameter identification of a building energy system model through an optimization routine,” *Applied Energy*, 162, pp. 1010-1023, ISSN 0306-2619, Jan 2016, I.F.: 8.848, <https://doi.org/10.1016/j.apenergy.2015.10.137>.
7. Bio-Sketch: Dr. V.S.K.V. Harish received his B. E. in Electrical and Electronics Engineering from MaharshiDayanand University, Rohtak in 2009. He had completed his M.E. (with university medal) in Power Engineering from Jadavpur University, Kolkata in 2012 and Ph.D. from the Indian Institute of Technology Roorkee in Feb 2017; both with MHRD fellowship. After his PhD, he worked as a Post-Doctoral Fellow at TERI School of Advanced Studies, New Delhi under Netherlands’ government sponsored project on Smart grids for rural India. He has been nominated for the prestigious Young Energy Researcher Award in 2016 and in 2018 at World Sustainable Energy days, Austria. He has been awarded Best paper Awards at Springer and IEEE International conferences, in Nov 2018, Oct 2019, and Aug, 2020. He was granted international travel support by Department of Science and Technology, Govt. of India in 2014 and 2018 and by Soft Computing Research Society, India in 2017. He has published research papers in journals and conferences of international repute. He has published book chapters with CRC Press/Taylor & Francis and Springer. He has supervised two-M. Tech dissertations and has one Ph.D. scholar working on smart grids under his guidance. He is also member in several societies such as ASHARE, IEEE, SCRS, CIBSE, etc. His research interests include Building Energy systems and Power Systems analysis. (ORCID: 0000-0002-3033-690X).

4.6 Dr. Ankit Kumar Singh

1. Designation, Qualifications: Assistant Professor, Ph.D.
2. Areas of Interest: Electric Vehicle Charging System and Bidirectional DC-DC Converter.
3. E-mail: ankitee04@gmail.com
4. Phone: 8126905637
5. Home Page: <http://www.nsut.ac.in>



6. Latest Publications:

- a. **Ankit Kumar Singh**, Anjaneer Kumar Mishra, Krishna Kumar Gupta, Pallavee Bhatnagar, Taehyung Kim: An Integrated Converter With Reduced Components for Electric Vehicles Utilizing Solar and Grid Power Sources, *IEEE Transaction on Transportation Electrification*, vol. 6, no. 2, pp. 439 - 452, 2020.
 - b. **Ankit Kumar Singh**, Manoj Badoni and Yogesh Tatte: A Multifunctional Solar PV and Grid Based On-Board Converter for Electric Vehicles, *IEEE Transaction on Vehicular Technology*, vol. 69, no. 4, pp. 3717 - 3727, 2020.
 - c. **Ankit Kumar Singh**, Anjaneer Kumar Mishra, Krishna Kumar Gupta and Taehyung Kim: A Comprehensive Review of Non-isolated Bridgeless Power Factor Converter Topologies, *IET Circuit Devices and Systems* vol. 15, no. 3, pp. 197-208 - 3727, 2021.
 - d. Manoj Badoni, Alka Singh, **Ankit Kumar Singh**, Hemant Saxena, Rajeev Kumar: Grid Tied Solar PV System with Power Quality Enhancement Using Adaptive Generalized Maximum Versoria Criterion, *CSEE Journal of Power and Energy Systems (Accepted on 03/02/2021)*
 - e. Yogesh Tatte, Mohan Aware and **Ankit Kumar Singh**: The Performance Improvement of Direct Torque Controlled Five-Phase Induction Motor in Context of Common-Mode Voltage, Torque Ripple and Demagnetization under Low Speed Region, *IET Power Electronics*, vol. 13, no. 4, pp. 649 - 647, 2020.
7. Bio-Sketch: Ankit Kumar Singh received her B.Tech degree in Electrical and Electronics Engineering Uttar Pradesh Technical University, Lucknow, India, in 2008, the M.Tech. degree from the National Institute of Technology (NIT), Hamirpur, India, in 2013, and the Ph.D. degree from IIT Roorkee, Roorkee, India, in 2018. He was a Lecturer with the Electrical Engineering Department, Babu Banarasi Das National Institute of Technology & Management, Lucknow, from February 2009 to July 2011 and worked as Assistant Professor in the Department of Electrical and Instrumentation Engineering at Thapar Institute of Engineering and Technology Patiala from July 2018 to June 2021. Currently, he is working as an Assistant Professor in Department of Electrical Engineering at Netaji Subhas University of Technology, Dwarka, New Delhi. He has published many papers in international journals and conferences. His research interests include Electric Vehicle Charging System, Bidirectional DC-DC Converters, and Renewable Energy Systems.

4.7 Prof. T N Shukla

1. Designation, Qualifications: Professor Emeritus, Ph.D.
2. Areas of Interest: AI application in power system (planning and operation of Distribution system), Electrical Machines, Network Theory: Analysis and Synthesis.
3. E-mail: tns.shukla@gmail.com
4. Phone: 9811984397
5. Home Page: <http://www.nsut.ac.in>
6. Latest Publications:



- a) A K Gautam, S P Singh, J P Pandey, T N Shukla, "Performance Investigation of Permanent Magnet Synchronous Motor (PMSM) Drive Supplied from Hybrid Sources", International Conference on Emerging Trends in Electrical, Electronics and Sustainable Energy Systems, KNIT Sultanpur (ICETEES-16), 11-12 March 2016.
- b) Ravi Prakash Vishvakarma, S.P. Singh, T.N. Shukla, "Multilevel inverters and its control strategies: A comprehensive review". *IJMSE* Vol. 3, No. 2, July-December 2012, pp. 215-234.
- c) T. N. Shukla, S. P. Singh, V. Srinivasarao, K. B. Naik, "Optimal Sizing of Distributed Generation Placed on Radial Distribution Systems", *International Journal of Electric Power Components and Systems*, Vol. 38, pp. 260-274, 2010.
- d) T. N. Shukla, S. P. Singh, V. Srinivasarao, K. B. Naik, "Optimal Sizing of Distributed Generation Placed on Radial Distribution Systems", *International Journal of Electric Power Components and Systems*, Vol. 38, pp. 260-274, 2010.

7. Bio-Sketch: Dr. T. N. Shukla received *B. E.* (1976) and *M. E.* (1981) in Electrical Engineering from Motilal Nehru Regional Engineering College Allahabad affiliated with Allahabad University. *Ph. D.* in Electrical Engineering from Gautam Buddha (Uttar Pradesh) Technical University, Lucknow. He has 34 years of illustrious career at Kamla Nehru Institute of Technology Sultanpur (an Autonomous state government Engineering institution of U.P., India) as Lecturer (1982), Assistant Professor (1986) and then Professor (1996 onwards). He has guided more than 25 M. Tech. Dissertations and 50 B. Tech. Projects. In addition to the academic

responsibilities, he also served the institute in various administrative capacities. Besides, an expert member with national and state level organizations such as National Board of Accreditation, New Delhi, he has inspected around 30 Institutions and All India Council for Technical Education (AICTE).

Research Scholars:

S.N.	Name of Research Scholar	Supervisor
1.	Kundan Anand	Prof. A.P. Mittal
2.	Richa Sahu	Prof. Smriti Srivastava
3.	Tushar Sharma	Prof. Perna Gaur
4.	Rahul Gupta	Prof. S.K. Jha
5.	Praveen Kumar	Prof. S.K. Jha
6.	Kalyan Pal	Dr. V.S.K.V Harish
7.	Deepti Singh	Dr. Ankit Kumar Singh
8.	Avinash Gaurav	Dr. Arjun Tyagi
9.	PVV Pawan Kumar	Dr. V.S.K.V Harish
10.	Priyanka Upadhyay	Dr. Ravinder Singh Prof. Asha Rani
11.	Prabhat Srivastava	Prof. Perna Gaur Dr. Alok Agrawal

5. LABORATORY INFRASTRUCTURE

Each state-of-the-art laboratory is managed by a Faculty-In-Charge and a staff-in-charge and has the best-of-breed equipments.

1. Electrical Machines Lab-I & II

Electrical Machine-I laboratory is an important laboratory for the Electrical Department that provides support to the students to strengthen the fundamentals of machines. This laboratory not only gratifies the undergraduate students to understand the basic machinery but also provides the foundation to adapt for the advanced concept of the machines. The experiments such as DC motor speed control, construction features of DC motor, to understand the principle of operation of transformer, Short circuit and open circuit testing of transformer, etc. are performed. Electrical Machine Lab-1 is furnished with the following equipments:

- Direct Current Machines
- Single Phase Alternating Machine
- Single Phase Transformer
- Three Phase Transformer
- 1 Phase, 600 W Induction motor with 600 W DC shunt Generator
- 1 kW DC shunt motor with 1 kW Shunt Generator
- 250 W AC Series motor with 125 W DC Shunt generator
- 1 HP Brushless DC motor with 700 W Shunt motor
- 1 HP DC Shunt Motor
- Shunt Generator

Electrical Machine-II provides both the fundamental and advanced information regarding the AC machine. This laboratory not only makes the student familiar with the AC machines but also provides the technical knowledge regarding the analysis of special machines. Electrical Machine-II laboratory is primarily focusing on the three phase machines to understand the various technical concepts of rotating fields and also analyzing the performance characteristics of the three phase machines. Electrical Machine laboratory- II is essential to study and perform various experimental studies and analysis of the three phase electrical machines such as torque slip characteristics of AC machines, load analysis and fault analysis of three phase induction motors, constructional features of three phase induction motor, synchronous motor and three phase alternators. The laboratory is furnished with both the conventional and the advanced equipments as stated below:

- 3 Phase, 3kVA Alternator with 3.5 kW Shunt motor
- 3.5HP Compound Generator with 5 HP Shunt Motor
- 1HP Brushless DC motor with 700 W Shunt motor

- 3 Phase, 5HP Slip-ring Induction Motor with 3Hp DC compound generator
- 3 Phase, 1 HP Slip-ring Induction Motor with 1 kW DC Shunt generator
- Phase, 1 kW Squirrel Cage motor with 1 kW DC Shunt generator
- 3 Phase, 1 kW Synchronous motor with 1 kW DC Shunt motor
- 1 kW DC Short shunt Compound Motor with 1 kW DC Shunt Generator



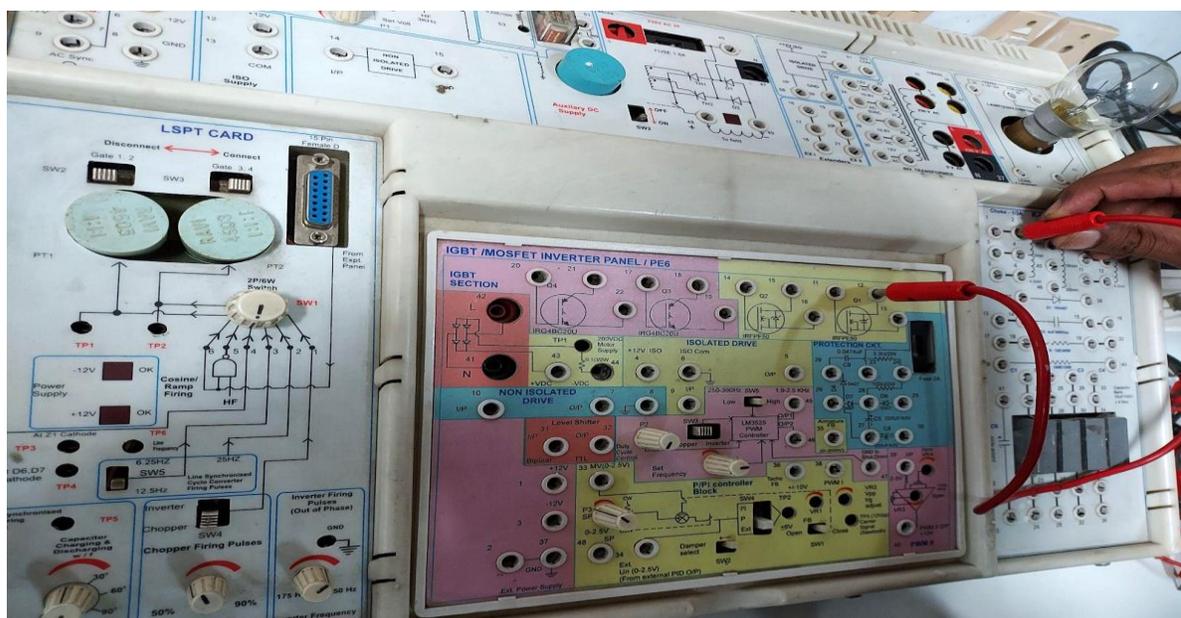


2. Power Electronics Lab

The aim of the power electronics lab is to impart practical knowledge of Power Electronics to the students at B.Tech and M.Tech levels. It is accordingly well equipped with equipment and trainer kits to teach practical from fundamentals to high level concepts to the students. Learn the characteristics of different types of power electronic devices, understand and analyze the operation of AC-DC converters, DC-DC converters, AC-AC converters & DC-AC converters. To Study Buck-Boost Converter with different filter components and loads.

Facilities available:

1. **Software** :PSPICE, Multisim, MATLAB
2. **Hardware**: Microlab Box, dSPACE-1104, POWER ELECTRONICS TRAINER KITS, Power Supplies, Function Generators, CRO, 3-Phase Power Analyzer, 1-phase Power Analyzer, Digital Multimeter, Projectors, fast speed Internet connection and latest configuration of PCs, Hybrid Energy.



3. Power Systems Lab

The purpose of the Power System Laboratory is for students to more closely follow the practices of power system engineering in the completion of their Power transmission and distribution, and Power system analysis. The laboratory curriculum provides hands-on practice on different modules of power system engineering and encourages the students to take a sustained approach. The Laboratory curriculum includes the following facilities:

- Determination of ABCD parameters of a transmission line.
- Verification of Ferranti Effect in transmission line.
- PV characteristics of transmission line.
- Comparison of radial and ring main distribution systems.
- Simulation study of string insulator with and without guard ring and find string efficiency.
- Study and measurement of capacitance of three core cable.
- Determination of voltage drop in cable.
- Testing dielectric strength of transformer oil.
- To study fault location of underground cables.

4. Switchgear and Protection Lab

This Laboratory familiarizes the students with the most fascinating subject of power engineering students i.e. Switchgear and protection, and Advanced power system protection & switchgear. The laboratory provides hands-on practice on various switchgear equipment used for power system protection and makes students familiarize with the performance of these equipment. This laboratory mainly focuses on the introduction and verification of various protective tools/devices such as different relays, protection of generators, transformers and transmission lines.

5. Power Systems Simulation Lab

Power system analysis involves developing computerized simulation models of the electrical power system. It enables the students to understand the basic tools and techniques for analyzing the operation of power systems in normal as well as during contingencies. Modeling and simulations are performed to verify that the electrical system, including the system components, are correctly specified to perform as intended, withstand expected stress and be protected against failures. Power system analysis includes:

- Transmission line modelling and performance analysis
- Synchronous machine representation
- Power flow analysis
- Symmetrical and asymmetrical fault analysis
- Stability analysis
- Harmonic analysis
- Dynamic and transient analysis

6. High Voltage DC Lab:

A high-voltage, direct current (HVDC) electric power transmission system (also called a power superhighway or an electrical superhighway) uses direct current for the bulk transmission of electrical power, in contrast with the more common alternating current (AC) systems. For long-distance transmission, HVDC systems may be less expensive and suffer lower electrical losses. The aim of the HVDC simulation laboratory is to provide in depth study of HVDC converters and reactive power control techniques.

7. Renewable Energy Sources Lab:

The aim of the Renewable Energy Sources lab is to familiarize the students with the various renewable energy sources, and help them to understand the operating characteristics under variable test conditions. The students will be

able to develop the simulation models for renewable energy based systems and will be able to test and validate the developed model in real-time scenarios. The students will be able to learn the system modelling, simulation and will have hands-on experience for their real-time validation. At present, this lab is under development phase and following major components/instruments are planned for exploiting, testing and validating the renewable energy based systems:

- Various softwares for performing the system modelling and numerical simulations
 - Simulation-in-the-loop set-ups
 - Real-time simulator
 - DC microgrid
 - Wind energy emulator
 - Fuel cell set-up

6. ELIGIBILITY WITH RESPECT TO BACHELORS & MASTERS DEGREE.

List of Degrees in B. Tech. / B.E./B.Sc. Engg. Considered for admission

1. Electrical Engineering/ Electronics & Electrical Engineering/ Instrumentation & Control Engineering/ Instrumentation/ Electronics and Instrumentation Engineering/ Applied Electronics and Instrumentation Engineering or equivalent.

With M. Tech specialization in any of the branches mentioned in Table below.

S.No.	Name of the Course
1.	Advanced Electrical Power System
2.	Applied instrumentation
3.	Artificial intelligence
4.	Automation and Control Power Systems
5.	Automation and Robotics
6.	Automobile Engineering
7.	Control and Instrument
8.	Control and Instrumentation
9.	Electric Power System
10.	Electrical and Electronics (Power System)
11.	Electrical and Electronics Engineering

12.	Electrical and Mechanical Engineering
13.	Electrical and Power Engineering
14.	Electrical Devices and Power Systems
15.	Electrical Drives and Control
16.	Electrical Energy Systems
17.	Electrical Engineering
18.	Electrical Engineering (Electronics and Power)
19.	Electrical Engineering (Instrumentation and Control)
20.	Electrical instrumentation and Control Engineering
21.	Electrical Machines
22.	Electrical Machines and Drives
23.	Electrical Power Engineering
24.	Electrical Power System
25.	Energy and Environmental Management
26.	Energy Engineering
27.	Energy Management
28.	Energy Science and Technology
29.	Energy Systems
30.	Energy Systems Analysis and Design
31.	Energy Systems and Management
32.	Energy Systems Engineering
33.	Energy Technology
34.	Energy Technology and Management
35.	High Voltage and Power Systems Engineering
36.	High Voltage Engineering
37.	Image Processing
38.	Industrial Automation and Robotics
39.	Industrial Drives and Control
40.	Industrial System and Drives
41.	Industrial Systems Engineering
42.	Instrumentation and Control (Applied Instrumentation)
43.	Instrumentation and Control Engineering
44.	Instrumentation and Electronics
45.	Instrumentation Engineering
46.	Instrumentation Technology

47.	Integrated Circuits Technology
48.	Integrated Power Systems
49.	Intelligent Systems
50.	Machine Design
51.	Machine Design and Robotics
52.	Measurement and Control
53.	Mechatronics
54.	Medical Electronics
55.	Modeling and Simulation
56.	Nano Science and Technology
57.	Nanotechnology
58.	Neural Networks
59.	Power and Energy Engineering
60.	Power and Energy System
61.	Power and Industrial Drives
62.	Power Control and Drives
63.	Power Electronics
64.	Power Electronics and Control
65.	Power Electronics and Drives
66.	Power Electronics and Drives in Electrical Engineering
67.	Power Electronics and Electrical Drives
68.	Power Electronics and Machine Drives/Power apparatus and systems
69.	Power Electronics and Power Systems
70.	Power Electronics and Systems
71.	Power Electronics Engineering
72.	Power Engineering
73.	Power Engineering and Energy Systems
74.	Power Plant Engineering and Energy Management
75.	Power System and Control
76.	Power System and Control Automation
77.	Power System Control and Automation
78.	Power System with Emphasis H. V. Engineering
79.	Power Systems
80.	Power Systems and Automation
81.	Power Systems and Power Electronics

82.	Power Systems and Renewable Energy
83.	Power Systems Control and Automation Engineering
84.	Power Systems Engineering
85.	Process Control
86.	Process Control instrumentation
87.	Process Dynamics and Control
88.	Process instrumentation
89.	Renewable Energy
90.	Robotics and Automation
91.	Robotics and Mechatronics
92.	Solar Power Systems
93.	Industrial Instrumentation and Control
94.	Industrial Power Control and Drives
95.	Power Apparatus and Systems.
96.	Digital Technology & Instrumentation Engineering
97.	Power Electronics electrical Machine & Drives Engineering
98.	Power Engineering

7. SYLLABUS FOR WRITTEN TEST:

The entrance test shall consist of 100 multiple choice questions. There shall be no negative marking. 50 questions shall be based on Research Aptitude/Methodology which shall include quantitative methods/computer applications, experimental techniques etc. and 50 questions shall be subject specific. The test shall be of TWO hours.

Part A Research Aptitude/Methodology: Common to all departments

Unit-1 Research Aptitude

- Research: Meaning, Types, and Characteristics, Positivism and Post-positivistic approach to research.
- Methods of Research: Experimental, Descriptive, Historical, Qualitative and Quantitative methods.
- Steps of Research.
- Thesis and Article writing: Format and styles of referencing.
- Application of ICT in research.
- Research ethics.

Unit-2 Comprehension & Communication

- A passage of text be given. Questions be asked from the passage to be answered.
- Communication: Meaning, types and characteristics of communication.
- Effective communication: Verbal and Non-verbal, Inter-Cultural and group communications, Classroom communication.
- Barriers to effective communication.
- Mass-Media and Society.

Unit-3 Mathematical Reasoning and Aptitude

- Types of reasoning.
- Number series, Letter series, Codes and Relationships.
- Mathematical Aptitude (Fraction, Time & Distance, Ratio, Proportion and Percentage, Profit and Loss, Interest and Discounting, Averages etc.) Unit-VI Logical Reasoning
- Understanding the structure of arguments: argument forms, structure of categorical propositions, Mood and Figure, Formal and Informal fallacies, Uses of language, Connotations and denotations of terms, Classical square of opposition.
- Evaluating and distinguishing deductive and inductive reasoning.
- Analogies.
- Venn diagram: Simple and multiple use for establishing validity of arguments.

Unit-4 Data Interpretation

- Sources, acquisition and classification of Data.
- Quantitative and Qualitative Data.
- Graphical representation (Bar-chart, Histograms, Pie-chart, Table-chart and Line-chart) and mapping of Data.
- Data Interpretation.
- Data and Governance.

Unit-5 Information and Communication Technology (ICT)

- ICT: General abbreviations and terminology.
- Basics of Internet, Intranet, E-mail, Audio and Video-conferencing.
- Digital initiatives in higher education.
- ICT and Governance.

NOTE: (i) Equal number of questions are to be set from each Unit.

(ii) Whenever graphical/pictorial question(s) are set for sighted candidates, a passage followed by equal number of questions and weightage be set for visually impaired candidates.

Part B: Department Specific Subject:

Electrical Engineering (EE)–

Section 1: Electric Circuits

Network graph, KCL, KVL, Node and Mesh analysis, Transient response of dc and ac networks, Sinusoidal steady-state analysis, Resonance, Passive filters, Ideal current and voltage sources, Thevenin's theorem, Norton's theorem, Superposition theorem, Maximum power transfer theorem, Two-port networks, Three phase circuits, Power and power factor in ac circuits.

Section 2: Electromagnetic Fields

Coulomb's Law, Electric Field Intensity, Electric Flux Density, Gauss's Law, Divergence, Electric field and potential due to point, line, plane and spherical charge distributions, Effect of dielectric medium, Capacitance of simple configurations, Biot-Savart's law, Ampere's law, Curl, Faraday's law, Lorentz force, Inductance, Magnetomotive force, Reluctance, Magnetic circuits, Self and Mutual inductance of simple configurations.

Section 3: Signals and Systems

Linear Algebra: Matrix Algebra, Systems of linear equations, Eigenvalues, Eigenvectors. Initial and boundary value problems, Partial Differential Equations, Method of separation of variables. Numerical Methods: Solutions of nonlinear algebraic equations, Single and Multistep methods for differential equations. Transform Theory: Fourier Transform, Laplace Transform, z-Transform, Application of differential equation and LT to circuit problem. Representation of continuous and discrete-time signals, Shifting and scaling operations, Linear Time Invariant and Causal systems, Fourier series representation of continuous periodic signals, Sampling theorem, Applications of Fourier Transform, Laplace Transform and z-Transform.

Section 4: Electrical Machines I

Single phase transformer: equivalent circuit, phasor diagram, open circuit and short circuit tests, regulation and efficiency; Three phase transformers: connections, parallel operation; Auto-transformer, Electromechanical energy conversion principles, DC machines: separately excited, series and shunt,

motoring and generating mode of operation and their characteristics, starting and speed control of dc motors.

Section 5: Electrical Machine II

Three phase induction motors: principle of operation, types, performance, torque-speed characteristics, no-load and blocked rotor tests, equivalent circuit, starting and speed control; Operating principle of single phase induction motors; Synchronous machines: cylindrical and salient pole machines, performance, regulation and parallel operation of generators, starting of synchronous motor, characteristics; Types of losses and efficiency calculations of electric machines.

Section 6: Power Systems

Power generation concepts, ac and dc transmission concepts, Models and performance of transmission lines and cables, Series and shunt compensation, Electric field distribution and insulators, Distribution systems, Perunit quantities, Bus admittance matrix, Gauss-Seidel and Newton-Raphson load flow methods, Voltage and Frequency control, Power factor correction, Symmetrical components, Symmetrical and unsymmetrical fault analysis, Principles of over-current, differential and distance protection; Circuit breakers, System stability concepts, Equal area criterion.

Section 7: Control Systems

Mathematical modeling and representation of systems, Feedback principle, transfer function, Block diagrams and Signal flow graphs, Transient and Steady-state analysis of linear time invariant systems, Routh-Hurwitz and Nyquist criteria, Bode plots, Root loci, Stability analysis, Lag, Lead and Lead-Lag compensators; P, PI and PID controllers; State space model, State transition matrix.

Section 8: Electrical and Electronic Measurements

Bridges and Potentiometers, Measurement of voltage, current, power, energy and power factor; Instrument transformers, Digital voltmeters and multimeters, Phase, Time and Frequency measurement; Oscilloscopes, Error analysis.

Section 9: Analog and Digital Electronics

Characteristics of diodes, BJT, MOSFET; Simple diode circuits: clipping, clamping, rectifiers; Amplifiers: Biasing, Equivalent circuit and Frequency response; Oscillators and Feedback amplifiers; Operational amplifiers:

Characteristics and applications; Simple active filters, VCOs and Timers, Combinational and Sequential logic circuits, Multiplexer, Demultiplexer, Schmitt trigger, Sample and hold circuits, A/D and D/A converters, 8085 Microprocessor: Architecture, Programming and Interfacing.

Section 10: Power Electronics

Characteristics of semiconductor power devices: Diode, Thyristor, Triac, GTO, MOSFET, IGBT; DC to DC conversion: Buck, Boost and Buck-Boost converters; Single and three phase configuration of uncontrolled rectifiers, Line commutated thyristor based converters, Bidirectional ac to dc voltage source converters, Issues of line current harmonics, Power factor, Distortion factor of ac to dc converters, Single phase and three phase inverters, Sinusoidal pulse width modulation.

6.3 FACULTY OF INTERDISCIPLINARY STUDIES.

6.3.1 DEPARTMENT OF BIOLOGICAL SCIENCES AND ENGINEERING

1. The Department

Biotechnology is set to revolutionize human life and the society. It is one among the dynamic areas of science and engineering that represents a synthesis of evolving technologies to propel industries towards sustainable development. Today, this growing discipline is poised on the interface of various subjects that contribute to the growth of pharmaceutical, agricultural, lifestyle and many other industries. The Department of Biological Sciences and Engineering (BSE) was conceived with the aim of creating well trained human resources to fulfill the growing demand in various sectors of Biotechnology. The Department boasts a strong profile of teaching and research with commitment towards excellence.

It is envisioned that the Department of BSE will engage in frontier areas of Biotechnology, such as, development of novel therapeutics, computational molecular biology, bioenergy and industrial enzymes. The Department currently has one emeritus Professor, two regular Professors and six Assistant Professors. Most of the faculty are doctoral degree holders and actively engaged in research. The department has attracted research funding from many external funding agencies due to its dynamic research profile. Both undergraduate and postgraduate students are actively

engaged in research projects under different faculty mentors, and have gone on to join prestigious institutions for higher studies in India and abroad. The Department is equipped with state of art laboratories and computer facility for projects and research work. Additional laboratories are proposed to be developed for the coming year.

2. Courses Offered

The Department of BSE was started during the academic session 2004-05. It presently offers a four year B.E. degree program in Biotechnology with intake of 60 students. Apart from this, M.Tech. degree programs in 1) Biochemical Engineering and 2) Bioinformatics have an intake of 18 students. Besides the UG and P.G. degree programs, a Ph.D. degree program is also run by the department. Additionally, M.Tech in Nanobiotechnology programs has already been approved by AICTE, and will be launched in successive years.

In order to keep pace with the current technological advancements, the UG curriculum has been recently modified and updated to allow students to stay abreast of latest happening as well as to cater to their specific interests for specialization through electives.

3. Areas of Research and available Vacancies

The faculty members are engaged in the various areas of research listed below:

- **Computational Biology & Bioinformatics** – The lab. uses techniques of Bioinformatics tools and databases, Machine learning, Network systems Biology, Genome analysis, Evolutionary analysis, Molecular modeling, Genomics, Proteomics and systems biology for drug design and development. The long-term goal includes study of molecular mechanisms of disease, selection of drug targets, drug design and repurposing in cardiovascular and infectious diseases.
- **Molecular Microbiology & Drug Discovery** - Discovery and characterization of novel drug candidates for treatment of infectious diseases and metabolic disorders from microbial and other natural sources. Antifungal and anti bacterial drug discovery, Regulation of secondary metabolite production, Expression and regulation of biosynthetic gene clusters in Actinobacteria. Our research endeavors have led to the discovery of 10 novel anti-Candida compounds and 02 novel antibacterial compounds from Streptomyces spp. and 03 novel anti-inflammatory molecules from Aegle marmelos and Coccus

nucifera. Our research interest further extends to understanding the molecular and cellular basis of antimicrobial action of the drugs.

- **Cell and Molecular Biology** - Recombinant Therapeutics, Cell-based Screening Assays, Cloning, expression and purification of antibodies, Programmed Cell Death, Innate Immunity and Alzheimer's Disease, Industrially Relevant Proteins/Enzymes, Diagnostics
- **Biochemical Engineering** - Biochemical and Bioprocess Engineering, Bioremediation of heavy metals and other pollutants, Advanced bioreactor development for wastewater treatment, Bioenergy, simulation and modeling of biological processes, food technology and algae-based technologies for renewable bioproducts.
- **Nanobiotechnology & Nanomedicine** - Developing nano-formulations of compounds with the aim of finding new potential therapeutics. Besides, nanotechnology-based drug delivery systems for novel therapeutics are also being explored to overcome challenges like poor bioavailability, in vivo stability, solubility, intestinal absorption and sustained and targeted delivery to site of action.
- **Cell Culture and Toxicoproteomics** - Development and characterization of cell lines, Cell based assays for toxicity evaluation of pollutants, and comparative proteomics for discovery of protein biomarkers
- **Infection and Immunity** - Development of DNA vaccines, studies on programmed cell death in prokaryotes and infectious disease systems like Mycobacterium, Brucella.
- **Production of Bioactive compounds** - Modelling Simulation & Optimization of bioprocesses, Scale-up, Production of therapeutic drugs by plant cell / hairy root cultivation, Development of novel reactor designs for enhanced production of bioactive compounds

3.1 Tentative Seats

For the Session 2022-2023 (Even Sem) the maximum number of seats in the Department of BSE are limited to:

- i. **Vacancies with university fellowship : 02**
- ii. **Vacancies without university fellowship : 05**

Sr. No.	Area of Research	Faculty	No. of candidates to be taken in coming session	

			With Univ. Fellowship	Without Univ. fellowship
1	Computational and structural Biology	Prof. Sonika Bhatnagar	01	01
2	Molecular Microbiology and Drug Discovery	Prof. Ashok Kr. Dubey	NIL	02
3	Nanobiotechnology and Nano medicine	Dr. Shilpa Sharma	NIL	01
4	Cell and Molecular Biology	Dr. Yatender Kumar	NIL	NIL
4	Plant Biotechnology Environmental Biotechnology	Dr. Akhilesh Dubey	01	01

4. Faculty Profile

4.1 Professor Sonika Bhatnagar

1. **Designation, Qualification:** Professor and Head, Ph.D.

2. **Area of Interest:** Application of Computational molecular biology, Bioinformatics, Network Biology, Molecular modeling and Structure based Drug design tools for development of novel therapeutics for Cardiovascular disease and for elucidation of bacterial stress response.



3. **Selected publications:**

- Singh N, Rai S, Bhatnagar R, Bhatnagar S. Network analysis of host-pathogen protein interactions in microbe induced cardiovascular diseases. In Silico Biol. 2021;14(3-4):115-133.
- Singh, N. and Bhatnagar, S. Machine Learning for Prediction of Drug Targets in Microbe Associated Cardiovascular Diseases by Incorporating Host-pathogen Interaction Network Parameters. Mol. Inf. 2021;2100115.

- Singh N, Bhatia V, Singh S, Bhatnagar S. MorCVD: A Unified Database for HostPathogen Protein-Protein Interactions of Cardiovascular Diseases Related to Microbes. *Sci Rep.* 2019 Mar 11;9(1):4039.
- Kandari D, Gopalani M, Gupta M, Joshi H, Bhatnagar S, Bhatnagar R. Identification, Functional Characterization, and Regulon Prediction of the Zinc Uptake Regulator (zur) of *Bacillus anthracis* - An Insight Into the Zinc Homeostasis of the Pathogen. *Front Microbiol.* 2019 Jan 11;9:3314.
- Rai S, Mohanty P, Bhatnagar S. Modeling, dynamics and phosphoinositide binding of the pleckstrin homology domain of two novel PLCs: $\eta 1$ and $\eta 2$. *J Mol Graph Model.* 2018 Oct; 85:130-144.
- Mohanty P, Bhatnagar S. Structure of focal adhesion kinase in healthy heart versus pathological cardiac hypertrophy: A modeling and simulation study. *J Mol Graph Model.* 2018 Mar; 80:15-24.
- Joon S, Gopalani M, Rahi A, Kulshreshtha P, Gogoi H, Bhatnagar S, et al. Biochemical characterization of the GTP-sensing protein, CodY of *Bacillus anthracis*. *Pathog Dis.* 2017 Jun 01;75(4).
- 4. **E-mail:** sbhatnagar@nsut.ac.in; ecc999@gmail.com
- 5. **Phone:** 01125000110
- 6. **Home page:** <http://www.nsit.ac.in/faculty/bt8/>
- 7. **Bio-sketch:**

Dr. Sonika Bhatnagar completed her Ph.D. and Post-Doctoral work in Department of Biophysics, AIIMS. She has been involved with the BSE Department since its inception. She has worked towards developing the curricula, laboratories and other infrastructure in the Department. She carried out an international consultancy assignment and was awarded the Innocentive solver award for selection of five top therapeutic targets for obesity in 2003. Her work lies in the area of systems biology and structural study of protein -protein interactions as novel drug targets using machine learning, and genomics & proteomics. Collaborative projects have also been established for molecular Biology, drug design & discovery for cardiovascular disease drug design and study of stress response in bacteria.

4.2 Professor Ashok K Dubey



1. **Designation, Qualification:** Professor, Ph.D.
2. **Areas of Interest :** Antifungal and antibacterial drug discovery, Mode and mechanism of actions of novel drugs, Expression and regulation of Biosynthetic Gene Clusters and Secondary Metabolite Production in Actinobacteria
3. **Selected Publications:**
 - Singh, R. and Dubey, A. K. (2020) Isolation and characterization of a new endophytic actinobacterium *Streptomyces californicus* strain ADR1 as a promising source of anti-bacterial, anti-biofilm and antioxidant metabolites. *Microorganisms* 8(6):929, DOI: 10.3390/microorganisms8060929
 - Singh, R. and Dubey, A. K. (2020) Differential synthesis of secondary metabolites by *Streptomyces chrestomyceticus* strain ADP4 in response to modulation in nitrogen source and its anti-Candida activity. *Proceedings* 2020, 66, 5; doi:10.3390/proceedings2020066005
 - Chaubey, A. and Dubey, A. K. (2020) Chemistry and antioxidant potential of phytoconstituents from *Aegle marmelos* fruit-shell. *Current Drug Metabolism*, 21(7): 525-533. DOI: 10.2174/13892002-21666200711161056
 - Singla, R. and Dubey, A. K. (2019) Phytochemical Profiling, GC-MS Analysis and α -Amylase Inhibitory Potential of Ethanolic Extract of *Cocos nucifera* Linn. Endocarp. *Endocrine, Metabolic & Immune Disorders - Drug Targets*, 19 (4), 419 – 442.
 - Srivastava, V., Singla, R. and Dubey, A. K. (2018) Inhibition of Biofilm and Virulence Factors of *Candida albicans* by Partially Purified Secondary Metabolites of *Streptomyces chrestomyceticus* Strain ADP4. *Curr. Topics Med. Chem.* 18, 925-945.
 - Singla, R. K., Ali, M, Kamal, M. A. and Dubey, A. K. (2018) Isolation and Characterization of Nuciferoic Acid, a Novel Keto Fatty Acid with Hyaluronidase Inhibitory Activity from *Cocos nucifera* Linn. Endocarp. *Curr. Topics Med. Chem.* 18, 2367 - 2378.
 - Srivastava, V., Singla, R. and Dubey, A. K. (2018) Emerging virulence, drug resistance and future anti-fungal drugs for *Candida* pathogens. *Curr. Topics Med. Chem.* 18, 759-778.
 - Singh R. and Dubey, A. K. (2018) Diversity and applications of endophytic actinobacteria of plants in Special and Other Ecological

Niches. Front. Microbiol. 9:1767. doi: 10.3389/fmicb.2018.01767

4. **E-mail:** adubey.nsit@gmail.com ; akdubey@nsut.ac.in

5. **Phone:** 9999277898

6. **Home page:** <http://www.nsit.ac.in/faculty/bt1/>

7. **Bio-Sketch:**

Dr. Ashok Dubey joined Netaji Subhas Institute of Technology during May 2001 as Professor of Biotechnology. He initiated and led the development and implementation of a four-year Degree Program in B. E. Biotechnology. He started and established the Division of Biotechnology at NSIT and has since been its founding Head until June 2018. Professor Dubey has earlier served as Assistant Professor at Indian Institute of Technology-Delhi following his Post-Doctoral stay with Nobel Laureate, Dr. R. J. Roberts at Cold Spring Harbor Laboratory, USA. Subsequently, he moved to the Biomolecular Research Institute/CSIRO Division of Health Sciences & Nutrition, Melbourne, Australia and continued there until his move to NSIT. His main research interests at NSIT include the discovery of anti-infective agents, novel therapeutics for inflammation, diabetes and cancer; along with further exploring the diversity and application of actinobacteria.

4.3 **Dr. Yatender Kumar**

1. **Designation, Qualification:** Assistant Professor, Ph.D.

2. **Areas of Interest:** Cell and Molecular Biology, Biochemical Engineering, Recombinant Therapeutics and Diagnostics.

3. **List of Publications:**

- a. Sharma A, Anand JS, **Kumar Y**. Immunotherapeutics for AD: A Work in Progress. **CNS Neurol Disord Drug Targets** 2021 Sep 2. doi: 10.2174/1871527320666210903101522
- b. Kailoo S, Shreya, **Kumar Y**. Cytolethal distending toxin: from genotoxin to a potential biomarker and anti-tumor target. **World J MicrobiolBiotechnol(2021) 37(9):150**.
- c. Gupta A, **Kumar Y**. Bispecific antibodies: a novel approach for targeting prominent biomarkers. **Hum VaccinImmunother. (2020) 16(11):2831-2839**.

4. **E-mail:**yatenderkumar@gmail.com; yatender.kumar@nsut.ac.in

5. **Phone:** +918285011981

6. **Home page:** <http://www.nsit.ac.in/faculty/bt6/>

7. **Bio-Sketch**

Dr. Yatender Kumar did his PhD from Centre for Cellular and Molecular Biology, Hyderabad in the year 2010 and post doc from Max-



Planck Unit for Structural and Molecular Biology, Hamburg and DZNE, Bonn, Germany where he received prestigious Max-Planck fellowship. Later, he joined Premas Biotech Pvt. Ltd., Gurgaon as Research Scientist. He has been working as Assistant Professor at Division of BSE, NSUT since 2014. He has received Early Career Research (ECR) Award by DST-SERB; Govt. of India. His research areas include Cell & Molecular Biology and Biochemical Engineering (Joint collaboration with Dr. Soumya Sasmal), Recombinant Therapeutics and Diagnostics.

4.4 Dr. Soumya Sasmal

1. **Designation, Qualification:** Assistant Professor, Ph.D.
2. **Areas of Interest:** Bioenergy, Biochemical Engineering, Food Engineering, Cellular and Molecular Biology
3. **List of Publications:**
 - a. Sasmal S, Goud VV, Mohanty K. Simultaneous ethanol and hydrogen production by fermentation from Bon bogori (*Ziziphus rugosa*). *Renewable Energy Focus*. 2018; 26: 71-80.
 - b. Mahto RB, Yadav M, Sasmal S. Optimization of process parameters for production of pectinase using *Bacillus Subtilis*. *Recent patents on biotechnology*; 2018: MF447840. 1.
 - c. Sasmal S, Goud VV, Mohanty K. Ultrasound assisted lime pretreatment of lignocellulosic biomass toward bioethanol production. *Energy & Fuels*. 2012; 26(6): 3777-3784.
4. **E-mail:** sasmal@nsut.ac.in
5. **Phone:** +918588898094
6. **Home page:** <http://www.nsit.ac.in/faculty/bt3/>
7. **Bio-Sketch**



Dr. Sasmal has published more than 10 research papers in reputed International Journals, Proceedings of International and National Conferences. His research interests are in the areas of Fermentation process, Bioenergy, Food engineering, Biochemical engineering, Metabolic engineering and Cellular Molecular Biology (Joint collaboration with Dr. Yatender Kumar)

4.5 Dr. Akhilesh Dubey

1. **Designation, Qualification:** Assistant Professor, Ph.D.

2. **Areas of Interest:** Hydroponics Technology, Plant Biotechnology, Environment Biotechnology

3. **List of Publications:**

- 1) LL Meena, M Goswami, A Chaudhari, NS Nagpure, P Gireesh-Babu, (2020) Development and characterization of a new DRCF cell line from Indian wild strain zebrafish *Danio rerio* (Hamilton 1822), *Fish Physiology and Biochemistry*, 1-11
- 2) Mukunda Goswami, Akhilesh Dubey, Kamalendra Yadav, Bhagwati S. Sharma and W S Lakra (2015) Identification of Fish Cell Lines Using 2-D Electrophoresis Based Protein Expression Signatures, 12(4): 245 – 252 DOI: 10.2174/157016461204160119161034
- 3) Akhilesh Dubey, M. Goswami, K. Yadav, D. Chaudhary (2015) Oxidative Stress and Nano-Toxicity Induced by TiO₂ and ZnO on WAG Cell Line. *Plos One*
- 4) M. Goswami, G. Hariprasad, A. Dubey, R. Kumar, N.S. Nagpure, A. Srinivasan, T.P. Singh and W.S. Lakra (2015) Proteomic Analysis of Liver Tissue of *Labeorohita*, *Current Proteomics*, vol 12
- 5) Akhilesh Dubey, Mukunda Goswami, Kamalendra Yadav, Bhagwati Sharan Sharma 2014 “Development and characterization of a cell line WAF from freshwater shark *Wallago attu*.” *Molecular Biology Reports* 41(2):915-924
- 6) Neeraj Mishra, Akhilesh Dubey, Rahul Mishra and Nabneeta Barik 2010 “Study on antioxidant activity of common dry fruits” *Food and Chemical Toxicology* 48, 3316-3320
- 7) N.S. Nagpure, A. Mishra, A. S. Ninawe, A. Rasal, A. Dubey, A Kumar, M Goswami, R. Kumar and J.K. Jena (2015) Development, Maintenance and Long-Term Storage of Fish Cell Lines for its Application in Fishery Biotechnology. *National Academy of Science Letters*. Article DOI: 10.1007/s40009-015-0365-5
- 8) Mukunda Goswami, Kamalendra Yadav, Akhilesh Dubey, Bhagwati Sharan Sharma, RiturajKonwar, Ravindra Kumar, NS Nagpure, Wazir S Lakra 2014 “In vitro cytotoxicity assessment of two heavy metal salts in a fish cell line (RF).” *Drug and Chemical Toxicology* 37(1):48-54



4. **Phone:** +91783888012

5. **E-mail:**akhilesh.dubey@nsut.ac.in

6. **Home page:** <http://www.nsit.ac.in/faculty/bt10/>

7. **Bio-Sketch**

Dr. Akhilesh Dubey has completed PhD in Biotechnology from Uttar Pradesh Technical University, Lucknow. He has an expertise in the area of Mammalian Cell line development and Plant Biotechnology. He was involved in DBT funded project on establishment of the “**National Repository of Fish Cell Lines**” at NBFGR, Lucknow. He has developed several new fish cell lines from freshwater and cold water fishes and has used them as an *in vitro* tool for toxicological evaluation of heavy metals, pesticides and nanoparticles. He has further worked on proteomic profiling of aquatic organisms. Earlier he had worked at Saroj Institute of Technology & Management, Lucknow (Affiliated from UPTU) as an Assistant Professor. Presently, he is working on Hydroponics Technology for sustainable environment to ensure food security for rising population and combat climate change. The focus area of research is to treat waste-water and restore the health of water bodies using hydroponics technology while conserving endangered and medicinal plants.

4.6 Dr. Shilpa Sharma

1. **Designation, Qualification:** Assistant Professor, Ph.D.

2. **Areas of Interest:** Nanobiotechnology, Biofuel and Catalysis, Environment Biotechnology

3. **List of Publications:**

a. Dadwal A., Singh V., Sharma S., Satyanarayana T. (2021). Structural aspects of B-glucosidase of Myceliophthorathermophila (MtBgl3c) by homology modelling and molecular docking. J Biomol Struct Dyn. 1-18. DOI:10.1080/07391102.2020.1869095.

b. AnicaDadwal, Shilpa Sharma and Tulasi Satyanarayana. Progress in Ameliorating Beneficial Characteristics of Microbial Cellulases by Genetic Engineering Approaches for Cellulose Saccharification (2020). Frontiers in Microbiology, 11, 1387 doi: 10.3389/fmicb.2020.01387

c. Shilpa Sharma. Enhanced antibacterial efficacy of silver nanoparticles immobilized in a chitosan nanocarrier. International Journal of Biological Macromolecules, 104,1740–1745, 2017



d. Shilpa Sharma, Chockalingam S., PallabSanpui, Arun Chattopadhyay and Siddhartha Sankar Ghosh. Silver Nanoparticles impregnated alginate-chitosan blended nanocarrier induces apoptosis in human glioblastoma cells. *Advanced Healthcare Materials*, 3,106-114, 2014.

4. E-mail: shilpa.nano@gmail.com, shilpa.sharma@nsut.ac.in

5. Phone: +91 9560534820

6. Home page: <http://www.nsit.ac.in/faculty/bt2/>

7. Bio-Sketch:

Dr. Shilpa Sharma was previously working as Scientist B in INST Mohali. She completed Ph D in Nanotechnology from IIT Guwahati and did post doc from AIIMS, New Delhi. Dr. Shilpa has authored several publications in various international journals and has presented papers in various national and international conferences. She is serving as Life Member of Association of Microbiologists of India and Founding Life Member of Indian Society of Nano Medicine. She received Shri Vinayak M. Deshpande Young Scientist Award for the year 2019 for her significant contribution to Chitin and Chitosan Research

4.7 Prof. Rakesh Bhatnagar

Professor Bhatnagar has recently joined the Department of BSE as adjunct faculty. He has been working in the field of anthrax for the past 20 years and has to his credit the development of genetically engineered vaccine against anthrax. The technology of recombinant anthrax vaccine has been transferred to Panacea Biotech Ltd. and the vaccine has successfully undergone Phase I and Phase II Human clinical trials. Also, his research group pioneered the expression of Protective Antigen gene in a plant system, which marks the first milestone towards developing edible vaccine against anthrax. DNA vaccine against Rabies has been developed in his laboratory and is ready for technology transfer. Further research is being done to develop DNA vaccine against anthrax. Laboratory is also engaged in study of programmed cell death in prokaryotes. His research group has recently initiated research in other important infectious disease systems like Mycobacterium, Brucella; aiming to open avenues for their control. Home page: <https://www.jnu.ac.in/Faculty/rbhatnagar/>



4.8 Prof. T Satyanarayana

Prof. T. Satyanarayana is Emeritus Professor at the Division of Biological Sciences & Engineering (BSE), Netaji Subhas University of Technology (NSUT), New Delhi. He received his M.Sc. and Ph.D. from Saugar University, India, and pursued postdoctoral studies in France. He has over four decades of research and teaching experience, and has received the Association of Microbiologists of India's Dr. G.B. Manjrekar Memorial Award, the Mycological Society of India's Dr. V. Agnihotrudu Memorial Award, and the Biotech Research Society's Malaviya Memorial Award for his valuable contributions. He is a Fellow of NAAS, AMI, BRSI, MSI and Telengana Academy of Sciences and a member of the Editorial Board of several journals. He has also served as reviewer for various respected journals. He has 40 years of research and teaching experience and was president of the AMI and MSI. His research has focused on understanding the diversity and applications of yeasts, thermophilic fungi, and bacteria and their enzymes as well as carbon sequestration using extremophilic bacterial carbonic anhydrase. He has edited several books, published scientific papers, and has three patents to his credit. He has over 20 scientific papers and reviews, eight edited books, and three patent to his credit.



4.9 Professor Ashok Kumar Srivastava

Dr. Ashok Kumar Srivastava has done his B.Tech&M.Tech degree in biochemical engineering from H.B. Technological Institute Kanpur in 1976 & 1978. He received his Ph.D. degree from the McGill University, Montreal in 1990. He has 42 years of Industrial - Research - Teaching experience in the area of Biochemical Engineering & Biotechnology. He has been the faculty member in the Biochemical engineering & Food technology department HB Technological Institute Kanpur for 10 years. Thereafter he has been associated with Department of Biochemical Engineering & Biotechnology IIT Delhi for about 30 years where-in he had been the head of the department for three years. He is the recipient of several awards & scholarships e.g; National Overseas Scholarship award of MHRD, New Delhi for Ph.D. studies (1985-1990), UNESCO fellowship award (6 months) Delft University, The Netherlands, "Biotechnology Overseas Associate ship" Germany & New Zealand (3 months each). He has 111 Journal papers, 165 International/National conference presentations & six



patent to his credit. He has been the PI/Co-PI of 20 Sponsored research projects. He has also established “state of the art” Centre of Excellence for mass production of biopolymers from the generous support of DBT, New Delhi. He has supervised 21 Ph.Ds & 76 Master’s theses. His main interest is in bioprocess optimization & scale up for microbial, plant and animal cell cultures & development of novel bioreactors for mass scale cultivation.

5. Laboratory Infrastructure

5.1 Drug Discovery Laboratory: The laboratory is equipped with state-of-art infrastructure to carry out research work in the area of drug discovery. Various equipments, for example, Rotary Evaporator, Agela Octopus Chromatography System, HPLC, Multimode Reader and UV-Visible Spectrophotometer make up the existing facilities of the lab. Fourier Transform Infra-Red Spectrophotometer is expected to arrive soon. The aims and objectives of DDL assume significance in view of Anti-microbial Resistance (AMR) that has been recognized as a serious threat to human health for India and the world.

5.2 Departmental Instrumentation Facility (DIF): The Departmental Instrumentation Facility in the BSE Division is a central research facility, which caters to the requirement of research scholars and faculty of the division. The lab has facility to conduct research work in varied areas such as Applied Microbiology, Recombinant DNA Technology, Structural Biology, Genomics & Proteomics and Nanotechnology. Equipment’s available in DIF lab are Biologic LP for Protein Purification, Gel Doc, Fermenter, Bench-top Centrifuge, Refrigerated Centrifuge, Mini Centrifuge, Freezer (-20°C), Bacteriological Incubators, Shaker Incubator, Oven, Autoclave, MilliQ Water Purification System, Gel Rocker, Gel Electrophoresis Unit (Vertical, Horizontal), Vortex Mixer, Magnetic Stirrer, Hot Plate, Laminar Room of BSL-2 level and other basic amenities.

5.3 Biosciences Laboratory: Bioscience Lab has facilities for training of students in Cell Biology, Biochemistry, Microbiology, Molecular Biology, Genetics, Structural Biology, Methods and Instrumentation in Biotechnology, Immunology, Enzymology, Recombinant DNA Technology, Plant/Animal Biotechnology and Genomics/Proteomics. The laboratory is equipped with Weighing Balance, Vortex, Mixer, Grinder, Horizontal and Vertical Electrophoresis Unit with Power pack, Magnetic stirrer, pH meter,

Autoclave, Hot Air Oven, Cold storage facility Microfuge centrifuge, Laminar air flow workbenches, Heating plate, Microscopes etc.

5.4 Bioengineering Laboratory: The objective of Bioengineering laboratory is to provide facilities to build concept of engineering knowledge required for a biotechnology students by hands on experiments. The laboratory is well equipped with instruments and various laboratory experiments of both under graduate and post graduate courses are conducted in each semester. Apart from this under graduate students are also used to conduct their experiments required for their final year projects such as fuel cell, fermentation, biomass conversion, algae cultivation etc. in this laboratory.

5.5 Bioprocess Technology Laboratory: The laboratory is working on different emerging technologies in the area of bioprocesses and bio-products to advance and synergize innovation systems related to bioprocessing for development of value-added products. The objective is to lead a knowledge-based bio-processing mission through translational testing, optimization and up-scaling the existing technologies.

5.6 Computational and Structural Biology Laboratory: Students learn and use a range of computational techniques in Sequence/Structural Bioinformatics, Modeling/simulation of Biomolecular interactions, Drug target selection, Drug design, Network Biology as well as Computational Genomics and proteomics. The research focus is on Cardiovascular disease in humans as well as Stress response in bacteria. The laboratory has attracted external funding for research projects and scholars. The laboratory is equipped with computers, workstation and internet facility. Commercial SybylX software is available. Additional open source softwares like Cytoscape, Autodock, Deepview, Splitstree, Gromacs, and Amber are also used.

5.7 Bioinformatics facility: It is a newly developed, fully air-conditioned facility with seating for 35 students. At present there are 30 all-in-one i7 computers with wi-fi and power back up. The facility uses open source softwares for conducting UG and PG Bioinformatics practicals. A drug designing software was also recently purchased. Development of advanced computing capabilities are under process.

In addition, various labs are under development in the department:

- a) Biochemistry and Enzymology Lab
- b) Mammalian Cell Culture Laboratory

6. ELIGIBILITY FOR ADMISSION TO THE PhD PROGRAMME.

Master's Degree in Engineering/Technology/Sciences will be considered.

7 SYLLABUS FOR WRITTEN TEST:

The entrance test shall consist of 100 multiple choice questions. There shall be no negative marking. 50 questions shall be based on Research Aptitude/Methodology which shall include quantitative methods/computer applications, experimental techniques etc. and 50 questions shall be subject specific. The test shall be of Two hours.

Part A Research Aptitude/Methodology:

Unit-1 Research Aptitude

- Research: Meaning, Types, and Characteristics, Positivism and Post-positivistic approach to research.
- Methods of Research: Experimental, Descriptive, Historical, Qualitative and Quantitative methods.
- Steps of Research.
- Thesis and Article writing: Format and styles of referencing.
- Application of ICT in research.
- Research ethics.

Unit-2 Comprehension & Communication

- A passage of text be given. Questions be asked from the passage to be answered.
- Communication: Meaning, types and characteristics of communication.
- Effective communication: Verbal and Non-verbal, Inter-Cultural and group communications, Classroom communication.
- Barriers to effective communication.
- Mass-Media and Society.

Unit-3 Mathematical Reasoning and Aptitude

- Types of reasoning.

- Number series, Letter series, Codes and Relationships.
- Mathematical Aptitude (Fraction, Time & Distance, Ratio, Proportion and Percentage, Profit and Loss, Interest and Discounting, Averages etc.) Unit-VI Logical Reasoning
- Understanding the structure of arguments: argument forms, structure of categorical propositions, Mood and Figure, Formal and Informal fallacies, Uses of language, Connotations and denotations of terms, Classical square of opposition.
- Evaluating and distinguishing deductive and inductive reasoning.
- Analogies.
- Venn diagram: Simple and multiple use for establishing validity of arguments.

Unit-4 Data Interpretation

- Sources, acquisition and classification of Data.
- Quantitative and Qualitative Data.
- Graphical representation (Bar-chart, Histograms, Pie-chart, Table-chart and Line-chart) and mapping of Data.
- Data Interpretation.
- Data and Governance.

Unit-5 Information and Communication Technology (ICT)

- ICT: General abbreviations and terminology.
- Basics of Internet, Intranet, E-mail, Audio and Video-conferencing.
- Digital initiatives in higher education.
- ICT and Governance.

NOTE: (i) Equal number of questions are to be set from each Unit.

(ii) Whenever graphical/pictorial question(s) are set for sighted candidates, a passage followed by equal number of questions and weightage be set for visually impaired candidates.

Part B: Department Specific Subject:

UNIT 1 Biochemistry: Biomolecules-structure and functions; Biological membranes, structure, action potential and transport processes; Enzymes- classification, kinetics and mechanism of action; Basic concepts and designs of metabolism (carbohydrates, lipids, amino acids and nucleic acids) photosynthesis, respiration and electron transport chain; Bioenergetics

UNIT 2 Microbiology: Viruses- structure and classification; Microbial classification and diversity (bacterial, algal and fungal); Methods in

microbiology; Microbial growth and nutrition; Aerobic and anaerobic respiration; Nitrogen fixation; Microbial diseases and host-pathogen interaction

UNIT 3 Cell Biology: Prokaryotic and eukaryotic cell structure; Cell cycle and cell growth control; Cell-Cell communication, Cell signaling and signal transduction

UNIT 4 Molecular Biology and Genetics: Molecular structure of genes and chromosomes; Mutations and mutagenesis; Nucleic acid replication, transcription, translation and their regulatory mechanisms in prokaryotes and eukaryotes; Mendelian inheritance; Gene interaction; Complementation; Linkage, recombination and chromosome mapping; Extra chromosomal inheritance; Microbial genetics (plasmids, transformation, transduction, conjugation); Horizontal gene transfer and Transposable elements; RNA interference; DNA damage and repair; Chromosomal variation; Molecular basis of genetic diseases

UNIT 5 Analytical Techniques: Principles of microscopy-light, electron, fluorescent and confocal; Centrifugation- high speed and ultra; Principles of spectroscopy-UV, visible, CD, IR, FTIR, Raman, MS,NMR; Principles of chromatography- ion exchange, gel filtration, hydrophobic interaction, affinity, GC,HPLC, FPLC; Electrophoresis; Microarray

UNIT 6 Immunology: History of Immunology; Innate, humoral and cell mediated immunity; Antigen; Antibody structure and function; Molecular basis of antibody diversity; Synthesis of antibody and secretion; Antigen-antibody reaction; Complement; Primary and secondary lymphoid organ; B and T cells and macrophages; Major histocompatibility complex (MHC); Antigen processing and presentation; Polyclonal and monoclonal antibody; Regulation of immune response; Immune tolerance; Hypersensitivity; Autoimmunity; Graft versus host reaction.

UNIT 7 Bioinformatics: Major bioinformatic resources and search tools; Sequence and structure databases; Sequence analysis (biomolecular sequence file formats, scoring matrices, sequence alignment, phylogeny); Data mining and analytical tools for genomic and proteomic studies; Molecular dynamics and simulations (basic concepts including force fields, protein-protein, protein-nucleic acid, protein-ligand interaction). Machine learning methods, structural Bioinformatics, Next generation sequencing, Drug design and discovery, Bioinformatics principles for Genomics, proteomics and Systems Biology

UNIT 8 Recombinant DNA Technology

UNIT 9 Restriction and modification enzymes; Vectors; plasmid, bacteriophage and other viral vectors, cosmids, Ti plasmid, yeast artificial

chromosome; mammalian and plant expression vectors; cDNA and genomic DNA library; Gene isolation, cloning and expression ; Transposons and gene targeting; DNA labeling; DNA sequencing; Polymerase chain reactions; DNA fingerprinting; Southern and northern blotting; In-situ hybridization; RAPD, RFLP; Site-directed mutagenesis; Gene transfer technologies; Gene therapy

UNIT 10 Plant and Animal Biotechnology

UNIT 11 Totipotency; Regeneration of plants; Plant growth regulators and elicitors; Tissue culture and Cell suspension culture system: methodology, kinetics of growth and, nutrient optimization; Production of secondary metabolites by plant suspension cultures; Hairy root culture; transgenic plants; Plant products of industrial importance

UNIT 12 Animal cell culture; media composition and growth conditions; Animal cell and tissue preservation; Anchorage and non-anchorage dependent cell culture; Kinetics of cell growth; Micro & macro-carrier culture; Hybridoma technology; Stem cell technology; Animal cloning; Transgenic animals

UNIT 13 Bioprocess Engineering and Process Biotechnology

UNIT 14 Chemical engineering principles applied to biological system, Principle of reactor design, ideal and non-ideal multiphase bioreactors, mass and heat transfer; Rheology of fermentation fluids, Aeration and agitation; Media formulation and optimization; Kinetics of microbial growth, substrate utilization and product formation; Sterilization of air and media; Batch, fed-batch and continuous processes; Various types of microbial and enzyme reactors; Instrumentation control and optimization; Unit operations in solid-liquid separation and liquid-liquid extraction; Process scale-up, economics and feasibility analysis

UNIT 15 Engineering principle of bioprocessing- Upstream production and downstream; Bioprocess design and development from lab to industrial scale; Microbial, animal and plant cell culture platforms; Production of biomass and primary/secondary metabolites; Biofuels, Bioplastics, industrial enzymes, antibiotics; Large scale production and purification of recombinant proteins; Industrial application of chromatographic and membrane based bioseparation methods; Immobilization of biocatalysts (enzymes and cells) for bioconversion processes; Bioremediation-Aerobic and anaerobic processes for stabilization of solid / liquid wastes.

6.4 FACULTY OF INFRASTRUCTURE TECHNOLOGY

6.4.1 DEPARTMENT OF CIVIL ENGINEERING (WEST CAMPUS)

1. The Department

The Department of Civil Engineering, Netaji Subhas University of Technology, West Campus (formerly Ch. Brahm Prakash Government Engineering College Jaffarpur) was established in the year 2007. The First batch of B. Tech. (Civil Engineering) passed out in the year 2011. The placement of the department has always been excellent. The department of civil engineering has been known for its exceptionally strong Under-Graduate students and now one Post-Graduate programme in Environmental Engineering along with Research programmes in Environmental and Geoinformatics has been started from the academic session of 2020-21. Post graduation programme in Structural Engineering is going to be started from the academic session of 2023.

The department has always been producing excellent quality graduate students in civil engineering. Since its inception, eminent professors have been appointed as principals and faculty members in the department by Delhi Government. These faculty members are highly dedicated in overall development of the department by bestowing quality engineering education and research. As all of these faculty members have tried to take the department to greater heights not only in academics, but also tried their best for all round development of the students in sports, cultural and literary activities. The Department has esteemed and renowned Professors, Associate Professors and Assistant Professors.

1. Courses Offered

The Department offers 02 Undergraduate (UG) and 01 Postgraduate (PG) and Ph.D. programmes. The UG programme in civil engineering was started in 2007 right from the inception of the Institute. Due to recent developments in the field of geographic information system and remote sensing along with environmental issues and climate changes one UG programme in Geoinformatics and one PG programme in Environmental Engineering has been started in the academic session of 2020-21. The Master of Technology programmes is a two-year course-based programme. Students take about 12 courses from within and outside the Department, according to the programme requirements. The courses offered are of high standard, many

include advanced topics and topics based on recent research. In addition, the Department also offers high quality research programme at the doctoral level. To keep in pace with the current technological advancements, the UG and PG curriculum has been recently modified so that the students get a feel of what exactly is happening outside in the tech-world.

- B.Tech.-Civil Engineering: with intake of 60 students - Eight Semesters - Choice Based Credit System
- B.Tech.-Geoinformatics with intake of 60 students - Eight Semesters - Choice Based Credit System
- M.Tech. –Environmental Engineering with in take of 12 students - Four Semesters - Choice Based Credit System
- M.Tech. –Structural Engineering with in take of 30 students - Four Semesters - Choice Based Credit System wef 2023 onwards.
- Doctor of Philosophy (Ph.D.)

- **Areas of Research and Available Seats**

Presently our faculty is undertaking research in following broad areas:

- **Environmental Engineering**

Water and Wastewater Treatment, Solid Waste Disposal and Management, Air Quality monitoring and modeling, Material composites, Green buildings, Green materials, Ground water quality modeling, Surface and sub surface water quality modeling and development, ground water contamination, Environmental Impact assessment, Environmental chemistry and microbiology.

- **Surveying and Geoinformatics**

Photogrammetry, Optical and Microwave Remote Sensing, GIS, Geospatial Applications, Artificial Intelligence, Machine Learning and Expert Systems

- **Structural Engineering**

Concrete Structures, Composite Materials, Earthquake Engineering, Structural Dynamics, Plates and Shells, Finite Element Analysis, Computational Mechanics, Two- and three- dimensional Photoelasticity, Dynamic Photoelasticity, Static& Dynamic Electrical resistance Strain Gauge Studies, Transducer Development, Computer Applications and Computational Mechanics Work.

- **Transportation Engineering**

Air, rail, and marine transportation operations, Connected and automated vehicles, Multimodal transportation operations, Traffic management and

control, Traffic modeling and simulation, Transportation system policy and planning, Transportation data science, Travel demand modeling, Travel choice analysis

- **Geotechnical Engineering**

Geotechnical Earthquake Engineering (Soil Liquefaction, Engineering Seismology, Seismic Hazard Analysis, Ground motion models, Seismic source characterization), Collapsing soils, Dispersive soils, Expansive soils (Swell amount and swell pressures, Lateral swell behavior), Stabilization of soils by waste materials, Use of fly ash for soil stabilization, Soil stabilization by bacterial cementation, 2D and 3D Numerical Modeling, Unsaturated Soils (Triaxial testing of unsaturated soils for modeling unsaturated soil strength and deformation, Soil-water retention curve prediction and hysteresis, Hydraulic conductivity function and flow modeling, Geotechnical testing system and methodology development, Slopes and Landslides, Rainfall triggered landslides, Stabilization of slopes by passive piles, Embankment dams, Behavior of earth and rock fill dams under earthquake motions, Ground Improvement, Stone columns, Geosynthetics, Offshore Geotechnical Engineering, Offshore foundations, Retaining walls and Deep Excavations.

- **Water resources and Hydrology**

Rain Water Harvesting, Water supply Scheme, Treatment of Sewage, Analysis of Flood & Drought, Durability of Dam, Reservoir sedimentation in any region study, study on floods and droughts in any area by using any computing techniques like MATLAB, Excel, GIS, Dam break analysis, study on swat models, flood peak estimation, study on the rivers by hec -ras models (river analysis system), study on groundwater data pertaining to any region

- **Construction Planning and management**

Construction management for sustainability, Applicability of Green Engineering Solution, Green Technology application in construction, Green Tech Knowledge of Construction Workforce and Empowerment of knowledge in Construction Project, Theory of Constraints in Construction Projects, Contradiction analysis of Construction Innovation, Radical Reduction in Project Cycle Time, Trade-Off Between Project Cost and Schedule, Optimizing Construction Input on Front-End Planning, Repair, Rehabilitation and Renewal of Underground Infrastructure, Infrastructure Asset Management

1. Tentative Seats

For the session 2022-23 Even sem, the maximum number of seats in the Department of Civil Engineering (West Campus) are limited to

1. Seats with university fellowship: 12

2. Seats without university fellowship: 12

University reserves the right to change the number of seats.

***The table below indicates the maximum number of vacancies available in various areas of research. However, the total number of seats are as given above**

S. No.	Area of Research	Faculty	Maximum no. of vacancies	
			With Univ. fellowship (TRF)	Without Univ. Fellowship Self-Sponsored, UGC, CSIR, DST RF and others
1.	Geoinformatics	Prof. K.C. Tiwari	NIL	NIL
2.	Environmental Engineering	Prof. K. R. Harne	NIL	NIL
3.	Environmental Engineering	Prof. Athar Hussain	NIL	NIL
4.	Structural Engineering	Prof. Dulal Goldar	NIL	01
5.	Geoinformatics/Environmental	Prof. A. K. Nigam	01	01
6.	Structural Engineering	Prof. Mehtab Alam	01	01
7.	Environmental Engineering	Prof. Izhar Farooqui	01	01
8.	Geotechnical Engineering/Concrete Technology	Prof. Anil Kumar Sahu	01	01

9.	Geotechnical Engineering	Dr. Vikas Pratap Singh	01	01
10	Environmental Engineering	Dr. Gaurav Saini	NIL	NIL
11	Structural Engineering	Dr. Rajan L. Wankhade	01	01
12	Geoinformatics	Dr. Shray Pathak	01	02
13	Geotechnical Engineering	Dr. Partha Das	01	NIL
14	Transportation Engineering	Dr. Aswathy R	01	01
15	Structural Engineering	Dr. SulaemMusaddi qLaskar	01	01
16	Geotechnical Engineering/Materials	Dr. Anant Lal Murmu	01	01
17	Structural Engineering	Dr. Arghya Ghosh	01	-
<p>The number of candidates to be taken by faculty is counted only once and in any one of the research fields available.</p>				

Note: The vacancies displayed in the Table above against same faculty member in different research groups are only indicative in nature. Vacancy in one research area belonging to a faculty member is convertible to a vacancy in another research area belonging to the same faculty member.

4.FACULTY PROFILE

4.1 Prof. Athar Hussain

1. Designation, Qualifications:

Professor & Head (Civil Engineering),
Ph.D.

2. **Areas of Interest:** Water and Wastewater Treatment, Solid Waste Disposal and Management, Air Quality monitoring and modeling, Material composites, groundwater modeling.

3. **E-mail:** athar.hussain@nsut.ac.in

4. **Phone:** 9990629684, 9310692172

5. **Home Page:** http://gecdelhi.ac.in/pdf_files/Faculty1

. Treatment of phenolic wastewater by Athar Hussain, Indu Mehrotra and Pradeep Kumar, Vol. 250, 35-41, 2010, (I.F. 7.098) Desalination, Elsevier Science, DOI: 10.1016/j.desal.2009.09.018.

a. Nitrogen biotransformation in anaerobic treatment of phenolic wastewater by Athar Hussain, Indu Mehrotra and Pradeep Kumar, Vol. 250, 35-41, 2010, (I.F. 7.098) Desalination, Elsevier Science, DOI: 10.1016/j.desal.2009.09.018.

b. Biomethanation Potential for Co-digestion of Municipal Solid Waste and Rice Straw: A Batch Study by Athar Hussain, Suraj Negi, Hiya Dhar, Sunil Kumar, Vol. 254, pp 139-144, 2018, Bioresource Technology, Elsevier, (I.F. 7.539) doi.org/10.1016/j.biortech. 2018. 01.070

6. Bio-Sketch: Dr. Athar Hussain is working as a Professor and Head (Civil Engineering Department) at NSUT WEST CAMPUS (former CBPGEC Jaffarpur), New Delhi. Dr. Hussain completed his B.Tech. (Civil Engineering) from Jamia Millia Islamia in 1998, M.Tech. from AMU Aligarh in 2001 and completed his Ph.D. in Environmental Engineering from IIT Roorkee in 2007. His research area includes industrial wastewater treatment, water quality management and solid waste management with special focus on anaerobic treatment of wastewater and solid waste with prime focus on renewable energy. He has supervised many Ph.D. Research Scholars in diversified areas of environmental engineering of which some have been awarded degree. Dr. Hussain has more than 15 years of experience in the area of teaching, research and consultancy. He has also guided more than 60 M.Tech dissertations. He has published more than 125 papers in international



refereed journals and international conferences. Dr. Hussain has published few books on water and wastewater treatment, IGI Global USA and is also serving as a reviewer for many International journals like Taylor and Francis, Inderscience Publishers, Elsevier Science etc. He is also a Fellow member of The Institution of Engineers (IE) India, Member ASCE, Member of Institution of valuers” (IV) N. Delhi, India and Member of Indian Society of Wind Engineering, India. Dr. Hussain has represented India many times through international conferences and also through training programmes held abroad being sponsored jointly by NPC, India and APO, Tokyo.

4.2 Prof. (Col) KC Tiwari

1. Designation, Qualifications: Professor, Ph.D.

2. Areas of Interest: Optical and Microwave Remote Sensing, GIS, Geospatial Applications, Artificial Intelligence, Machine Learning and Expert Systems



0. **Email:** kcchtphd@gmail.com

0. **Phone no.:** 9971862304

0. **Link to home page:**

<http://www.dtu.ac.in/Web/Departments/Civil/faculty/kctiwari.php>

6. Selected Publications:

- Dwijendra Pandey and K. C. Tiwari. 2020. **Extraction of Urban Built-up Surfaces and Its Subclasses using Existing Built-up Indices with Separability Analysis of Spectrally Mixed Classes in AVIRIS-NG Imagery.** Advances in Space Research.
- Dwijendra Pandey and Tiwari K.C (2020). **Feature Identification and Extraction of Urban Built-up Surfaces and Materials in AVIRIS-NG Hyperspectral Imagery.** Geocarto International.
- **Bhandari, A. &Tiwari, K.C. (2020).** A Euclidean Distance based Super Resolution method for Sub Pixel target detection in Hyperspectral Image. GIS Business

7. Bio-sketch: Dr (Col) KC Tiwari completed his BE (Civil) degree from Moti Lal Nehru National Institute of Technology, Allahabad (erstwhile Regional Engineering College) in 1986. After completion of his Bachelor's Degree, he joined Corps of Engineers, Indian Army and served in different terrains and different operational formations from High Altitude to Insurgency for 23

years. He also participated in Op-Parakram post attack on Indian Parliament. While in the Army, he was sponsored for ME Civil (Computer Aided Design) at IIT Roorkee (erstwhile University of Roorkee) and completed it in 1999. During his M. Tech project, he classified one of the Indian Satellite – LISS – III data of Roorkee, Uttarakhand using artificial neural network (ANN) and studied the effects of various neural network parameters on classification accuracy. Subsequently, after the Indian Army was withdrawn from Op – Parakram, he took study leave and completed his Ph.D from IIT Roorkee in 2007. The topic of his research was – ‘Target Detection using Optical and Microwave Remote Sensing’. The work involved detection of aircrafts as small military targets in hyperspectral data, and detection of shallow buried landmines using spectrometer based microwave data. He took voluntary retirement from the Army and joined Academics. He is currently working in various geospatial/geoinformatics applications using microwave, hyperspectral and Lidar data.

4.3 Prof. K R Harne

1. Designation, Qualifications:

Professor, Ph.D.

2. Areas of Interest: Advanced Water Treatment and Green Building, Wetlands, Non-Point Sources of Pollution,

3. E-mail: *harne.kailash@nsut.ac.in*

4. Phone: +91 11 25318158

5. Home Page:

6. Selected Publications:

. Filed and published a patent titled ‘Hybrid Passive Downdraft Evaporative Cooling System’ vide patent application no. TEMP/E-1/51106/2019-DEL dated 26.11.2019.

a. Paper published in International Journal of Agricultural and Environmental Information System titled ‘*Rainfall runoff Modeling of Sutlej River Basin (India) using Soft Computing Techniques*’ Volume 10, Issue 2, April-June 2019

b. Paper Published in International Journal of Advanced Technology in Civil Engineering ISSN:2231-5721 titled ‘*Advanced Method for Sewage Water Treatment*’ Volume1, Issue 2, 2012, Pp 94-98

7. Bio-Sketch: Dr. K. R. Harne received his B. Tech in Civil Engineering from Sant Gadgebaba Amravati University, Amravati in 1987, and M. Tech



(1993) from Government Engineering College, Amravati and Ph. D (2003) from IIT Roorkee. He worked as a Principal in different colleges in Baba Sahib Ambedkar Marathwada University, Aurangabad and Savitribai Phule Pune University Pune, from 01.01.2007 to 21.07.2015. He has joined Netaji Subhas University of Technology (NSUT), West Campus the then Ch. Brahm Prakash Government Engineering College, Jaffarpur, New Delhi through Union Public Service Commission (UPSC) in 2015, and has since served in many capacities. Although he has held several administrative positions like the Dean (Academics), Dean (IRD), Head, Department Civil Engineering, Head Department of Environmental Engineering and at heart he is a committed teacher and researcher.

Prof Harne's research spanning a period of more than 30 years is concerned with the development of new techniques of water and Wastewater Treatment; several of these are of fundamental importance and have been extensively cited in literature including textbooks and reference works. He has also attempted to make some contributions to indigenous R&D efforts, in the form of field studies and consultation in Public Works Department, Jal Nigam undertaking technologically advanced projects of Bridges, underpasses etc. Dr. Harne was deeply involved in the process of establishment of the Pune District Education Association's College of Engineering Pune and has served as a Principal of this School. As a Principal of the Institute, he took several major academic initiatives. Dr. Harne has also helped his students set up their own businesses/ companies with a view to encourage entrepreneurship.

4.4 Prof. Dulal Goldar

1. **Designation, Qualifications:** Adjunct Professor (Civil Engineering), Ph.D.
2. **Areas of Interest:** Two- and three- dimensional Photoelasticity, Dynamic Photoelasticity, Static & Dynamic Electrical resistance Strain Gauge Studies, Transducer Development, Computer Applications and Computational Mechanics Work..
3. **E-mail:** dulalgoldar@gmail.com, dulalgoldar@yahoo.co.in
4. **Phone:** 9810489441
5. **Home Page:**
6. **Selected Publications:**



. Development and Calibration of a Dynamic Contact- Force Transducer- by D.Goldar et.al, J. Experimental Mechanics, September, 1984 pp.187-190.

- a. “Plate –concrete interfacial bond strength of FRP and metallic plated concrete specimens” by Goldar D, Sharma SK, Mohamed Ali MS, Sikdar PK. Composites: Part B 2006; 37: 54-63
- b. “Investigation of critical diagonal crack debonding in plated RC beams, Prof. D. Goldar, S.K. Sharma, M.S. Mohamed Ali, P.K. Sikdar, Article in press ScienceDirect Composite Part-B (2007), www.elsevier.com/locate/composites

0. **Bio-Sketch:** Prof. Dulal Goldar is a distinguished Faculty Awarded by DCE Alumni Association on Feb.06, 2010 and an outstanding Concrete Engineer of Western UP Award for year 2014 by ICI (Indian Concrete Institute) on September 6, 2014. He is a FORMER PRINCIPAL, DCE, & Professor of Structural Engineering. He did his PhD. & M.E. Civil Engg. (Structures) (1983) Punjab University, Punjab Engineering College and B.E.CivilEngg. Calcutta University (1967), Bengal Engineering College,(Now IEST, Shibpur). He has been a Consultant Design Structural Engineer on various projects. His Research interests include Two- and three- dimensional Photoelasticity, DynamicPhotoelasticity, Static & Dynamic Electrical resistance Strain Gauge Studies, Transducer Development, Computer Applications and Computational Mechanics Work. He has guided many Ph.D. scholars in Civil Engg. (Structures) and has guided more than 25 M. Tech. Dissertations. He has published more than 50 papers in various international journals and conferences. He is having more than 42 years of teaching experience. He is a member of Professional Society including Fellow Indian Association of Structural Engineers, Member of the Governing Council, Indian Association of Structural Engineers (IAStructE), Member of Society for Experimental Mechanics Inc. (SEM), USA (Since 1976), Life Member of Indian Society for Construction Materials and Structures (ISCMS), Life Member of Indian Society for Wind Engineering, Member of Steering Committee of Asian Society on Experimental Mechanics (ASEM) From India (Since 1997).

4.5 Prof. A. K. Nigam

1 **Designation &Qualification** : Professor Emeritus, Ph.D.

2. **Area of Interest:** Surveying &Photogrammetry, Application of Remote Sensing and GIS in Water



Resources, environmental Engineering and Urban Planning. Mathematical modeling.

3. **E Mail:** anjani.nigam@nsut.ac.in, anjani.k.nigam@gmail.com

4. **Phone no.:** 9935016061

5. Selected Publications:

. Development of inversion algorithm for dry snow density estimation and its application with ENVISAT – ASAR dual co-polarization data, Snehmani, G.Venkataraman, A.K.Nigam and Gulab Singh, pp. 1 – 20, 2010, Geo – Carto International, Taylor & Francis. DOI: 10.1080/10106049.2010.516843

a. Assessment and Management of Ganga River Water Quality using Multivariate Statistical Techniques in India, Pradeep kumar, Rajendra Kumar Kaushal and Anjani K. Nigam, Vol. 12, No. 4, pp. 61 – 69, 2016, Asian Journal of Water, Environment and Pollution, DOI 10.3233/AJW-15001

b. Landfill site selection in India using analytic hierarchy and geographic information, Rucin Agrawal, Amitabh Kumar Srivastava and Anjani Kumar Nigam and Vol. 173, No. 1, pp. 6 – 14, 2020, Proceedings of the Institution of Civil Engineers- Waste and Resource Management. <https://doi.org/10.1680/jwarm.18.00026>

7. Bio- Sketch:

Dr. A. K Nigam completed his B.Tech. in Civil Engineering from Harcourt Butler Technological Institute, Kanpur (now H.B.T.U.) in 1983. He completed his Master's degree in Survey and Photogrammetric Engineering from Civil Engineering Department of University of Roorkee in 1986. He has also obtained Doctoral degree from UOR now IIT Roorkee in 1998 under Quality Improvement Programme. The area of research was on Rainfall Runoff Modeling using Remote Sensing Data and GIS using Strathyclide River Basin Model. He has served at NIH Roorkee for about one year. He has about 35 year experience of teaching in IET, Lucknow, HBTI, Kanpur and BIET, Jhansi. He has guided more than 50 B.Tech. Projects about 25 M.Tech theses. He has also guided 02 Ph.D. Once he visited Las Vegas to present a paper in a prestigious conference in 2000. He was TEQIP3 Coordinator at BIET Jhansi and headed the department three times. He has also provided civil consultancy to various government and private sectors. He is currently Professor emeritus in Civil engineering Department.

4.6 Dr. Izhar Farooqi

1. **Designation, Qualifications:**

Adjunct Professor, Ph.D.

2. **Areas of Interest:** Environmental Engineering, Corrosion Control, Biological Treatment, Water and Wastewater Treatment.

3. **E-mail:** farooqi_izhar@yahoo.com

4. **Phone:** 9412176757

5. **Home Page:**

6. **Selected Publications**

. Bioenergy production and slaughterhouse wastewater treatment in column type anaerobic sequencing batch reactor without any external mixer or gas/liquid recirculation by Farrukh (3), 04021004, 2021, Journal of Environmental Engineering (ASCE)

a. Improved anaerobic digestion of palm oil mill effluent and biogas production by ultrasonication pretreatment by MH Isa, LP Wong, MJK Bashir, N Shafiq, SRM Kutty, IH Farooqi, HC Lee, Vol. 722, 137833, 2020, Science of the Total Environment (<https://doi.org/10.1016/j.scitotenv.2020.137833>)

b. Performance Evaluation of Column – SBR in Paper and Pulp Wastewater Treatment: Optimization and Biokinetics by Nadeem A. Khan, Saif Ullah Khan, Dar Tafazul Islam, Sirajuddin Ahmed, IzharulHaq Farooqi, Mohamed Hasnain Isa, Arshad Hussain, FazlollahChangani, Astha Dhingra, 2019, Desalination and Water Treatment 2019. (doi:10.5004/dwt.2019.23775)

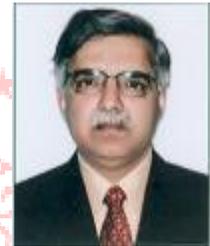
7. Bio-Sketch: Dr. Farooqi has been working in the environmental engineering field for the last thirty two years. The areas of specialization are water and wastewater treatment including Biological treatment, Biodegradation of toxic wastes, corrosion control. Teaching interests include Biological treatment of wastewaters, environmental chemistry and microbiology, Industrial water treatment. Dr. Farooqi has published One hundred and seven papers in international /national journals and conferences. having citations more than 1770 (h - index 24 and i10 - index as 43). Some of the journals in which papers have been published include Water Science and Technology, Elsevier Journal of hazardous waste, Waste Management, Trends in Analytical Chemistry, Journal of Cleaner Production, Bioresource Technology, Elsevier Journal of Environmental Science Taylor and Francis journal of Environmental Technology, Royal Society of Chemistry, British Corrosion Journal, American Journal of CORROSION,



Journal of Corrosion Prevention and Control and Anti Corrosion Methods and Materials. Apart from this Dr. Farooqi has presented research papers in international conferences in U.S.A., Switzerland, Norway, Netherlands, Malaysia, Singapore, Italy, Saudi Arabia, Denmark, London and in different places in India. Dr. Farooqi has delivered more than hundred invited talks. Dr. Farooqi has mobilized a large amount of consultancy and has been an expert member in the various national bodies. Dr. Farooqi has supervised six Ph.D scholars and several are under supervision. Dr. Farooqi has supervised 73 M.Tech. dissertations. Besides Dr. Farooqi has received six research projects from different organizations. Dr. Farooqi has participated in the Ministry of Human Resource Development, MHRD's Leadership for Academicians Program (LeAP) and has attended one weeks training program at Monash University, Melbourne, Australia under the same program. Also received the Young Scientist Award from UP Council of Science and Technology in 2002.

4.7 Dr. Mehtab Alam

1. **Designation,** **Qualifications:** Professor Emeritus,
Ph.D.



2. **Areas of Interest:** Structures, Impact Mechanics and Recycling of demolished Concrete Waste, Earthquake Disaster and Crisis management, Earthquake Engineering, Blast Loading on Structure.

3. **E-mail:** mehtab.alam@nsut.ac.in

4. **Phone:** 9868502341

5. **Home Page:**

6. **Selected Publications:**

. Behavior of Ordinary Load-Bearing Masonry Structure Under Distant Large Explosion, Beirut Scenario by MehtabAlam, SM Anas, Resilient Infrastructure, 239-253, 2021.

a. An experimental study on effect of aluminum composite panel waste on performance of cement concrete, A Paktiawal, MehtabAlam, Ain Shams Engineering Journal 12 (1), 83-98, 2021

b. Relative Performance of Linear Quadratic Regulator and Pole Placement Technique for Active Seismic Control of Structures, F Rather, MehtabAlam, Earth and Environmental Science 614 (1), 1-9, 2020

7. **Bio-Sketch:** Dr. Alam is working as an Emeritus Professor in the Civil Engineering Department at NSUT West Campus, Jaffarpur, New Delhi. Dr.

Alam completed his B.Sc (Civil Engineering) from AMU in 1985, M.Tech. from IIT Delhi in 1990 and Ph.D. from IIT, Delhi in 1999. His research interests include Structures, Impact Mechanics and Recycling of demolished Concrete Waste, Earthquake Disaster and Crisis management, Earthquake Engineering, Blast Loading on Structure. Dr. Alam has more than 37 years of experience in the area of teaching, research and consultancy. He has guided several research-based projects and dissertations at UG, PG and PhD levels. He has published 100+ research articles / chapters in refereed international journals, conferences, and books. Dr. Alam is also serving as a reviewer for many International journals and has also served as part of various expert panels at national level. He is a Life member of the ISTE, ISET and Ferro Cement Society of India.

4.8 Prof. Anil Kumar Sahu

1. **Designation, Qualifications:**

Adjunct Professor, Ph.D.

2. **Areas of Interest:** Geotechnical Engineering, Concrete Technology.

3. **E-mail:** sahanilkr@yahoo.co.in

4. **Phone:** 9868226856

5. **Home Page:**

6. **Selected Publications:**

. Heat and water flux modeling in an earth dam by Sushant Kumar, A.K.Sahu, Munendra Kumar, Water Science & Technology, June, 2021 pp 1-20, <https://doi.org/10.2166/wst.2021.241>

a. Numerical Analysis of Railway Sub structure with Geocell- Reinforced Ballast by Amninder Singh Nayyar and Anil Kumar Sahu, Geomechanics and Geoengineering- An international Journal, published by Taylor and Francis, May 2021,pp1-11, <https://doi.org/10.1080/17486025.2021.1928770>.

b. Modeling the effect of central impervious core and downstream filter geometry on seepage through earth dams by Sushant Kumar, Anil Kumar Sahu and Munendra Kumar, Ain Shams Engineering Journal, June, 2021 pp 1-11,<https://doi.org/10.1016/j.asej.2021.05.024>.

7. **Bio-Sketch:** Dr. Sahu is working as an Adjunct Professor in the Civil Engineering Department at NSUT West Campus, Jaffarpur, New Delhi. Dr. Sahu completed his B.E. (Civil Engineering) from Allahabad University in 1987, M.E. from Allahabad University in 1989 and Ph.D. from Bundelkhand University in 2006. His research interests include Geotechnical Engineering and Concrete Materials. Dr. Sahu has more than 30 years of experience in



the area of teaching, research and consultancy. He has guided several research-based projects and dissertations at UG, PG and PhD levels. He has published 100+ research articles / chapters in refereed international journals, conferences, and books. Dr. Sahu is also serving as a reviewer for many International journals and has also served as part of various expert panels at national level. He is also a Life member of the ISTE, ASCE, IGS, IE, etc. He has organized several conferences, workshops and training programs.

4.9 Dr. Vikas Pratap Singh

1. **Designation, Qualifications:** Associate Professor (Civil Engineering), Ph.D.

2. **Areas of Interest:** Reinforced earth structures, Ground improvement techniques, Geotechnical testing, Computational geo-technics, and Reliability-based analysis.



3. **E-mail:** vikas.singh@nsut.ac.in

4. **Phone:** 7572893890

5. **Home Page:** ...

6. **Selected Publications:**

a. Singh VP (2019). Reliability based stability assessment of natural slopes. Indian Geotechnical Journal, Vol. 49, No. 6 (December), pp. 698-707. (doi: 10.1007/s40098-019-00352-y).

b. Sivakumar Babu GL and Singh VP (2011). Reliability based load and resistance factors for soil nailing. Canadian Geotechnical Journal, Vol. 48, No. 6 (June), pp. 915-930. (doi: 10.1139/t11-005). [SCI, IF 2.802]

c. Singh VP and Sivakumar Babu GL (2010). 2D Numerical simulations of soil nail walls. Geotechnical and Geological Engineering, Vol. 28, No. 4 (July), pp. 299-309. (doi: 10.1007/s10706-009-9292-x).

7. **Bio-Sketch:** Dr. Vikas Pratap Singh is working as an Associate Professor in the Civil Engineering Department at NSUT West Campus, Jaffarpur, New Delhi. Dr. Singh completed his B.E. (Civil Engineering) from Visveswararajah Technological University Belgaum in 2002, M.Tech. from MNNIT Allahabad in 2005 and Ph.D. in Geotechnical Engineering from Indian Institute of

Science (IISc) Bangalore in 2009. His research area includes in-situ earth retaining structures with expertise in soil nailing technique, reinforced earth, analytical and computational modeling of geotechnical structures, reliability-based analysis, and ground improvement techniques. Dr. Singh has more than 12 years of experience in the area of teaching, research and consultancy. He has guided several research-based projects and dissertations at UG and PG level. He has published more than 41 research articles / chapters in refereed international journals, conferences, and books. Dr. Singh is also serving as a reviewer for many International journals such as Geotechnical & Geological Engineering Journal and Sadhana - Academy Proceedings in Engineering Science. He is also a Life member of the Indian Geotechnical Society (IGS) and Indian Roads Congress (IRC).

4.10 Dr. Gaurav Saini

1. **Designation, Qualifications:**

Associate Professor (Civil Engineering),
Ph.D.



2. **Areas of Interest:** Water & wastewater Treatment, sustainable processes, sustainable materials, waste management, bioremediation, contaminant transport.

3. **E-mail:** gaurav.saini@nsut.ac.in

4. **Phone:** 8287051260

5. **Home Page:**

6. **Selected Publications:**

a. M. Saleh, P. Esmaili, Z. Ameen, R. Abdulkadir, M.S. Gaya, G. Saini, S.I. Abba, 2021. Metro-environmental data approach for the prediction of chemical oxygen demand in new Nicosia wastewater treatment plant. Desal. Wat. Treat., 221: 31-40. <https://doi.org/10.5004/dwt.2021.27049>

b. G. Saini and P.S. Deepak, 2021. Wastewater-based epidemiology (WBE) for novel Coronavirus detection in wastewater. Glob. J. Environ. Sci. Mgmt., 7(4): 643-658. <https://dx.doi.org/10.22034/GJESM.2021.04.10>

c. S. I. Abba, Q. B. Pham, G. Saini, N. T. T. Linh; A. N. Ahmed, M. Mohajane, M. Khaledian, R.A. Abdulkadir and Q-V Bach, 2020. Implementation of Data Intelligence Models Coupled With an Ensemble Machine Learning For the Prediction of Water Quality Index. Env. Sci. Poll. Res., 27: 41524-41539. <https://doi.org/10.1007/s11356-020-09689-x>

7. **Bio-Sketch:** Dr. Gaurav Saini is working as an Associate Professor in the Civil Engineering Department at NSUT WEST CAMPUS, Jaffarpur, New Delhi.

Dr. Saini completed his B.E. (Environmental Engineering) from Delhi College of Engineering (currently Delhi Technological University) in 2003, M.S. and Ph.D. from the Oregon State University, United States in 2006 and 2010, respectively. He worked as a post-doctoral researcher at the University of Delaware, United States for 1.25 years. His research area includes sustainable processes, materials, pollution control, waste management, bioremediation, water and wastewater treatment, surface characterization and modeling. Dr. Saini has more than 12 years of experience in the area of teaching, research and consultancy. He has guided several research-based projects and dissertations at UG (40+), PG (48) and Ph.D. (4) levels. He has published more than 100 research articles / chapters in refereed international journals, conferences, and books. Dr. Saini also serves as an *ad hoc* reviewer for 23 International journals of repute. He is also a Life member of the Institution of Engineers, India. His work has resulted in **18 patent filings**, of which **3** have already been **granted**.

4.11 Dr. Rajan L. Wankhade

1. **Designation, Qualification:** Associate Professor in Civil Engineering, PhD in Civil Engineering.
2. **Area of Interest:** Structural Engineering, Finite Element Analysis, Linear and Nonlinear Analysis of Steel/RC Structures, Concrete Structures, Analysis of Smart Structures.
3. **E-mail:** rajan.wankhade@nsut.ac.in
4. **Phone:** 7758883183
5. **Homepage:** <http://www.nsit.ac.in/faculty/26/>



6. **Selected Publications:**
 - a. Rajan L. Wankhade and Kamal M. Bajoria, (2021) “Vibration Attenuation and Dynamic Control of Piezolaminated Plates with Coupled Electro-mechanical Actuation”, *Archive of Applied Mechanics*, Vol 91 (1), pp. 411-426, (SCI, Impact Factor: 2.467). DOI Number: <https://doi.org/10.1007/s00419-020-01780-6>.
 - b. Rajan L. Wankhade and Kamal M. Bajoria, (2019) “Vibration Analysis of Piezolaminated Plates for Sensing and Actuating Applications under Dynamic Excitations” *International Journal of Structural Stability and Dynamics*, Vol. 19 (10), 1950121. (SCI, Impact Factor: 2.957)
 - c. Rajan L. Wankhade and Kamal M. Bajoria, (2013) “Free Vibration

and Stability Analysis of Piezolaminated Plates using Finite Element Method”, *Smart Materials and Structures*, IOP Science, Volume 22(125040). (SCI, Impact Factor: 4.131)

7. **Bio-Sketch:** Dr. Rajan L. Wankhade is working as Associate Professor in Civil Engineering Department at NSUT, New Delhi. He received his B.E. Civil Engineering in 2007 and M.Tech. Structural Engineering in 2009 from Government College of Engineering, Amravati, India and completed his Ph.D. in Civil Engineering from Indian Institute of Technology Bombay, India in 2015. He has total Teaching experience of 12 years. His teaching and research interests are in the areas of Finite Element Analysis, Linear and Nonlinear Analysis, Design of RCC and Steel Structures, Analysis of Smart Piezolaminated Composite Plates, Development of Higher order shear deformation theories for beams/plates, Concrete Structures, Composite Structures. He has published 49 research papers in various refereed international journals, conferences, and books. He has 4 patents published to his credits. He is author of 2 Books. Dr.Wankhade is also serving as a reviewer for many international journals.

4.12 Dr. Shray Pathak

1. **Designation, Qualifications:**

Assistant Professor (Civil Engineering), Ph.D.

2. **Areas of Interest:** Remote Sensing and GIS applications, Water Resources Management and Planning, Hydrological Modeling, Urban and Coastal Flood Modeling, Climate Change, and Urban Heat Island

3. **E-mail:** shray.pathak@nsut.ac.in

4. **Phone:** 8954203033

5. Home Page:

6. **Selected Publications:**

a) Pathak, S., Liu, M., Jato-Espino, D., and Zevenbergen, C. (2020). Social, economic and environmental assessment of urban sub-catchment flood risks using a multi-criteria approach: A case study in Mumbai City, India, *Journal of Hydrology*, 591,125216. SCI Journal, IF-5.722

b) Pathak, S., Garg, R. D., Jato-Espino, D., Lakshmi, V., and Ojha, C. S. P. (2019). Evaluating hotspots for stormwater harvesting through participatory



sensing, Journal of Environmental Management, 242, 351-361, SCI Journal, IF- 6.789

c) Pathak, S., Ojha, C. S. P., Shukla, A. K. and Garg, R. D. (2019). Assessment of annual water-balance model for diverse Indian watersheds. ASCE Journal of Sustainable Water in the Built Environment, 5(3), 04019002.

7. Biosketch:

Dr. Shray Pathak is working as an Assistant Professor in the Civil Engineering Department at NSUT WEST CAMPUS, Jaffarpur, New Delhi. Dr. Pathak has received the Bachelor's degree in Civil Engineering from the National Institute of Technology (NIT), Kurukshetra, India in June 2012 and completed his Master's and Ph.D. degree in Civil Engineering from the Indian Institute of Technology (IIT), Roorkee, Uttarakhand, India in June 2014 and February 2019 respectively. His research interests include hydrology, remote sensing, GIS, urban sustainability and climate change. Earlier, he was employed as a Guest Faculty at National Institute of Technology (NIT) Kurukshetra, Haryana, India from Jan 2021 to Nov 2021. He has a post-doctoral experience of 1.5 years in School of Geographic Sciences, East China Normal University (ECNU), Shanghai, China (June 2019 to Dec 2020) and worked on the risk assessment analysis of urban flooding in coastal and non-coastal regions under extreme climate scenarios. Till date he has published 13 SCI peer reviewed journal articles, with 8 international and 2 national conferences along with 3 book chapters.

During his academic career, he attended and participated in various courses and workshops related to applications of space technology. He participated twice in the International summer program on water engineering by Southeast University, Nanjing, China (2016 and 2017). He was awarded several international scholarships and travel grants for attending conferences such as IGARSS 2016, AGU 2017, JpGU 2018, etc. Also, he got a 1-year TUBITAK research fellowship to pursue his research work in Turkey in 2015. He was awarded funding by Natural Environmental Research Council (NERC), UK, to present his research work on urban sustainable management and sponge cities at Imperial College, London in 2016. He got the OKP Scholarship to attend a short course at IHE Delft Institute for Water Education, The Netherlands in Feb, 2019. Recently, he was awarded São Paulo State Research Support Foundation (FAPESP) 2019 post-doctoral fellowship at the University of Sao Paulo, Brazil. Also, he is a recipient of International Postdoctoral Exchange Fellowship 2019 China, by China Post-Doc Foundation. Recently, he has received the 2022 Best Practice Oriented

Paper for the Journal paper published in ASCE Journal of Hazardous, Toxic and Radioactive Waste awarded by the American Society of Civil Engineers (ASCE).

4.13 Dr. Partha Das

1. **Designation, Qualifications:**

Assistant Professor (Civil Engineering), Ph.D.



2. **Areas of Interest:** Diffusion of contaminants through compacted clay barriers, Volume change behavior of highly plastic clays, Soil stabilization using waste material, Wetting-Induced slope stability analysis, Unsaturated Soil Mechanics, Artificial Intelligence in Geotechnical Engineering, Heritage Geotechnics

3. **E-mail:** partha.das@nsut.ac.in

4. **Phone:** 9652667307

5. Home Page:

6. **Selected Publications:**

a. **Partha Das** and Bharat TV (2021). Kaolin as a protective layer for solid waste landfills, Scientific Reports. 11, 10354. <https://doi.org/10.1038/s41598-021-89787-z>. Publisher: **Nature**.

b. **Partha Das** and Bharat TV (2021). Assessment of Clay Mineral Attenuation Capacity for Human Viral Pathogens, Journal of hazardous, toxic and radioactive waste, 26 (1), [https://doi.org/10.1061/\(ASCE\)HZ.2153-5515.0000643](https://doi.org/10.1061/(ASCE)HZ.2153-5515.0000643). Publisher: **ASCE**

c. **Partha Das** and Bharat Tadikonda Venkata (2020). Bentonite Clay: A Potential Natural Sanitizer for Preventing Neurological Disorders, ACS Chemical Neuroscience, 11:20, 3188-3190; DOI: 10.1021/acschemneuro.0c00609. Publisher: **American Chemical Society (ACS)**.

7. **Biosketch:**

Dr. Partha Das is working as an Assistant Professor in Civil Engineering Department at NSUT WEST CAMPUS, Jaffarpur, New Delhi. Dr. Das completed his B.E. (Civil Engineering) from Gauhati University in 2012, M.Tech with specialization in Geotechnical Engineering from NIT Warangal in 2014, and Ph.D. in Geo Environmental Engineering from IIT Guwahati in 2021. His research area includes contaminant transport through clay barrier systems, design of landfill liner facilities and wetting-induced slope stability

analysis. He has published various research articles in reputed SCI/SCIE/SCOPUS indexed Journals, International/National conferences and Book Chapters (Q1). Dr. Das is an **A.V. Shroff Biennial Paper awardee** conferred by the Indian Geotechnical Society for his research work. Dr. Das presented his research work at various platforms in India, China, and USA. He also received various **Best Paper** and **Best Presenter** Awards granted by University of Illinois-Chicago and Springer-Nature for presenting his research work at multiple platforms both in India and abroad. Dr. Das received a full travel grant from the Government of Peoples Republic of China for an exchange programme to China. Dr. Das is the reviewer of various peer-reviewed Journals, viz., Indian Geotechnical Journal, Springer; Journal of Hazardous, Toxic and Radioactive Waste, ASCE; Innovative Infrastructure Solution, Springer; etc. Before joining NSUT, Dr. Das worked as a faculty member at **NIT Tiruchirappalli** and introduced the post-graduate course “Unsaturated Soil Mechanics” for the first time in the institute.

4.14 Dr. Aswathy R

1. **Designation, Qualifications:**

Assistant Professor (Civil Engineering),
Ph.D.

2. **Areas of Interest:** Pavement design and modeling, Rheology of bituminous materials, Uncertainty Quantification and engineering applications, reliability design of pavements

3. **E-mail:** aswathy.r@nsut.ac.in

4. **Phone:** 9910122562

5. **Home Page:**



6. **Selected Publications:**

a. Rema, A., and Swamy, A.K., (2021). Use of Bayesian Model Averaging to Estimate Model Uncertainty for Predicting Strain in a Four-Layered Flexible pavement. ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering, 7(1): 04021002

b. Rema, A., and Swamy, A.K., (2019). Effect of construction methodology on uncertainty in asphalt concrete mastercurves, Journal of Transportation Engineering Part B-Pavements, ASCE, Vol 145(3), 04019021:1-12

c. Rema, A., and Swamy, A.K., (2018). Quantification of uncertainty in the mastercurves of viscoelastic properties of asphalt concrete, ASTM International-Advances in Civil Engineering Materials, Vol 7(2), 149-162.

7. Biosketch:

Dr. Aswathy R is working as an Assistant Professor in the Civil Engineering Department at NSUT WEST CAMPUS, Jaffarpur, New Delhi. Dr. Aswathy completed her B.Tech (Civil Engineering) from College of Engineering Trivandrum (CET) in 2010, M.Tech (Transportation Engineering and Management) from National Institute of Technology (NIT) Trichy in 2012 and completed her Ph.D. in Pavement Engineering from Indian Institute of Technology Delhi (IITD) in 2020. Her research area includes pavement design and modeling, rheology of bituminous materials and characterization, maintenance and rehabilitation of pavements, uncertainty perspectives in pavement design. She has published articles in various international/national journals, conferences and book chapters.

4.15 Dr. Anant Lal Murmu

1. Designation, Qualifications:

Assistant Professor (Civil Engineering),
Ph.D.

2. **Areas of Interest:** Geopolymer, Building Materials, Ground Improvement, Soil Stabilization, Sustainable Construction Materials

3. **E-mail:** anant.lal.murmu@nsut.ac.in

4. **Phone:** +91 9601936215

5. **Home Page:**

6. Selected Publications:

a. Raut Ashwin N, Singh Ranjit, **Murmu, A. L.** & Khan, K. A. (2022), Evaluation of thermal and energy consumption of novel foamed copper slag based geopolymer masonry blocks. Ceramic International, 1-14, DOI: 10.1016/j.ceramint.2022.01.070

b. **Murmu, A. L.**, & Patel, A. (2018). Towards Sustainable Bricks Production: An Overview. Construction and Building Materials, 165, 112-125. DOI: 10.1016/j.conbuildmat.2018.01.038

c. **Murmu, A. L.**, Jain, A., & Patel, A. (2019), Mechanical Properties of Alkali Activated Fly Ash Geopolymer Stabilized Expansive Clay. KSCE



7. Biosketch:

Dr. Anant Lal Murmu is working as an Assistant Professor in the Civil Engineering Department at NSUT WEST CAMPUS, Jaffarpur, New Delhi. Dr. Murmu completed his B.Tech (Civil Engineering) in 2010, M.Tech (Construction Technology and Management) in 2012 and PhD in Geotechnical Engineering from Visvesvaraya National Institute of Technology (NIT), Nagpur in 2020. His research area includes Geopolymer, Building Materials, Ground Improvement, Sustainable Construction Materials and Soil Stabilization. Dr. Murmu has over 5 years of teaching experience and has published several research articles in refereed journals. His paper titled "Towards Sustainable Bricks Production: An Overview" is among the top 100 cited papers of VNIT, Nagpur. He is also a Life member of the Institution of Engineers, India. Dr. Murmu is also serving as a reviewer for many international journals like Journal of Building Engineering, Environmental Earth Sciences, Building and Energy, Environment, Development and Sustainability, and Environmental Science and Pollution research.

4.16 Dr.

SulaemMusaddiqLaskar

1. Designation, Qualifications:

Assistant Professor (Civil Engineering),
Ph.D.

2. **Areas of Interest:** Repairing and Retrofitting of RC Structures, Non-Destructive Testing and Retrospective Design of Structures, Behaviour of RC members under static and dynamic loading, Bridge Engineering, Sustainable Materials in Construction, Alkali Activated and Light Weight Concrete

3. **E-mail:** sulaem.musaddiq.laskar@nsut.ac.in

4. **Phone:** +91-9864688249

5. **Home Page:**

6. Selected Publications:

a. **S. M. Laskar** and S. Talukdar, "Development of ultrafine slag-based geopolymer mortar for use as repairing mortar." ASCE Journal of Materials in Civil Engineering, 29 (5), 2017.



- b. **S. M. Laskar** and S. Talukdar, “Preparation and tests for workability, compressive and bond strength of ultra-fine slag based geopolymer as concrete repairing agent.” Elsevier, Construction and Building Materials, 154, pp 176 - 190, 2017.
- c. **S. M. Laskar** and S. Talukdar, “A study on the performance of damaged RC members repaired using ultra-fine slag based geopolymer mortar.” Elsevier, Construction and Building Materials, 217, pp 216 – 225, 2019.

7. Biosketch:

Dr. SulaemMusaddiqLaskar has earned the degree of Doctor of Philosophy in 2019 from Indian Institute of Technology Guwahati and the degrees, B.E. in Civil Engineering and M.Tech. in Earthquake Engineering from Assam Engineering College and National Institute of Technology Silchar respectively. During the tenure of Ph.D. thesis work, Dr. Laskar worked on Structural Engineering with specialization in Repairing and Retrofitting of RC Structures. Dr. Laskar studied the behaviour of Portland cementless mixes and their efficacy as concrete repairing and strengthening agent. Dr. Laskar’s current research interests include non-destructive testing and retrospective design of structures; repairing and retrofitting of structures; alkali activated and light weight concrete. Dr. Laskar’s other research interests are on study of behaviour of RC members under static and dynamic loading; bridge engineering; and sustainable materials in construction industry. Dr. Laskar has completed a NPIU and TEQIP III sponsored research project and has published many research papers in SCI indexed journals of Q1 category and book chapters. Dr. Laskar is also a Life member of the Institution of Engineers (India) and Indian Concrete Institute. Dr. Laskar is also serving as a reviewer for reputed national and international journals. Additionally, Dr. Laskar has also completed many consultancy projects related to structural analysis and design; concrete and steel quality control; non-destructive testing; bridge design.

4.17 Dr. Arghya Ghosh

1. Designation, Qualifications:

Assistant Professor (Civil Engineering), B.E. (Civil), M.E. (Structures), Ph.D.

2. Areas of Interest:

- Failure of Laminated Composite Plates and Shells.
- Finite Element Method, Geometric Nonlinearity.
- Stability of Civil Engineering Structures.



- Static and Dynamic Analyses of Advanced Structural Materials.
- 3. **E-mail:** arghya.ghosh@nsut.ac.in
- 4. **Phone:** (+91) 9804344254
- 5. **Home Page:**
- 6. **Selected Publications:**
 - a. D. Chatterjee, A. Ghosh and D. Chakravorty, Finite Element Prediction of First-Ply Failure Loads of Composite Thin Skewed Hypar Shells Using Nonlinear Strains, Thin-Walled Structures – Elsevier, 167(108159), 1-13, 2021.
 - 0. D. Chatterjee, A. Ghosh and D. Chakravorty, First Ply Failure Behaviour of Laminated Composite Skew Plates of Various Edge Conditions, Mechanics of Composite Materials – Springer, 57(5), 699-716, 2021.
 - 0. A. Ghosh and D. Chakravorty, FEM Analysis of Progressive Failure for Composite Hypar Shells, Strength of Materials – Springer, 52(4), 507-520, 2020.

7. Biosketch:

Dr. Arghya Ghosh is working as an Assistant Professor in the Civil Engineering Department at NSUT (West Campus), New Delhi. Dr. Ghosh completed his B.E. (Civil Engineering), M.E. (Civil Engineering) with specialization in Structural Engineering and Ph.D. (Engineering) from Jadavpur University, Kolkata in 2011, 2013 and 2019 respectively. He has more than 8 years teaching (as guest/visiting faculty) and research experiences. His research area includes failure of laminated composite plates and shells, finite element method, geometric nonlinearity, stability of civil engineering structures, static and dynamic analyses of advanced structural materials. He has published articles in various international journals and conferences and book chapters.

4.18 Dr. Mahadev Patil

1. Designation, Qualifications:

Visiting Professor (Civil Engineering), Ph.D.

2. **Areas of Interest:** Surveying and investigation, Designing Dams and canals, canal structures, Estimating costing, Trending, Execution and Management

3. **E-mail:** mahadeopatil@nsut.ac.in

4. **Phone:** (+91) 9922259806

5. **Home Page:**



6. Selected Publications:

7. Biosketch:

Prof. Mahadev Patil is a Graduate with Diploma in Civil Engineering. He obtained his Masters in Irrigation Water Management from IIT, Roorkee and Ph.D in River Basin Water Resources planning, Development and Management from IIT, Roorkee. He is a graduate in Law(LL.B.) from BAMU, Aurangabad in Maharashtra State and Masters in Business Administration [MBACHRM] from YCOU, Nashik, Maharashtra State, Also Diploma in Water and Management from WALMI, Aurangabad, Maharashtra. He obtained Masters in Government (MPG) from MIT, School of Government, Kothrud, Pune, Maharashtra, a one year full time masters course in Politics, Media and NGOs. He received the Merit Scholar Award in High school.

He has over 26 years of Experience with Government of Maharashtra State, Water Resources Department, formerly Irrigation Department, as a professional Civil Engineer in Surveying and investigation, Designing Dams and canals, canal structures, Estimating costing, Trending, Execution and Management of more than one hundred Irrigation Projects. After completion of his Ph.D. Degree from IIT, Roorkee he has over 15 years of Experience as Principal/Director in various Engineering College in Maharashtra State. As a Principal in Engineering College, he has established a new Engineering College, started many Graduate and postGraduate Degree courses in Maharashtra State Engineering Colleges. He has published and presented his research papers in International and National level conferences. He has traveled for conferences and study tours in the USA, England, France, Netherlands, Switzerland, Belgium, Thailand, Malaysia, Vietnam and Singapore. He contested the General Lok-sabha Election in 2009 as an Independent Candidate from Mathalok-sabha constituency and Osmanabad Lok-sabha constituency in Maharashtra State. He was associated with Maharashtra State, Chief Minister Hon. Devendra Phadnis as Mukhya Mantri Mitra during 2016-2019. His area of interest is “Inter-linking of Rivers in India Project”.

5. Civil Engineering Laboratories

The Department is currently headed by Prof. Athar Hussain. The department has the following well equipped laboratories which provide practical instruction to undergraduate students and facilities for post-

graduate training, research work and consultancy work. The following laboratories are there in the department:

1. **Structural Analysis Lab** : Universal Testing Machine, Loading Frame, Two & Three Hinged Arches, Apparatus for Reciprocal Theorem, Portable Two hinged parabolic Arch apparatus, Needle beam apparatus for Maxwell reciprocal Theorem, Redundant Joint Apparatus, Load Shell
2. **Applied mechanics lab**: Variable Force Apparatus, Flywheel Apparatus, Link Polygon Apparatus without Weights, Universal Force Table (Superior) with Brass Slotted Weights & Brass Pulleys, Parallelogram of Forces Apparatus, Parallel Forces Apparatus (Tubular Spring Balance) with weight, Parallel Forces Apparatus Overhand Beam type, Apparatus for Reaction of Forces in Beam Dial Type Balance with Weights
3. **Engineering Geology Lab**: Mineral Specimens, Igneous Rock specimens, Sedimentary Rock specimens, Mineral Slides, Rock Slides, Structural Models, Hardness Box, Wooden Specimen Trays, Geological Maps, Topo sheets
4. **Environmental Engineering Lab**: UV Vis Spectro- photo meter, BOD Incubator Shaker, Flocculator Alum Jar Test Apparatus, Laminar Airflow Cabinet, Turbidity Meter, Flame Photometer, Conductivity Meter, Dissolved Oxygen (DO) Meter, Air Samplers, Sound Level Meter, Muffle furnace, Automatic Absorption SpectroPhotometer, Ion Selective Electrode, COD Apparatus, Bacteriological Incubator, Laminar Air Flow cabinet, COD digester, High Volume sampler, Air Samplers, BOD Incubators, Ion Analyzers, multiparameters, SPM and RSPM analysers, Weather Monitoring Station
5. **Fluid Mechanics & Hydraulics Mechanics Lab**: Flow tracker, Acoustic Doppler Velocity Meter, Automatic Water Level Recorder, Echo Depth Sounder. Pipe friction apparatus, Venturimeter apparatus, Nozzle meter apparatus, Reynolds' apparatus, Hydraulic Bench with Level Indicator, Bend Meter, Hydrology Apparatus, Impact of jet apparatus, Rota Meter, Free Vortex and Forced Vortex apparatus, Large tilting Experimental flumes, Pitot Tube Apparatus for Velocity Distribution, Impact of Jet Apparatus, Metacentric Height Apparatus, Centrifugal Pump Test rig
6. **Geoinformatics and Surveying Lab**: Electronic total stations, Micro-optic theodolites, Differential Geographical Positioning System, Auto levels, WILD T2 and T3 Theodolite, Stereoscope, Digital Theodolite, Tripods, Plane tables.
7. **Cement and Material Testing Lab**: Cube casting moulds, Computerized Universal Testing Machine (UTM) of Cap-1000 kN, Compression Testing Machine (2000 tonne), concrete tester, Compaction Factor Test

apparatus, Concrete Flow Table, Slump test apparatus, Briquette testing machines, Air permeability apparatus, Vicat's needle apparatus, Le-Chatelier apparatus, Drum Mixer, Marsh Cone Apparatus, Cement Autoclave, Accelerated Curing Tank, cement testing apparatuses, Digital Hot Air Oven Cement Tensile Testing Machine, Heat of Hydration Apparatus, Vee Bee consistometer, Concrete mixer, Hot Air Oven, cement Tensile Testing Machine, water Bath

8. **Design Lab** : Design software as AUTO - CAD and STAAD – PRO used for building design
9. **Soil Mechanics Lab**: Unconfined Compression Test Apparatus, Sieves And Sieve Shaker, Hydrometer, Vane Shear Test Apparatus, Direct shear Test Apparatus, Large Shear Box, Test Setup, Digi Triaxial Test Setup, Gang Consolidometer, Consolidation Test Apparatus , Standard And Modified Proctor Test Setup, Swell Test Apparatus, Plate Load Apparatus, Universal Permeameter, California Bearing Ratio Test Apparatus, Core Cutter And Soil Sample Extractor, SPT Test Set Up, Water Bath
10. **Transportation Engineering Lab**: Aggregate Impact Testing Machine, Los Angeles Abrasion Machine, California Bearing Ratio Test apparatus, Marshall Stability Testing Machine, Benkelman Beam Apparatus, Roughometer, Softening Point Apparatus, Ductility test apparatus, Merlin Cycle AIM-570, Bitumen Centrifuge Extractor, Dynamic Cone, Penetrometer apparatus.
11. **Survey Lab**: Telescopic Alidade, Brunton Compass, Chains, Tapes, Arrows Pegs, Dumpy levels, Digital levels, Plane tables, Engineers Compass, Mirror Stereoscope, Staff Stands, Ranging Rods, ranging rod stand, Curve Set, Substance Bar, Spanner set, Line Ranger, Optical Square, Indian Optical square, Box Sextant, Adjustable Cross Staff, Cross Staff, Indian Pattern Clinometer, Pentagraph, Spirit Level, Magnetic Needle, Pedometer, Abney Level, Alidate, parallax Bar, Staff Stands, Ranging Rod Stand, Theodolite, Total Station, Auto Level, Digital Planimeter, Prismatic Compass.

6. ELIGIBILITY WITH RESPECT TO BACHELORS & MASTERS DEGREE.

List of Degrees in B. Tech. / B.E./B.Sc. Engg. Considered for admission

1. Civil and Environmental Engineering

2. Civil and Rural Engineering
3. Civil and Water Management Engineering
4. Civil Engineering
5. Civil Engineering and Planning
6. Civil Engineering (Construction Technology)
7. Civil Engineering (Environmental Engineering)
8. Civil and Infrastructure Engineering
9. Civil Engineering (Public Health Engineering)
10. Civil Engineering Environment and Pollution Control
11. Civil Technology
12. Construction Engineering
13. Construction Engineering and Management
14. Construction Technology
15. Construction Technology and Management
16. Building and Construction Technology
17. Energy and Environmental Management
18. Environment Engineering
19. Environmental Engineering
20. Environmental Science and Engineering
21. Environmental Science and Technology
22. Chemical Engineering
23. Geo Informatics
24. Bio Technology

With M. Tech. specialization in any of the branches mentioned below.

1. Civil and Rural Engineering
2. Civil (Public Health and Environment) Engineering
3. Civil Engineering
4. Civil Engineering (Construction Technology)
5. Civil Engineering (Environmental and Pollution Control)
6. Civil Engineering (Environmental Engineering)
7. Civil Engineering (Transportation Engineering)
8. Civil Engineering (Water Management)
9. Civil Environmental Engineering
10. Construction Technology
11. Construction and Project Management
12. Construction Engineering
13. Construction Engineering and Management

14. Construction Management
15. Construction Planning and Management
16. Construction Project Management
17. Construction Technology
18. Construction Technology and Management
19. Energy and Environmental Management
20. Environment and Water Resource Engineering
21. Environmental Biotechnology
22. Environmental Engineering
23. Environmental Engineering and Management
24. Environmental Management
25. Environmental Science and Engineering
26. Environmental Science and Technology
27. Geoinformatics
28. Geoinformatics and Surveying Technology
29. Geotechnical and Geo Environmental Energy
30. Geotechnical Earthquake Engineering
31. Geotechnical Engineering
32. Geotechnology
33. Green Technology
34. Health Science and Water Engineering
35. Highway Engineering
36. Highway Technology
37. Hill Area Development Engineering
38. Hydraulics and Flood Control
39. Hydraulics Engineering
40. Industrial Pollution Control
41. Infrastructure Engineering
42. Infrastructure Engineering and Management
43. Infrastructure Engineering and Technology
44. Infrastructure Management
45. Irrigation and Drainage Engineering
46. Irrigation Engineering
47. Marine Engineering
48. Marine Technology
49. Mineral Exploration
50. Mining Engineering
51. Petroleum Engineering
52. Petroleum Refining and Petrochemicals
53. Petroleum Technology

54. Polymer Engineering
55. Polymer Nanotechnology
56. Remote Sensing
57. Remote Sensing and Wireless Sensor Networks
58. Remote Sensing and GIS
59. Renewable Energy
60. Soil Mechanics
61. Soil Mechanics and Foundation Engineering
62. Solar Power Systems
63. Spatial Information Technology
64. Structural and Foundation Engineering
65. Structural Design
66. Structural Engineering
67. Structural Engineering and Construction
68. Structural Engineering and Construction Management
69. Town and Country Planning
70. Traffic and Transporting Engineering
71. Translational Engineering
72. Transportation Engineering
73. Transportation Engineering and Management
74. WasteWater Management, Health and Safety Engineering
75. Water and Environmental Technology
76. Water Resource Engineering
77. Water Resource Management
78. Water Resources and Hydraulic Engineering
79. Water Resources and Environmental Engineering
80. Water Resources and Hydro Informatics
81. Transportation System Engineering

7. SYLLABUS FOR WRITTEN TEST.

The entrance test shall consist of 100 multiple choice questions. There shall be no negative marking. 50 questions shall be based on Research Aptitude/Methodology which shall include quantitative methods/computer applications, experimental techniques etc. and 50 questions shall be subject specific. The test shall be of Two hours.

Part A Research Aptitude/Methodology:

Unit-1 Research Aptitude

- Research: Meaning, Types, and Characteristics, Positivism and Post-positivistic approach to research.
- Methods of Research: Experimental, Descriptive, Historical, Qualitative and Quantitative methods.
- Steps of Research.
- Thesis and Article writing: Format and styles of referencing.
- Application of ICT in research.
- Research ethics.

Unit-2 Comprehension & Communication

- A passage of text be given. Questions be asked from the passage to be answered.
- Communication: Meaning, types and characteristics of communication.
- Effective communication: Verbal and Non-verbal, Inter-Cultural and group communications, Classroom communication.
- Barriers to effective communication.
- Mass-Media and Society.

Unit-3 Mathematical Reasoning and Aptitude

- Types of reasoning.
- Number series, Letter series, Codes and Relationships.
- Mathematical Aptitude (Fraction, Time & Distance, Ratio, Proportion and Percentage, Profit and Loss, Interest and Discounting, Averages etc.) Unit-VI Logical Reasoning
- Understanding the structure of arguments: argument forms, structure of categorical propositions, Mood and Figure, Formal and Informal fallacies, Uses of language, Connotations and denotations of terms, Classical square of opposition.
- Evaluating and distinguishing deductive and inductive reasoning.
- Analogies.
- Venn diagram: Simple and multiple use for establishing validity of arguments.

Unit-4 Data Interpretation

- Sources, acquisition and classification of Data.
- Quantitative and Qualitative Data.
- Graphical representation (Bar-chart, Histograms, Pie-chart, Table-chart and Line-chart) and mapping of Data.

- Data Interpretation.
- Data and Governance.

Unit-5 Information and Communication Technology (ICT)

- ICT: General abbreviations and terminology.
- Basics of Internet, Intranet, E-mail, Audio and Video-conferencing.
- Digital initiatives in higher education.
- ICT and Governance.

NOTE: (i) Equal number of questions are to be set from each Unit.

(ii) Whenever graphical/pictorial question(s) are set for sighted candidates, a passage followed by equal number of questions and weightage be set for visually impaired candidates.

PART B: Department Specific Subject

Unit 1: Engineering Mathematics

Linear Algebra: Matrix algebra; Systems of linear equations; Eigen values and Eigen vectors.

Calculus: Functions of single variable; Limit, continuity and differentiability; Mean value theorems, local maxima and minima; Taylor series; Evaluation of definite and indefinite integrals, application of definite integral to obtain area and volume; Partial derivatives; Total derivative; Gradient, Divergence and Curl, Vector identities; Directional derivatives; Line, Surface and Volume integrals.

Ordinary Differential Equation (ODE): First order (linear and non-linear) equations; higher order linear equations with constant coefficients; Euler-Cauchy equations; initial and boundary value problems. Partial Differential Equation (PDE): Fourier series; separation of variables; solutions of one dimensional diffusion equation; first and second order one-dimensional wave equation and two dimensional Laplace equation. Probability and Statistics: Sampling theorems; Conditional probability; Descriptive statistics – Mean, median, mode and standard deviation; Random Variables – Discrete and Continuous, Poisson and Normal Distribution; Linear regression. Numerical Methods: Error analysis. Numerical solutions of linear and non-linear algebraic equations; Newton's and Lagrange polynomials; numerical differentiation; Integration by trapezoidal and Simpson's rule; Single and multi-step methods for first order differential equations.

Unit 2: Environmental Engineering

Water and Waste Water Quality and Treatment: Basics of water quality standards – Physical, chemical and biological parameters; Water quality index; Unit processes and operations; Water requirement; Water distribution system; Drinking water treatment.

Sewerage system design, quantity and characteristics of domestic wastewater, primary and secondary treatment. Effluent discharge standards; Sludge disposal; Reuse of treated sewage for different applications.

Air Pollution: Types of pollutants, their sources and impacts, air pollution control, air quality standards, Air quality Index and limits.

Municipal Solid Wastes: Characteristics, generation, collection and transportation of solid wastes, engineered systems for solid waste management (reuse/ recycle, energy recovery, treatment and disposal).

Unit 3: Structures

Engineering Mechanics: System of forces, free-body diagrams, equilibrium equations; Internal

forces in structures; Frictions and its applications; Centre of mass; Free Vibrations of undamped SDOF system.

Solid Mechanics: Bending moment and shear force in statically determinate beams; Simple stress and strain relationships; Simple bending theory, flexural and shear stresses, shear centre; Uniform torsion, Transformation of stress; buckling of column, combined and direct bending stresses.

Structural Analysis: Statically determinate and indeterminate structures by force/ energy methods; Method of superposition; Analysis of trusses, arches, beams, cables and frames; Displacement methods: Slope deflection and moment distribution methods; Influence lines; Stiffness and flexibility methods of structural analysis.

RCC Design: limit states, Characteristic strength and design strength of materials, Characteristic loads, partial safety factor for loads and material strength limits state of collapse in flexure, Design of Beams for Flexure by L.S.M., Design of T-beam and Continuous Beams, Design of Beams for Shear,

Design of One way and Two Way Slabs, Design of Staircases, Design of Columns and Footings, Retaining Wall, Pre-Stressed Concrete.

Construction Materials and Management: Construction Materials: Structural Steel – Composition, material properties and behaviour; Concrete - Constituents, mix design, short-term and long-term properties. Construction Management: Types of construction projects; Project planning and network analysis - PERT and CPM; Cost estimation.

Concrete Structures: Working stress and Limit state design concepts; Design of beams, slabs, columns; Bond and development length; Prestressed concrete beams.

Steel Structures: Working stress and Limit state design concepts; Design of tension and compression members, beams and beam- columns, column bases; Connections - simple and eccentric, beam-column connections, plate girders and trusses; Concept of plastic analysis -beams and frames.

Unit 4: Geotechnical Engineering

Soil Mechanics: Three-phase system and phase relationships, index properties; Unified and Indian standard soil classification system; Permeability - one dimensional flow, Seepage through soils – two - dimensional flow, flow nets, uplift pressure, piping, capillarity, seepage force; Principle of effective stress and quicksand condition; Compaction of soils; One- dimensional consolidation, time rate of consolidation; Shear Strength, Mohr's circle, effective and total shear strength parameters, Stress-Strain characteristics of clays and sand; Stress paths.

Foundation Engineering: Sub-surface investigations - Drilling bore holes, sampling, plate load

test, standard penetration and cone penetration tests; Earth pressure theories - Rankine and Coulomb; Stability of slopes – Finite and infinite slopes, Bishop's method; Stress distribution in soils – Boussinesq's theory; Pressure bulbs, Shallow foundations – Terzaghi's and Meyerhoff's bearing capacity theories, effect of water table; Combined footing and raft foundation; Contact pressure; Settlement analysis in sands and clays; Deep foundations – dynamic and static formulae, Axial load capacity of piles in sands and clays, pile load test, pile under lateral loading, pile group efficiency, negative skin friction.

Unit 5: Surveying and Geoinformatics

Principles of surveying; Errors and their adjustment; Maps - scale, coordinate system; Distance and angle measurement - Levelling and trigonometric levelling; Traversing and triangulation survey; Total station; Horizontal and vertical curves. Photogrammetry and Remote Sensing - Scale, flying height; Basics of remote sensing and GIS.

Unit 6: Water resource Engineering, Hydraulics and Fluid Mechanics

Fluid Mechanics: Properties of fluids, fluid statics; Continuity, momentum and energy equations and their applications; Potential flow, Laminar and turbulent flow; Flow in pipes, pipe networks; Concept of boundary layer and its growth; Concept of lift and drag. Hydraulics: Forces on immersed bodies; Flow measurement in channels and pipes; Dimensional analysis and hydraulic similitude; Channel Hydraulics - Energy-depth relationships, specific energy, critical flow, hydraulic jump, uniform flow, gradually varied flow and water surface profiles. Hydrology: Hydrologic cycle, precipitation, evaporation, evapo-transpiration, watershed, infiltration, unit hydrographs, hydrograph analysis, reservoir capacity, flood estimation and routing, surface runoff models, ground water hydrology - steady state well hydraulics and aquifers; Application of Darcy's Law. Irrigation: Types of irrigation systems and methods; Crop water requirements - Duty, delta, evapotranspiration; Gravity Dams and Spillways; Lined and unlined canals, Design of weirs on permeable foundation; cross drainage structures.

Unit 7: Transportation Engineering

Transportation Infrastructure: Geometric design of highways - cross-sectional elements, sight distances, horizontal and vertical alignments. Geometric design of railway Track - Speed and Cant. Concept of airport runway length, calculations and corrections; taxiway and exit taxiway design. Highway Pavements: Highway materials - desirable properties and tests; Desirable properties of bituminous paving mixes; Design factors for flexible and rigid pavements; Design of flexible and rigid pavement using IRC codes Traffic Engineering: Traffic studies on flow and speed, peak hour factor, accident study, statistical analysis of traffic data; Microscopic and macroscopic parameters of traffic flow, fundamental relationships; Traffic signs; Signal design by Webster's method; Types of intersections; Highway capacity.

6.4.2 DEPARTMENT OF ARCHITECTURE & PLANNING (WEST CAMPUS)

1. The Department

The department was established in 2021 to provide quality education in the field of architecture and planning. The department visualises its growth and development into a leading educational centre and a seat of learning and research in the creative field of ‘architecture’ and ‘physical development’. The department seeks to usher in a renaissance of ‘visual aesthetics’ while keeping pace with the technological innovations and interdisciplinary practices to achieve its stated mission.

2. Courses Offered

The department began following programmes from the academic session July, 2021.

- Five-Year Full-Time Bachelor of Architecture (B.Arch.) programme

3. Areas of Research and Available Vacancies

Presently our faculty is undertaking research in the following broad areas: Architecture, Planning, Urban Design, Architectural Conservation and Landscape Architecture.

3.1 Tentative Seats:

For the session 2022-23 (Even semester) the maximum number of seats in the Department of Architecture and Planning are limited to:

(i) Vacancies with university fellowship: Nil

(ii) Vacancies without university fellowship: Nil

- * University reserves the right to change the number of seats
- * The table below indicates the maximum number of vacancies available in various areas of research.

S. No.	Name of Faculty	Area of Research	No. of candidates to be taken in coming session	
			With Univ. Fellowship	Without Univ. Fellowship
1.	Dr. Santosh Tiwari	Architecture Pedagogy, Sick Building Syndrome	Nil	Nil
2.	Prof. Mukul Singh	Architectural Design	Nil	Nil
3.	Dr. SanyamBahga	Theory of Architecture	Nil	Nil
	Total Vacancy		Nil	Nil

4. Faculty Profile

4.1. Dr. Santosh Tiwari

1. Designation: Head, DAP, Visiting Faculty.

2. E-mail: santosh.tiwari@nsut.ac.in

3. Phone: +91 9897533684

4. Selected Publications:

(i) Tiwari, Santosh. (2013). Developing A Sense of Place by Humanizing Public Pedestrian Precincts. International Journal of Architecture and Urban Development, 3(3 (9)), 21-26.

(ii) Tiwari, Santosh, and Anupama Sharma (2016). SBS - An Architect's Perspective. Journal of International Academic Research for Multidisciplinary, 4(2), 121-131.

(iii) Tiwari, Santosh, and Anupama Sharma (2018). Interrelation of attributes of occupant's comfort, ventilation system and indoor air quality in residential buildings. International Journal of Recent Advances in Multidisciplinary Research, 5(5), 3824-3829.

(iv) Rajput, Yamini, and Santosh Tiwari (2020). Neo-Vernacular Architecture: A Paradigm shift. PalArch's Journal of Archaeology of Egypt/Egyptology, 17(9), 7356-7380.

5. **Bio-Sketch:** Dr Santosh Tiwari has received her B.Arch. from BBDNITM, Lucknow and M.Arch. from Integral University, Lucknow. She received her Ph.D. degree in Architecture from MANIT, Bhopal. She has teaching experience of more than 15 years. Her research focuses on "Sick building syndrome" & "Architectural Pedagogy". She has published papers in more than 20 journals and national & International conferences.



4.2 Prof. Mukul Singh



1. Designation, Qualifications: Professor Emeritus, M.Plan.
2. Areas of Interest: Architectural Design
3. E-mail: mukul.singh@nsut.ac.in
4. Phone: 9997099657
5. Home Page:

7. **Bio-Sketch:** Prof. Mukul Singh has completed his B.Arch. from MANIT-Bhopal and M.Plan. from School of Planning & Architecture, New Delhi. He has teaching experience of more than 40 years.

4.3 Dr. Sanyam Bahga



1. Designation, Qualifications: Assistant Professor, Ph.D.
2. Areas of Interest: History of Architecture, Theory of Architecture, Contemporary Indian Architecture.
3. Email: sanyam@nsut.ac.in
4. Phone: 9876870121
5. Selected Publications:

- a. Bahga, Sanyam, and Gaurav Raheja. "Complexities of Practicing Architectural Regionalism in India: An Interview Study". *Frontiers of Architectural Research*, Vol-9.3; 2020. pp568-578. DOI: [10.1016/j.foar.2020.03.003](https://doi.org/10.1016/j.foar.2020.03.003)
- b. Bahga, Sanyam, and Gaurav Raheja. "A Study of Regional Assertions in the Architecture of Delhi from the 1970s to the present". *Buildings*, Vol-9.5; 2019. 108. DOI: [10.3390/buildings9050108](https://doi.org/10.3390/buildings9050108)
- c. Bahga, Sanyam, and Gaurav Raheja. "An account of Critical Regionalism in diverse building types in postcolonial Indian architecture". *Frontiers of Architectural Research*, Vol-7.4; 2018. pp473-496. DOI: [10.1016/j.foar.2018.09.001](https://doi.org/10.1016/j.foar.2018.09.001)

6. **Bio-Sketch:** Dr Sanyam Bahga received his B.Arch. from Chandigarh College of Architecture (Panjab University) in 2012, and M.Arch. and Ph.D. from IIT-Roorkee in 2014 and 2020, respectively. His research interests include history and theory of architecture, with a focus on contemporary Indian architecture. He has authored three articles in international journals of repute. In addition, he has also worked in architectural firms in India and Switzerland.

6.5 FACULTY OF DESIGN

6.5.1 DEPARTMENT OF DESIGN (MAIN CAMPUS)

1. The Department

The Department of Design, Netaji Subhas University of Technology (formerly Netaji Subhas Institute of Technology) was established with a primary objective of solving the problem of the society at large by way of innovative Design using the latest technology including Virtual Reality, Artificial Intelligence, Information Technology and Mechatronics. The program has been designed and structured in a way so as to adapt itself to the changing needs of the society and industry as a whole.

2. Courses Offered

Currently the Department of Design offers two four year, full time undergraduate programs B.Des in the following areas

1. Bachelor of Design in Product Design BDPD
2. Bachelor of Design in Fashion Technology BDFT .

The Department also has a PhD programme.

3. Areas of Research and Available Seats

- Sustainability for products
- Aesthetics and form perception
- Cognition and perception
- Design pedagogy
- Product packaging
- Application of AI/ML in Design
- User Experience
- Participative Design
- Design for circular economy
- Product Life cycle management
- Strategic design
- Design and culture
- Application of design in software engineering
- Recycling and upcycling in fashion

- Collaborative consumption in fashion design
- Intersection of fashion, dress and image
- Non polluting production processes in fashion industry
- Textile and Apparel design, marketing, merchandising and related fields

3.1 Tentative Seats:

For the Session 2022-2023 (Even Sem) the maximum number of seats in the Ph.D. Programme offered by the Department of Design are limited to

- i Vacancies with university fellowship : 04
- ii Vacancies without university fellowship : NIL

University reserves the right to change the number of seats.

***The Table below indicates the maximum number of vacancies available in various areas of research. However, the total number of seats is as given above**

S. No.	Area of Research	Faculty	No. of candidates to be taken in coming session (January 2021 onwards)	
			With Univ. Fellowship	Without Univ.Fellowship

1.	Application of AI/ML in Design Application of Design in software Engineering	Prof Ritu Sibal	02	00
2	Recycling and upcycling in fashion/Collaborative consumption in fashion design/Intersection of fashion,dress and image/Nonpolluting production processes in fashion industry/Textile and Apparel design, marketing , merchandising and related fields	Prof. K.N. Chatterjee		

4. Faculty Profile

4.1 Prof. Ritu Sibal

1. Designation and Qualifications: HoD Department of Design, PhD

2. Areas of Interest: Design, AI/ML and its application in Design, Application of design in software engineering

3. List of Publications: Three most relevant publications

1 S. Tyagi,R. Sibal and B. Suri,"Empirically developed framework for building trust in distributed agile teams", *Information and Software Technology(Elsevier), SCIE, Volume145,106828,May2022.*

<https://doi.org/10.1016/j.infsof.2022.106828>



2 R. Sharma, R. Sibal and S. Sabharwal, "Software Vulnerability Prioritization using Vulnerability Description" *International Journal of System Assurance Engineering and Management (Springer)*, SCOPUS, July 2020.

<https://doi.org/10.1007/s13198-020-01021-7>

3 S. Tyagi, R. Sibal, B. Suri, B. Wadhwa, and S. Shekhar, "Development of reusable hybrid test automation framework for web based scrum projects," *Journal of Applied Science and Engineering, ESCI, SCOPUS*, vol. 21, pp. 455–462, 2018

[https://doi.org/10.6180/jase.201809_21\(3\).0017](https://doi.org/10.6180/jase.201809_21(3).0017)

4. E-mail: rsb@nsut.ac.in

5. Phone: 9871598390

7. Bio-Sketch: Dr. Ritu Sibal is a Professor and HOD in the Department. She has published over 30 research papers the reputed National and International journals and in the proceedings of National and International Conferences. She has more than 30 years of teaching and research experience and has guided a number of Ph.D Thesis.

4.2 Prof. K. N. Chatterjee

1. Designation and Qualifications: Visiting Faculty (Professor) in the "Department of Design", PhD, M.Tech.B.Tech (Textile).

2. Areas of Interest: Fashion and Apparel Engineering, Textile, Fashion Design, Fashion Accessories & Product Designing, AI, Design Thinking

3. List of Publications: Three most relevant publications



a) Comfort properties of Suiting Fabrics, published in June 2009, *Indian Journal of Fiber and Textile Research* (Impact factor: 0.449), 34(2):122-128.

b) Performance characteristics of filter fabrics in cement dust control: Part IV-Study of nonwoven filter fabrics using factorial design technique published in March 1997, *Indian Journal of Fiber and Textile Research* (Impact factor: 0.449), 22(1):21-29.

c) Performance characteristics of filter fabrics in cement dust control : Part III-Influence of fiber fineness and scrim on the performance of nonwoven filter fabrics published in March 1997, Indian Journal of Fiber and Textile Research (0.449), 22(1):13-20.

4. E-mail: kn.chatterjee@gmail.com

5. Phone: +919255176649

6. Home Page: <https://sites.google.com/view/department-of-design/faculty>

7. Bio-Sketch: Dr. K.N.Chatterjee is a Professor in the Design Department, Netaji Subhas University of Technology, and New Delhi. He has published several research papers in reputed National and International Journals and National Conferences. He has research and teaching experience of 36 years. He has co-guided a number of Ph.D. thesis.

5. FOR ADMISSION TO THE PhD PROGRAMME

Candidates having post graduate degree in Design/ Fashion/ Science / Engineering/ Technology will be considered.

1. SYLLABUS FOR WRITTEN TEST:

The entrance test shall consist of 100 multiple choice questions. There shall be no negative marking. 50 questions shall be based on Research Aptitude/Methodology which shall include quantitative methods/computer applications, experimental techniques etc. and 50 questions shall be subject specific. The test shall be of Two hours.

Part A Research Aptitude/Methodology:

Unit-1 Research Aptitude

- Research: Meaning, Types, and Characteristics, Positivism and Post-positivistic approach to research.
- Methods of Research: Experimental, Descriptive, Historical, Qualitative and Quantitative methods.
- Steps of Research.
- Thesis and Article writing: Format and styles of referencing.
- Application of ICT in research.
- Research ethics.

Unit-2 Comprehension & Communication

- A passage of text be given. Questions be asked from the passage to be answered.
- Communication: Meaning, types and characteristics of communication.
- Effective communication: Verbal and Non-verbal, Inter-Cultural and group communications, Classroom communication.
- Barriers to effective communication.
- Mass-Media and Society.

Unit-3 Mathematical Reasoning and Aptitude

- Types of reasoning.
- Number series, Letter series, Codes and Relationships.
- Mathematical Aptitude (Fraction, Time & Distance, Ratio, Proportion and Percentage, Profit and Loss, Interest and Discounting, Averages etc.) Unit-VI Logical Reasoning
- Understanding the structure of arguments: argument forms, structure of categorical propositions, Mood and Figure, Formal and Informal fallacies, Uses of language, Connotations and denotations of terms, Classical square of opposition.
- Evaluating and distinguishing deductive and inductive reasoning.
- Analogies.
- Venn diagram: Simple and multiple use for establishing validity of arguments.

Unit-4 Data Interpretation

- Sources, acquisition and classification of Data.
- Quantitative and Qualitative Data.
- Graphical representation (Bar-chart, Histograms, Pie-chart, Table-chart and Line-chart) and mapping of Data.
- Data Interpretation.
- Data and Governance.

Unit-5 Information and Communication Technology (ICT)

- ICT: General abbreviations and terminology.
- Basics of Internet, Intranet, E-mail, Audio and Video-conferencing.
- Digital initiatives in higher education.
- ICT and Governance.

NOTE: (i) Equal number of questions are to be set from each Unit.

(ii) Whenever graphical/pictorial question(s) are set for sighted candidates, a passage followed by equal number of questions and weightage be set for visually impaired candidates.

Part B: Department Specific Subject:

UNIT I

Fundamentals of Design: Elements of Design - shape, color, space, form, line, value, and texture and their applications in Design. Principles of Design. Design Process - various steps in design. Design Thinking - Concepts and stages.

UNIT II

Software tools for Design - Adobe Photoshop, Illustrator, Infinite Design, Coreldraw, Canva, Inkscape, Adobe Express. Application of above tools in design.

UNIT III

Materials and Processes - Characteristics and properties of materials, sourcing of materials, types of materials - fabrics, polymers, metals, glass, clay, foam and gels etc. Manufacturing processes for different materials.

UNIT IV

Product Marketing and Merchandising - Concepts of Marketing, Digital Marketing, E-commerce, Brand Management, Merchandising concepts, Supply Chain and Logistics, Retail Management, Customer Buying behaviour.

UNIT V

Entrepreneurship and Project Management - Types of businesses, Regulatory environment, Export Management, Labour Laws, Financial Planning and Management, IPR and Patents.

6.6 FACULTY OF SCIENCES

6.6.1 DEPARTMENT OF MATHEMATICS (MAIN AND EAST CAMPUS)

1.The Department

The Department of Mathematics, Netaji Subhas University of Technology (formerly Netaji Subhas Institute of Technology) was established in the year 1983. All through its sparkling history of 38 years, the Department of Mathematics has been known for its excellent Research programs.

The Department has always been on a progressive path due to its experienced and dedicated faculty members who have a strong commitment towards providing quality Mathematics education and research. The Department has **Eleven** faculty members, 04 Professors, 01 Associate Professor, 05 Assistant Professor, 01 Visiting Professor and all the faculty members are holding Doctoral degree except one.

2.Courses Offered

The Department also offers high quality research programs at the doctoral level.

3.Areas of Research and Available Vacancies

The areas of research are listed below:

- General Relativity and Cosmology, Astrophysics
- Approximation Theory
- Linear positive operators, convergence estimates, applications of q-calculus in approximation theory, difference estimates etc.
- Gas dynamics, Non Linear Waves
- Biomechanics, Fluid Mechanics
- Complex Analysis
- Portfolio optimization (Optimization in finance)
- Stochastic Processes, Queueing Models
- Numerical Analysis

3.1 Tentative Seats:

For the Session 2022-2023 Even sem the maximum number of seats in the Ph.D. Programme offered by the Department of Mathematics are limited to

- i) Vacancies with university fellowship : 01**

ii) Vacancies without university fellowship: Nil

University reserves the right to change the number of seats.

***The table below indicates the maximum number of vacancies available in various areas of research. However, the total number of seats are as given above.**

S. No.	Area of Research	Faculty	No. of candidates to be taken in coming session	
			With Univ. Fellowship	Without Univ. Fellowship
1.	General Relativity and Cosmology, Astrophysics	Prof. J. K. Singh	01	Nil
2.	Approximation Theory	Prof. Vijay Gupta	Nil	Nil
3.	Complex Analysis	Dr. Niraj Kumar	Nil	Nil
4.	General Relativity and Cosmology	Prof. G. K. Goswami	Nil	Nil
5.	Biomechanics, Fluid Mechanics	Prof. J. K. Misra	Nil	Nil
6.	Biomechanics, Fluid Mechanics	Dr. M. Misra	Nil	Nil
7.	Portfolio optimization (Optimization in finance)	Dr. Amita Sharma	Nil	Nil

8.	Stochastic Processes, Queueing Models	Dr. Anupam Gautam	Nil	Nil
9.	Numerical Analysis	Dr. Sachin Sharma	Nil	Nil

4. Faculty Profile

4.1 Dr. J. K. Singh



1. Designation, Qualifications: Professor, M. Sc., Ph.D

2. Areas of Interest: General Relativity and Cosmology, Astrophysics

3. List of Publications:

- a. **Singh, J. K.**, Nagpal, R. and S. K. J. Pacif, *Statefinder diagnostic for modified Chaplygin gas cosmology in $f(R,T)$ gravity with particle creation*, International Journal of Geometric Methods in Modern Physics, **15**, 1850049 (2018). doi.org/10.1142/S0219887818500494
- b. **Singh, J. K.**, Nagpal, R., *FLRW cosmology with EDSFD parametrization*, Eur. Phys. J. C. **80**, 295 (2020).
- c. **Singh, J. K.**, Bamba, K., Nagpal, R. and S. K. J. Pacif, *Bouncing cosmology in $f(R,T)$ gravity*, Phys. Rev. D **97**, 123536 (2018). doi.org/10.1103/PhysRevD.97.123536

4. E-mail: jksingh@nsut.ac.in,

5. Phone: 9205475013

6. Home Page: <http://www.nsit.ac.in/faculty/jks/>

7. Bio-Sketch:

Dr. J. K. Singh is Professor, NSUT, New Delhi. His area of expertise is to study of spatially homogeneous, isotropic and totally anisotropic cosmological models in General Theory of Relativity as well as alternative theories of gravity with observational constraints. Currently, He is working on inhomogeneous space-times and cyclic universe using various observational constraints and numerical techniques. He has completed his M.Sc. (Mathematics) in 1987 from University of Allahabad and Ph.D. in 1996 from IIT (BHU), Varanasi. He has 23 years teaching experience in Mathematics and 28 years research experience in General Theory of Relativity and Cosmology. He has published 48 research papers in the journals of national as well as international repute. He has presented

various research papers, delivered various invited talks, Chaired various sessions in national as well as international conferences. Currently, he is the Head, Department of Mathematics. He has also performed various administrative responsibilities at NSIT such as, Dy. Supdt. and Supdt., Theory Examination; Member, BE admission committee; Coordinator, Dept. of Mathematics and Officer-in Charge of CM Lab I&II.

4.2 Dr. Vijay Gupta

1.Designation, Qualifications: Professor, Ph.D.

2.Areas of Interest: Approximation Theory

3.List of Publications:

4. Three recent publications:

- a. **Vijay Gupta**, Convergence of exponential operators connected with x^3 on functions of BV, Miskolc Math Notes 22(2) (2021), 681-686. DOI: 10.18514/MMN.2021.3610
- b. **Vijay Gupta**, Higher order Lupas-Kantorovich operators and finite differences, R RACSAM 115, 100 (2021).<https://doi.org/10.1007/s13398-021-01034-2>
- c. **Vijay Gupta**, Ali Aral, Carmen Muraru, Modification of exponential type operators preserving exponential functions connected with x^3 , Mediterr. J. Math. (2021) 18:222. <https://doi.org/10.1007/s00009-021-01851-0>

4.E-mail: vijaygupta2001@hotmail.com

5.Phone: 011-25099006, 9910121172

6.Home Page: <http://nsit.ac.in/faculty/vg/>

7. **Bio-Sketch:** Dr. Vijay Gupta is a Professor of Mathematics at Netaji Subhas University of Technology (formerly Netaji Subhas Institute of Technology), New Delhi. Dr. Gupta has guided eight Ph.D. students. He has published more than 340 research papers in reputed International Journals, he has co-authored five research monographs and edited four volumes. Currently, he is actively associated editorially with several international scientific research journals. The present h-index is 42.



4.3 Prof. J. K. Misra

1. Designation, Qualifications: Professor, Ph.D
2. **Areas of Interest:** Biomechanics, Fluid Mechanics

3. List of Publications:

- a. P. SINGH, J. K. MISRA and K. A. NARAYAN, Free Convection Along a Vertical Wall in a Porous Medium with Periodic Permeability Variation, Int. Journal for Numerical and Analytical methods in Geomechanics. Vol. 13, 1989, pp.443-450.
- b. J. K. MISRA and R S CHAUHAN, A study of Pulsatile Blood Flow in a tube with Pulsating walls, Acta Physica Hungarica Vol. 67 (1-2) 1990 pp. 123-134.
- c. A. K. SINGH and J. K. MISRA, Natural Convection Adjacent to a Vertical Wall in a Saturated Porous Medium with Variable Surface Temperature, Indian Journal of Technology, Vol. 30, 1992, pp.392-396

4. **E-mail:** misrajkg@gmail.com

5. **Phone:** 9205475003

6. **Home Page:** <http://www.nsit.ac.in/faculty/jkm/>

7. Bio-Sketch:

Dr J K Misra is a Professor at NSIT, Delhi. His areas of interest include Bio-mechanics and Heat Transfer in Porous media. Dr Misra has completed his M.Sc. (Mathematics) in 1979 and Ph.D in 1984 from H.B.T.I Kanpur. He has done his post doctoral research work as a Research Associate and Research Scientist at IIT Kanpur. He has 25 years teaching experience in subjects related to Engineering Mathematics and Computer Programming. He has published a dozen research papers in journals of national and international repute. He has also performed various administrative responsibilities at NSIT, Delhi such as Warden of boys hostel, Academic Coordinator, Coordinator CEP and SCP programme, Time-table In-Charge, Vigilance Officer, Chairman BE admission committee and Proctor.



4.4 Dr. Mamta Misra

1. Designation, Qualifications: Associate Professor, Ph.D

2. Areas of Interest: Biomechanics, Fluid Mechanics

3. List of Publications:



- a. **MamtaMisra**, Naseem Ahmad and Zakawat Ullah Siddiqui. “Unsteady boundary layer flow past a stretching plate and heat transfer with variable thermal conductivity”, *World Journal of Mechanics*, Vol, 2, 2012, 35-41.
- b. Rekha Bali, Swati Mishra and **MamtaMisra**, Effect of Deformation of Red Cell on Nutritional transport in Capillary-Tissue Exchange System” *Applied Mathematics*, Vol 2,2011, 1417-1423
- c. Naseem Ahmad and **MamtaMisra** “Visco-elastic flow through porous medium bounded by oscillating plate in a slip regime” *The Aligarh Bulletin of Mathematics*, Vol. 22, No. 2, 2003, 99-105

4. E-mail: mmishra@nsit.ac.in, mamtansit@yahoo.co.in

5. Phone: 9810751266

6. Home Page:<http://www.nsit.ac.in/faculty/mm/>

7. Bio-Sketch:

Dr. MamtaMisra is an Associate Professor in the Mathematics Department at Netaji Subhas Institute of Technology. Dr. MamtaMisra a Ph.D from Harcourt Butler Technological Institute, Kanpur has published several papers in the National and International Journals of Repute.

4.5 Dr. Niraj Kumar

1. Designation, Qualifications: Assistant Professor, Ph.D
2. Areas of Interest: Complex Analysis
3. List of Publications:
 - a. **Niraj Kumar**, Garima Manocha, “Study of the Jacobson radical for a certain class of entire Dirichlet series” *Scientia Magna* , Volume 12, Issue 1, 2017, Pages 23-31.
 - b. **Niraj Kumar**, Garima Manocha, “On a class of entire functions represented by Dirichlet series”, *Journal of the Egyptian Mathematical Society*, Volume 21, Issue 1, April 2013, Pages 21-24.
 - c. **Niraj Kumar**, Garima Manocha, “A Class of Entire Dirichlet Series as an FK-Space and a Frechet Space”, *Acta Mathematica*



Scientia, 2013, Volume 33B, IssuePages 1571–1578.

4. **E-Mail:** neeraj.kumar@nsut.ac.in

5. **Phone:** 9350589964

6. **Home Page:** <http://www.nsit.ac.in/faculty/hp/>

7. **Bio-Sketch:** Dr. Niraj Kumar is an Assistant Professor at the Department of Mathematics, Netaji Subhas University of Technology (formerly Netaji Subhas Institute of Technology), New Delhi. He has published more than 25 research papers in reputed International Journals, Proceedings of International and National Conferences. He has guided two Ph.D thesis. His doctoral students have won prizes at various prestigious conferences. Two of his students Lakshika Chutani and Garima Manocha have won Best Poster Award at the Indian Science Congress in the year 2016 and 2015 respectively and were also awarded V.M. Shah prize at the Annual Conference of Indian Mathematical Society in the year 2015 and 2014 respectively. They both also got nominated for the ISCA Young Scientist's Award Programme for the year 2016 and 2018 respectively. Another student Nibha Dua was awarded the Best Paper Award at the conference organized by Calcutta Mathematical Society in 2018.

4.6 Dr. G. K. Goswami

1. **Designation, Qualifications:** Visiting Professor, Ph.D

2. **Areas of Interest:** General Relativity and Cosmology, Astrophysics

3. **List of Publications:**

- (i) Anil Kumar Yadav, A. M. Alshehri, Nafis Ahmad, **G. K. Goswami** and Mukesh Kumar: Transitioning universe with hybrid scalar field in Bianchi I space-time, *Physics of the Dark Universe*(Elsevier), 31 (2020) 100738
- (ii) Rajendra Prasad, Lalit Kumar Gupta, **G. K. Goswami** and Anil Kumar Yadav: Bulk viscous accelerating universe in $f(R,T)$ theory of gravity. *Pramana-J. Phy.* [https://doi.org/10.1007/s12043-020-02003-x\(2020\)](https://doi.org/10.1007/s12043-020-02003-x(2020))
- (iii) **G. K. Goswami**, Anil Kumar Yadav and B. Mishra: Probing kinematics and fate of Bianchi type V universe. *Modern Physics Letters A* , 2050224 (2020), <https://doi.org/10.1142/S0217732320502247>



4. Email: ggoswami@nsut.ac.in gk.goswami9@gmail.com

5. web link: http://arxiv.org/a/goswami_g_1,
http://researchgate.net/profile/G_Goswami

6. **Bio-Sketch:** Currently, Dr. G. K. Goswami is a visiting professor at the department of mathematics, Netaji Subhas University of Technology, New Delhi, India. His research activities span to the area of Cosmology, Gravitation and dark energy in curve space times. Cosmology is the study of the Universe in large. During the present century, a large number of observational results reveal the overall regularities, which are global rather than local. The basic purpose of the cosmological studies is to construct a coherent picture of the Universe based on these data and build up theoretical models which fit them best and tell us about the past and future of the Universe. His previous and current work deals with a number of cosmological models, which might be of interest in studying the early Universe. His interest is also to study the analytical and physical properties of dark energy and dark matter especially with the recent indications that the cosmic expansion is accelerating and the cosmological constant does not vanish. He started his research as UGC junior and senior fellow during 1975-1981 and continued it during his assignment as college lecturer from 1981 till now. His total **research experience** is 44 yrs. He joined Kalyan PG College, Bhilai Nagar (C. G.) as lecturer in Mathematics Department on 22-08-1983 and got retired as Prof. and Head on 31st Dec 2018. He was facilitated with best teacher award. In the year 2015 by Chhattisgarh State Govt. He has an experience in teaching U. G. courses for 36 years and P. G. courses for 30 years. He has 35 research papers to his credit which are published in international sci journals of high repute. He is also a reviewer of these journals. A total of 4 research scholars have been awarded Ph.D. degree under his guidance and he has also supervised 29 M. Phil students from Periyar, Vinayak and Raman Universities for their projects under distant Education. He is regular visitor of IUCAA, Pune and life member of IAGRG.

4.7 Dr.Amita Sharma

1. **Designation, Qualifications:** Assistant Professor, Ph. D
2. **Areas of Interest:** Portfolio Optimization

3. List of Publications:

- a. Goel, A. and **Sharma, A.** (2020). Mixed Value-at-Risk and its numerical investigation, Physica A: Statistical Mechanics and its Applications, 541.
- b. Goel, A., **Sharma, A.** and Mehra, A. (2019). Robust optimization of mixed CVaR STARR ratio using copulas, Journal of Computational and Applied Mathematics, 347, 62-83.



- c. Goel, A., **Sharma, A.** and Mehra, A. (2018). Index tracking and enhanced indexing using mixed conditional value-at-risk, *Journal of Computational and Applied Mathematics*, 335, 361–380.
- d. **Sharma, A.**, Utz, S., and Mehra, A. (2017). Omega-CVaR portfolio optimization and its worst case analysis, *OR Spectrum*, 39(2), 505–539.
- e. **Sharma, A.** and Mehra, A. (2017). Financial analysis based sectoral portfolio optimization under second order stochastic dominance, *Annals of Operational Research*, 256(1), 171–197.
4. **E-Mail:** amita.sharma@nsut.ac.in
5. **Phone:** 9990690357
6. **Home Page:** Under construction

7. Bio-Sketch: Dr. Amita Sharma is an Assistant professor at the Department of Mathematics, Netaji Subhas University of Technology, New Delhi. Dr. Amita has completed her doctoral titled “Optimal Portfolio Selection Contemplating Risk Propensity of Investors in Stock Markets”, in 2016 from the Department of Mathematics, Indian Institute of Technology Delhi followed by the M.Sc. and M.Phil from the Department of Operational research, Delhi University. Her Ph.D has been funded by Council of Scientific and Industrial Research (INDIA) for five years. Her research in IIT Delhi focused on Portfolio Optimization where the aim was to construct optimal portfolios of financial instruments by building different optimization models based on investor’s behaviour towards reward and risk in investment. The performance of the optimal portfolios obtained on solving these optimization models is tested quantitatively and statistically on real market data. Over the several years, she encountered with several intriguing topics of investment science and now possess a good knowledge in the area of mean-risk modeling, second order stochastic dominance, robust optimization, fundamental/technical analysis, behavior finance among others. She uses the software GAMS, LINGO, MATLAB, R, and Excel spreadsheet for computational analysis.

Prior joining the NSUT, Dr. Sharma has worked with the Indian Institute of Information Technology Guwahati for four years from 2016 to 2020 as an Assistant Professor in the Department of Science and Mathematics. During her tenure at IIIT- Guwahati, she explored various applications of machine learning tools in the area of finance with the project students. Till now, she has total 9 research papers published in international SCI indexed journals to her credit.

4.8 Dr.AnupamGautam

1. **Designation, Qualifications:** Assistant Professor, Ph.D
2. **Areas of Interest:** Stochastic Processes, Queueing Models
3. **List of Publications:**



- a. **Anupam Gautam**, S. Dharmaraja, An Analytical Model Driven by FluidQueue for Battery Life Time of a User Equipment in LTE-A Networks, *Physical Communication*, 30, pp. 213-219, 2018.
 - b. **Anupam Gautam**, Gautam Chuadhary, S. Dharmaraja, Performance Analysis of DRX Mechanism Using Batch Arrival Vacation Queueing System with N-Policy in LTE-A Networks, *Annals of Telecommunications*, 75, pp. 353 -367, 2020.
 - c. Garima Mishra, **Anupam Gautam**, S. Dharmaraja, Subrat Kar, Signaling Packet Aggregation and Compression in SIP Network: Modeling and Performance Evaluation, *Wireless Personal Communications*, 110(2), pp.651-676, 2020.
4. **E-mail:**anupam.gautam@nsut.ac.in,
 5. **Phone:**9650082133
 6. **Web link:** Under Construction

7. Bio-Sketch: Dr.Anupam Gautam is an assistant professor at the department of mathematics, Netaji Subhas University of Technology (NSUT), Delhi. She has two years of teaching and 8 years of research experience. She has earned her Ph.D. degree in Mathematics from the department of mathematics, Indian Institute of Technology Delhi in 2018. Prior to that, she has completed her B.Sc. and M.Sc. degrees in Mathematics from Miranda House, University of Delhi. She has Qualified CSIR- NET(JRF) examination with AIR -92 in 2012. Her research interests include application of queueing theory, stochastic modelling and performance analysis of communication systems. Primarily, she works on modelling and analysis of future generation mobile communication networks.

4.9 Dr. Sachin Sharma

1. **Designation, Qualifications:** Assistant Professor, Ph.D.
2. **Areas of Interest:** Numerical Analysis
3. **List of Publications:**



a. R. K. Mohanty and **Sachin Sharma**, Fourth-order numerical scheme based on half-step non-polynomial spline approximations for 1D quasi-linear parabolic equations, Numerical Analysis and Applications, 13(1), 68-81 (2020).

b. R. K. Mohnaty and **Sachin Sharma**, A new high-accuracy method based on off-step cubicpolynomial approximations for the solution of coupled Burgers' equations and Burgers-Huxleyequation, Engineering with Computers, <https://doi.org/10.1007/s00366-020-00982-4>(2020).

c. R.K. Mohanty and **Sachin Sharma**, A high-resolution method based on off-step non-polynomial spline approximations for the solution of Burgers-Fisher and coupled nonlinearBurgers' equations, Engineering Computations, 37(8), 2785-2818 (2020).

4. E-Mail: sachin.sharma@nsut.ac.in

5. Phone: 08840510412

6. Home Page: Under construction

7. Bio-Sketch: Dr. Sachin Sharma is an Assistant Professor at the Department of Mathematics, Netaji Subhas University of Technology (formerly Netaji Subhas Institute of Technology), New Delhi. He obtained his M.Sc.(Mathematics) degree from Indian Institute of Technology, Kanpur. He obtained his M.Phil.(Mathematics)& Ph.D.(Mathematics) degrees from Department of Mathematics, University of Delhi. He also qualified CSIR-NET(JRF)-2011 and GATE-2010 in Mathematics. He has 5 years teaching experience in Mathematics and 10years research experience in Numerical Analysis. He has published 10 research papers in reputed peer reviewed International and National Journals. He has presented various research papers in national as well as international conferences. His research interest includes the numerical techniques based on finite difference methods for second and fourth order partial differential equations.

5. Laboratory Infrastructure

Department of Mathematics has two laboratories as CM Lab-1 and CM Lab-2, which are managed by a Faculty-in-Charge and a staff-in-charge.

6.ELIGIBILITY WITH RESPECT TO BACHELORS & MASTERS DEGREE.

M. Sc. in Mathematics or Equivalent.

7.SYLLABUS FOR WRITTEN TEST.

The entrance test shall consist of 100 multiple choice questions. There shall be no negative marking. 50 questions shall be based on Research Aptitude/Methodology which shall include quantitative methods/computer applications, experimental techniques etc. and 50 questions shall be subject specific. The test shall be of Two hours.

Part A Research Aptitude/Methodology:

Unit-1 Research Aptitude

- Research: Meaning, Types, and Characteristics, Positivism and Post-positivistic approach to research.
- Methods of Research: Experimental, Descriptive, Historical, Qualitative and Quantitative methods.
- Steps of Research.
- Thesis and Article writing: Format and styles of referencing.
- Application of ICT in research.
- Research ethics.

Unit-2 Comprehension & Communication

- A passage of text be given. Questions be asked from the passage to be answered.
- Communication: Meaning, types and characteristics of communication.
- Effective communication: Verbal and Non-verbal, Inter-Cultural and group communications, Classroom communication.
- Barriers to effective communication.
- Mass-Media and Society.

Unit-3 Mathematical Reasoning and Aptitude

- Types of reasoning.
- Number series, Letter series, Codes and Relationships.
- Mathematical Aptitude (Fraction, Time & Distance, Ratio, Proportion and Percentage, Profit and Loss, Interest and Discounting, Averages etc.) Unit-VI Logical Reasoning
- Understanding the structure of arguments: argument forms, structure of categorical propositions, Mood and Figure, Formal and Informal

fallacies, Uses of language, Connotations and denotations of terms, Classical square of opposition.

- Evaluating and distinguishing deductive and inductive reasoning.
- Analogies.
- Venn diagram: Simple and multiple use for establishing validity of arguments.

Unit-4 Data Interpretation

- Sources, acquisition and classification of Data.
- Quantitative and Qualitative Data.
- Graphical representation (Bar-chart, Histograms, Pie-chart, Table-chart and Line-chart) and mapping of Data.
- Data Interpretation.
- Data and Governance.

Unit-5 Information and Communication Technology (ICT)

- ICT: General abbreviations and terminology.
- Basics of Internet, Intranet, E-mail, Audio and Video-conferencing.
- Digital initiatives in higher education.
- ICT and Governance.

NOTE: (i) Equal number of questions are to be set from each Unit.

(ii) Whenever graphical/pictorial question(s) are set for sighted candidates, a passage followed by equal number of questions and weightage be set for visually impaired candidates.

Part B: Department Specific Subject:

Department of Mathematics

UNIT 1

Analysis: Elementary set theory, finite, countable and uncountable sets, Real number system as a complete ordered field, Archimedean property, supremum, infimum. Sequences and series, convergence, limsup, liminf. Bolzano Weierstrass theorem, Heine Borel theorem. Continuity, uniform continuity, differentiability, mean value theorem. Sequences and series of functions, uniform convergence. Riemann sums and Riemann integral, Improper Integrals. Monotonic functions, types of discontinuity, functions of bounded variation, Lebesgue measure, Lebesgue integral. Functions of several variables, directional derivative, partial derivative, derivative as a linear transformation, inverse and implicit function theorems. Metric spaces, compactness, connectedness. Normed linear Spaces. Spaces of continuous functions as examples.

Linear Algebra: Vector spaces, subspaces, linear dependence, basis, dimension, algebra of linear transformations. Algebra of matrices, rank and determinant of matrices, linear equations. Eigenvalues and eigenvectors, Cayley-Hamilton theorem. Matrix representation of linear transformations. Change of basis, canonical forms, diagonal forms, triangular forms, Jordan forms. Inner product spaces, orthonormal basis. Quadratic forms, reduction and classification of quadratic forms. Contour integral, Cauchy's theorem, Cauchy's integral formula, Liouville's theorem, Maximum modulus principle, Schwarz lemma, Open mapping theorem. Taylor series, Laurent series, calculus of residues. Conformal mappings, Mobius transformations.

Algebra: Permutations, combinations, pigeon-hole principle, inclusion-exclusion principle, derangements. Fundamental theorem of arithmetic, divisibility in \mathbb{Z} , congruences, Chinese Remainder Theorem, Euler's ϕ -function, primitive roots.

Groups, subgroups, normal subgroups, quotient groups, homomorphisms, cyclic groups, permutation groups, Cayley's theorem, class equations, Sylow theorems.

Rings, ideals, prime and maximal ideals, quotient rings, unique factorization domain, principal ideal domain, Euclidean domain. Polynomial rings and irreducibility criteria. Fields, finite fields, field extensions, Galois Theory.

Topology: basis, dense sets, subspace and product topology, separation axioms, connectedness and compactness.

UNIT 2

Complex Analysis: Algebra of complex numbers, the complex plane, polynomials, power series, transcendental functions such as exponential, trigonometric and hyperbolic functions. Analytic functions, Cauchy-Riemann equations.

UNIT 3

Ordinary Differential Equations (ODEs): Existence and uniqueness of solutions of initial value problems for first order ordinary differential equations, singular solutions of first order ODEs, system of first order ODEs. General theory of homogenous and non-homogeneous linear ODEs, variation of parameters, Sturm-Liouville boundary value problem, Green's function.

Partial Differential Equations (PDEs): Lagrange and Charpit methods for solving first order PDEs, Cauchy problem for first order PDEs. Classification

of second order PDEs, General solution of higher order PDEs with constant coefficients, Method of separation of variables for Laplace, Heat and Wave equations.

Numerical Analysis: Numerical solutions of algebraic equations, Method of iteration and Newton-Raphson method, Rate of convergence, Solution of systems of linear algebraic equations using Gauss elimination and Gauss-Seidel methods, Finite differences, Lagrange, Hermite and spline interpolation, Numerical differentiation and integration, Numerical solutions of ODEs using Picard, Euler, modified Euler and Runge-Kutta methods.

Calculus of Variations:

Variation of a functional, Euler-Lagrange equation, Necessary and sufficient conditions for extrema. Variational methods for boundary value problems in ordinary and partial differential equations.

Linear Integral Equations:

Linear integral equation of the first and second kind of Fredholm and Volterra type, Solutions with separable kernels. Characteristic numbers and eigenfunctions, resolvent kernel.

Classical Mechanics:

Generalized coordinates, Lagrange's equations, Hamilton's canonical equations, Hamilton's principle and principle of least action, Two-dimensional motion of rigid bodies, Euler's dynamical equations for the motion of a rigid body about an axis, theory of small oscillations.

UNIT 4

Descriptive statistics, exploratory data analysis, Sample space, discrete probability, independent events, Bayes theorem. Random variables and distribution functions (univariate and multivariate); expectation and moments. Independent random variables, marginal and conditional distributions. Characteristic functions. Probability inequalities (Tchebyshef, Markov, Jensen). Modes of convergence, weak and strong laws of large numbers, Central Limit theorems (i.i.d. case).

Markov chains with finite and countable state space, classification of states, limiting behaviour of n-step transition probabilities, stationary distribution, Poisson and birth-and-death processes.

Standard discrete and continuous univariate distributions. sampling distributions, standard errors and asymptotic distributions, distribution of order statistics and range.

Methods of estimation, properties of estimators, confidence intervals. Tests of hypotheses: most powerful and uniformly most powerful tests, likelihood ratio tests. Analysis of discrete data and chi-square test of goodness of fit. Large sample tests.

Simple nonparametric tests for one and two sample problems, rank correlation and test for independence. Elementary Bayesian inference.

Gauss-Markov models, estimability of parameters, best linear unbiased estimators, confidence intervals, tests for linear hypotheses. Analysis of variance and covariance. Fixed, random and mixed effects models. Simple and multiple linear regression. Elementary regression diagnostics. Logistic regression. Multivariate normal distribution, Wishart distribution and their properties. Distribution of quadratic forms. Inference for parameters, partial and multiple correlation coefficients and related tests. Data reduction techniques: Principle component analysis, Discriminant analysis, Cluster analysis, Canonical correlation. Simple random sampling, stratified sampling and systematic sampling. Probability proportional to size sampling. Ratio and regression methods.

Completely randomized designs, randomized block designs and Latin-square designs. Connectedness and orthogonality of block designs, BIBD. 2K factorial experiments: confounding and construction.

Hazard function and failure rates, censoring and life testing, series and parallel systems.

Linear programming problem, simplex methods, duality. Elementary queuing and inventory models. Steady-state solutions of Markovian queuing models: M/M/1, M/M/1 with limited waiting space, M/M/C, M/M/C with limited waiting space, M/G/1.

6.6.2 DEPARTMENT OF PHYSICS (MAIN AND EAST CAMPUS)

1. The Department

The Department of Physics was created as a separate department in December 2013. The department primarily caters to the teaching requirement of various courses in Physics which form an essential component of all undergraduate programmes (Theory and Practical) in the first and second semester at the University. In addition to the undergraduate teaching responsibilities, the department is actively involved in the Ph.D. Programme in Physics in collaboration with institutions like University of Delhi, NPL, Jamia Millia Islamia, JNU, IIT Delhi etc.

2. Courses offered

The department caters teaching of compulsory (FCPH) courses in Physics at UG level with practical in the first two semesters alternatively for all the departments. In addition, two courses namely Physics of Materials and Applied Physics course are being taught to the BSE Students and Mathematical Applications and Computing students respectively in the second semester. The Department is currently running. M. Sc. (Physics) programme with an intake of thirty students.

3. Areas of Research and Available Vacancies

- **Solar Energy Materials and Device Application:** Solar Energy Material Preparation at Micro/Nano size by various techniques. Study of synthesized Nano materials by different characterization techniques to study the Structural, Optical and electrochemical properties for device fabrication of Solar cells, Super capacitors etc. Development of nanostructured thin film solar cells and characterization by electrochemical workstation. The research lab working towards the Green Energy Technology.
- **Functional Materials (Bulk & Thin films):** Doped ferrites, Multiferroics, Ferroelectric and Ferromagnetic Composites, Magneto-electric Composites, Co-Doped ferrites, Electro-ceramics for sensing/device applications. In the recent times, it is essential to look for the future in the approach of discovering new materials and developing new composites and

novel materials. Rare-earth ferrites and manganites are few ferroic materials are novel as they exhibit giant dielectric effect, colossal magnetoresistance and multiferroic properties which make them potential candidates as sensors and memory materials. The Ferroic materials have attracted interest due to their useful magnetoelectric (ME) susceptibility exhibited by Ferromagnetic (FM) and Ferroelectric (FE) phases in the composites and multilayer laminates. Composites of ferromagnetic and ferroelectric compounds have found tremendous potential applications in data storage, spin valves, quantum electromagnets, microelectronic devices, sensors, waveguides, switches, and modulators, many multifunctional devices such as—memory devices based on ME effect.

- **Materials Science** :Synthesis and characterization of nanomaterials and thin films. Application of synthesized materials in energy harvesting devices.

3.1 Tentative Seats:

For the coming session 2022-23 (Even semester), the maximum number of seats/vacancies in the Department of Physics are limited to:

- (i) **Seats with university fellowship : 04**
- (ii) **Seats without university fellowship : 02**

However, the University reserves the right to change the number of above seats.

***The table below indicates the maximum number of vacancies available in various areas of research. However, the total number of seats are given as above:**

S. No.	Area of Research	Faculty	Campus	Maximum number of vacancies	
				With Univ. Fellowship (TRF)	Without Univ. Fellowship Self-Sponsored, UGC, CSIR, DST RF and others

1.	Solar Energy Materials and Device Application	Prof. Ranjana Jha	Main Campus	NIL	01
2.	Functional Materials: Ferrites, Multiferroics, Nano-Composites.	Prof. O.P. Thakur	Main Campus	01	01
3.	Magnetic materials & Device Applications	Dr. Vinod Kumar	Main Campus	NIL	NIL
4.	Supercapacitors & photocatalysis	Dr. Vinamrita Singh	East Campus	01	00
5.	Crystal Growth	Dr. Harsh Yadav	Main Campus	01	00
6.	Solar Energy, LED and Memory devices	Dr. JehovaJire L. Hmar	Main Campus	01	NIL

4. Faculty Profile

4.1. Prof. Ranjana Jha

1.Designation, Qualifications: Professor and Head, Ph.D

2.Email Id.: drranjana@nsut.ac.in ,

3.Mobile No.-+91-9810210255

4.Home Page: <http://nsut.ac.in/division/phy/faculty/>

5.Areas of Interest: Solar Energy Materials and Solar Energy Utilization, Development of nano-structured thin film Solar cells and Characterization of Energy Materials for Device Applications.

6. Selected Publications:

a. Surface activity correlations of mesoporous 3-D hierarchical ZnS nanostructures for enhanced photo and electro catalytic performance, Applied Surface Science,528 (2020) 146988 (Elsevier),Medha Bhushan and Ranjana Jha **(Impact factor-6.182) [SCI]**



b. Trisodium Citrate Assisted Morphology Controlled Synthesis of Nickel Sulphide Nanoparticles with Enhanced Cyclic Stability as Carbonaceous Free Electrode Material Material Physics and Chemistry (Elsevier) SCI indexed. Rekha Bhardwaj and Ranjana Jha <https://doi.org/10.1016/j.matchemphys.2020.123581> **(Impact factor 3.408) [SCI]**.

c. Ethylenediamine-assisted growth of multi-dimensional ZnS nanostructures and study of its charge transfer mechanism on supercapacitor electrode, Nanotechnology 31(2020) 235602 (IOP Publishing), [Medha Bhushan](#), [Ranjana Jha](#), Reetu Sharma and [Rekha Bhardwaj](#) **(Impact factor-3.399)[SCI]**

7. Biosketch: Prof. Ranjana Jha, Department of Physics, Netaji Subhas University of Technology, has been actively involved in research and teaching in the field of Solar Energy materials and Applied Physics. Received several awards for excellence in education and solar energy utilization. She is ***founder and in-charge of Research Lab for Energy Systems at Department of Physics***. Her research interests are Solar Energy Materials and Solar Energy Utilization, Development of Nano-structured thin film Solar cells and Characterization of Energy Materials for Device Applications. Published 161 manuscripts in reputed international/national journals and proceedings. The papers authored/ co-authored by her, have received best paper prize, best oral and poster award, innovative pitch speaker at various national/ international conferences. Undertaken several research projects from AICTE, DST, PCRA , MNRE and Energy efficiency & Renewable Energy Management Centre, Deptt. Of Power, GNCTD , Delhi. She has one patent (Design Of A Novel Trailing Arm Suspension System With Type One Lever Mechanism, Patent ID-201611042722, **Publication No.-25/2018, IPC Classification-F01N11/00**) in her credit. **She has been awarded the certificate of Outstanding Reviewer twice, (2014 & 2016) by Solar Energy Journal, Elsevier.** She has been reviewer of several journals and conferences held in India and Abroad. She has delivered several invited lectures/talks related to Solar Energy Technologies in various educational and research institutions as well as in various national or international conferences and workshops and part of the panel discussions. She has also chaired or co-chaired several sessions in various National or International conferences.

4.2 Prof. O P Thakur, Ph.D.



1. **Designation:** Professor, Dept of Physics, NSUT
2. **E Mail Id.** opthakur@yahoo.com,
opthakur@nsut.ac.in
3. **Mobile:** 9891548511
4. **Home page:** <http://nsut.ac.in/division/phy/faculty/>

5. Area of Interest:

Functional Materials (Bulk & Thin films) - Doped ferrites, Multiferroics, Ferroelectric & Ferromagnetic composites for environment friendly Magnetolectric devices, Multi-state Memory devices (MRAMs, FeRAMs, MEMS), Magnetolectric sensors, Transducers etc, and Electroceramics.

6. List of three Recent Publications indicating area of work:

1. Samiksha Dabas, Meenu Chahar, O P Thakur, "Electromagnetic interference shielding properties of poly(vinylidene fluoride)/nano-CoFe₂O₃/polyaniline composites", Materials Chemistry and Physics (Elsevier), Volume 278, 15 February 2022, 125579, <https://doi.org/10.1016/j.matchemphys.2021.125579>, (Impact factor: 4.094).
2. Meenu Chahar, Samiksha Dabas, O P Thakur, "Enhanced electromagnetic shielding effectiveness of MWCNT/zinc-doped nickel ferrite nanocomposites", Ceramics International (Elsevier), Volume 48, Issue 4, 15 February 2022, Pages 5352-5360, Available online 11 November 2021, <https://doi.org/10.1016/j.ceramint.2021.11.078>, (Impact factor-4.527).
3. Prachi Chaudhary, Rishabh Shukla, Samiksha Dabas, O. P. Thakur, "Enhancement of structural, magnetic, dielectric, and transport properties of Nb substituted 0.7BiFeO₃-0.3BaTiO₃ solid solution", Journal of Alloys and Compounds (**Elsevier**), Volume 869, 15 July 2021, 159228, Accepted on 15 Feb 2021, <https://doi.org/10.1016/j.jallcom.2021.159228>, (**Impact factor : 5.316**).

7. Bio-Sketch: Dr. Thakur is a Professor in the Department of Physics, Netaji Subhas University of Technology (erstwhile Netaji Subhas Institute of Technology), New Delhi since 2006. Dr. Thakur has

supervised/supervising fourteen Ph.D. theses. He has published more than one hundred research papers in the leading International Journals (forty-two in SCI/SCIE listed journals) and referred conference proceedings/book chapters in the reputed publishers. He is in the panel of reviewers of a no. of SCI/SCIE listed international journals.

4.3 Dr. Vinod Kumar



1. **Designation, Qualifications:** Associate Professor, PhD
2. **Email ID:** vinod.kumar@nsut.ac.in
3. **Phone Number:** 8199996521
4. **Area of Interest:** Material Science, Nano-magnetism, Ferrofluids
5. **Bio Sketch:**

Dr. Vinod Kumar is presently working as Associate Professor at Department of Physics, NSUT, New Delhi. His research area is in the field of nano-materials specially the synthesis, properties and applications of nano-magnetic particles/magnetic fluids in energy and sensor devices having good industrial applications. He has received research awards from NPL, New Delhi; International Union of Radio Sciences and Indian National Science Academy. Dr. Vinod Kumar has about 52 publications in International Journals. Two patents had been granted to him and two more were filed. Five students have completed their Ph.D. degree in his supervision. He has been actively involved in research projects granted from funding agencies like DST, UGC, UGC-DAE.

4.4 Dr. Harsh Yadav (Main Campus)

1. **Designation, Qualifications:** Assistant Professor, PhD
2. **Email ID:** harsh@nsut.ac.in
3. **Phone Number:** 8802273723
4. **Area of Interest:** Single Crystal Growth
5. **Selected publications:**



a) "Hirshfeld surface, etching, mechanical and electrical enhancement analyses of pyramid pattern of Xylenol Orange dye in Triglycine Sulphate single crystals Ranjan Kumar, Nidhi Sinha, Harsh Yadav, Binay Kumar, J. Solid State Chem. 2022, 315, 123198 (IF: 3.656)

b) "A systematic study of the third-order nonlinear optical co-crystal of his ((diisopropylammonium) dichromate X-ray, Hirshfeld surface. Optical, and Mechanical analysis" Preetika Dhawan, Anupama Saini, Sahil Goel, Nidhi Tyagi, Harsh Yadav. Mol. Struct 2022, 1270, 133869. (IF:3.841)

6. **Bio-Sketch:** Dr. Harsh Yadav is Assistant Professor in the Department of Physics, Netaji Subhas University of Technology, New Delhi, India. His research focuses on the development of new multifunctional materials and understanding the structure-property relationships for piezoelectric, ferroelectric, nonlinear optical, electrical properties of single crystals and their relation with intermolecular interactions and crystals defects. He has published 35 research papers in international journals, 1 book and 3 conference proceedings.

4.5 Dr. JehovaJire L. Hmar (Main Campus)

1. Designation, Qualifications: Assistant Professor, PhD

2. Email ID:

3. Phone Number: 7006236594

4. Area of Interest: Material Science & Nano-technology

5. Google Website:

<https://sites.google.com/view/jehovajirelhmar/home>

6. Bio-Sketch: Dr. JehovaJire L. Hmar is presently working as Assistant Professor at Department of Physics, NSUT, New Delhi. Dr. JehovaJire L. Hmar has about 11 publications in International Journals, 4 International Conference Proceeding and published one book chapter in **DNA Publication**. He has completed on major project funded by UGC-BSR, Govt. of India. He has supervised one PhD student. His current research interests include the growth, fabrication and characteristics of II-VI and IV-VI semiconductor nanostructures for flexible electronic (Nonvolatile Memory device, Dielectric device) and optoelectronic (Photodetectors, Photovoltaics, Light Emitting Diode, Photoelectrochemical Cells) Applications.



4.6 Dr. Vinamrita Singh (East Campus)

1. Designation, Qualifications: Assistant Professor, PhD

2. Email ID vinamritasingh.phy@gmail.com

3. Phone Number: 011-21210167

4. Area of Interest: Energy harvesting devices, multiferroics

5. Home Page:

<https://sites.google.com/site/drvinamritasingh/>

7. Selected Publications

- a. Gagandeep, Mukhtiyar Singh, Ramesh Kumar and Vinamrita Singh, Investigating the impact of layer properties on the performance of p-graphene/CH₃NH₃PbI₃/n-cSi solar cell using numerical modelling, Superlattices and Microstructures, 140, 106468 (2020)
 - b. Vinamrita Singh, Tanuj Kumar, Study of Modified PEDOT:PSS for Tuning the Optical Properties of its Conductive Thin Films, Journal of Science: Advanced Materials and Devices, 4, 538-543 <https://doi.org/10.1016/j.jsamd.2019.08.009> (2019)
 - c. Vinamrita Singh, Swati Arora, Manoj Arora, Vishal Sharma, and R.P. Tandon, Characterization of doped PEDOT:PSS and its influence on the performance and degradation of organic solar cell, Semiconductor Science and Technology 29 (2014) 8pp.
8. **Bio-Sketch:** Vinamrita Singh is currently working as an Assistant Professor of Applied Physics at NSUT (East Campus) formerly AIACTR, Govt. of NCT of Delhi. She has previously taught for more than two years at Ramjas College, University of Delhi. She obtained her Ph.D. degree from Department of Physics & Astrophysics, University of Delhi in 2015. Her areas of research are polymer thin films, organic/perovskite solar cells, solar powered water pumping system, and multiferroics. She has published more than 20 papers in International journals. She is an alumnus of Lindau Nobel Laureate Meeting, held each year in Lindau, Germany.



5. Laboratory Infrastructure

5.1 Research Lab for Energy Systems

The Research Lab for Energy Systems consists of facilities for advanced level research in Solar Energy Materials and Solar Cells is situated in Room No. 316 of Block VI. The facility of synthesizing nano-structured materials,

thin films has been setup for various energy generation, conversion and storage devices such as solar cells, electrochemical supercapacitors etc.

The laboratories are equipped with various apparatus such as Spin Coating Unit, High Temperature Furnace, Heating Oven, Ultrasonicator, Bench top pH meter, Autoclave, Hot plate with Magnetic stirrer, Vacuum Oven, Rotatory evaporator, Fume hood and Basic Solar Simulator system for Silicon solar cell. The lab is equipped with the latest version of characterization equipments such as Biologic Electrochemical workstation.

5.2 Materials Analysis and Research Laboratory:

This lab focuses on synthesis and characterization for a variety of engineering materials like Functional Materials: Doped ferrites, Multiferroics, Ceramics, Electro-elastic Materials, Composites of Ferroelectric and Ferromagnetic Compounds to pursue research and provide education in the interdisciplinary field of Materials Science and Technology. These materials have tremendous potential applications in MRAMs, FeRAMs, MEMS, data storage, spin valves, quantum electromagnets, microelectronic devices, sensors, waveguides, switches, and modulators and in other device applications. At present, the lab offers facilities like PE loop tracer system, Magneto resistance measurement setup, ME-setup, LCR meter, Spray Pyrolysis set up, Furnace 1200°C - 1400°C, Vacuum Rotary Evaporator, Hydraulic press pelletizer, Spin coating unit, Ball mill, Power point projector, Oil bath and probe sonicator, Vacuum oven etc in addition to the computational facilities.

5.3. Applied Physics Lab (EAST CAMPUS)

The Applied Physics Lab is equipped with experiments related to optics, sound, and electricity & magnetism. The lab has a dedicated dark room facility for the conduct of optical experiments. The lab caters to the need of B.Tech. 1st year students to enhance their knowledge about the basic physics concepts like interference, diffraction, and polarization of light; fibre optics; photoelectric effect; Hall Effect; four probe experiment; Stefan's law; etc.

6. ELIGIBILITY FOR ADMISSION TO THE PhD PROGRAMME IN PHYSICS

M.Sc. or equivalent degree in Physics/Electronics/ M.Sc. in Material Science and Nanotechnology/M.Sc. in Nanoscience and Technology/M.Sc.

in Nanotechnology or Dual degree/ integrated course for Masters degree in physics.

7 SYLLABUS FOR WRITTEN TEST:

The entrance test shall consist of 100 multiple choice questions. There shall be no negative marking. 50 questions shall be based on Research Aptitude/Methodology which shall include quantitative methods/computer applications, experimental techniques etc. and 50 questions shall be subject specific. The test shall be of Two hours.

Part A Research Aptitude/Methodology:

Unit-1 Research Aptitude

- Research: Meaning, Types, and Characteristics, Positivism and Post-positivistic approach to research.
- Methods of Research: Experimental, Descriptive, Historical, Qualitative and Quantitative methods.
- Steps of Research.
- Thesis and Article writing: Format and styles of referencing.
- Application of ICT in research.
- Research ethics.

Unit-2 Comprehension & Communication

- A passage of text be given. Questions be asked from the passage to be answered.
- Communication: Meaning, types and characteristics of communication.
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- Barriers to effective communication.
- Mass-Media and Society.

Unit-3 Mathematical Reasoning and Aptitude

- Types of reasoning.
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- Understanding the structure of arguments: argument forms, structure of categorical propositions, Mood and Figure, Formal and Informal fallacies, Uses of language, Connotations and denotations of terms, Classical square of opposition.
- Evaluating and distinguishing deductive and inductive reasoning.

- Analogies.
- Venn diagram: Simple and multiple use for establishing validity of arguments.

Unit-4 Data Interpretation

- Sources, acquisition and classification of Data.
- Quantitative and Qualitative Data.
- Graphical representation (Bar-chart, Histograms, Pie-chart, Table-chart and Line-chart) and mapping of Data.
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- Data and Governance.

Unit-5 Information and Communication Technology (ICT)

- ICT: General abbreviations and terminology.
- Basics of Internet, Intranet, E-mail, Audio and Video-conferencing.
- Digital initiatives in higher education.
- ICT and Governance.

NOTE: (i) Equal number of questions are to be set from each Unit.

(ii) Whenever graphical/pictorial question(s) are set for sighted candidates, a passage followed by equal number of questions and weightage be set for visually impaired candidates.

Part B: Department Specific Subject:

Section 1: Mathematical Physics

Linear vector space: basis, orthogonality and completeness; matrices; vector calculus; linear differential equations; elements of complex analysis: Cauchy-Riemann conditions, Cauchy's theorems, singularities, residue theorem and applications; Laplace transforms, Fourier analysis; elementary ideas about tensors: covariant and contravariant tensor, Levi-Civita and Christoffel symbols.

Section 2: Classical Mechanics

D'Alembert's principle, cyclic coordinates, variational principle, Lagrange's equation of motion, central force and scattering problems, rigid body motion; small oscillations, Hamilton's formalisms; Poisson bracket; special theory of relativity: Lorentz transformations, relativistic kinematics, mass-energy equivalence.

Section 3: Electromagnetic Theory

Solutions of electrostatic and magnetostatic problems including boundary value problems; dielectrics and conductors; Maxwell's equations; scalar and vector potentials; Coulomb and Lorentz gauges; Electromagnetic waves and

their reflection, refraction, interference, diffraction and polarization; Poynting vector, Poynting theorem, energy and momentum of electromagnetic waves; radiation from a moving charge.

Section 4: Quantum Mechanics

Postulates of quantum mechanics; uncertainty principle; Schrodinger equation; one-, two- and three-dimensional potential problems; particle in a box, transmission through one dimensional potential barriers, harmonic oscillator, hydrogen atom; linear vectors and operators in Hilbert space; angular momentum and spin; addition of angular momenta; time independent perturbation theory; elementary scattering theory.

Section 5: Thermodynamics and Statistical Physics

Laws of thermodynamics; macrostates and microstates; phase space; ensembles; partition function, free energy, calculation of thermodynamic quantities; classical and quantum statistics; degenerate Fermi gas; black body radiation and Planck's distribution law; Bose-Einstein condensation; first and second order phase transitions, phase equilibria, critical point.

Section 6: Atomic and Molecular Physics

Spectra of one- and many-electron atoms; LS and jj coupling; hyperfine structure; Zeeman and Stark effects; electric dipole transitions and selection rules; rotational and vibrational spectra of diatomic molecules; electronic transition in diatomic molecules, Franck-Condon principle; Raman effect; NMR, ESR, X-ray spectra; lasers: Einstein coefficients, population inversion, two and three level systems.

Section 7: Solid State Physics & Electronics

Elements of crystallography; diffraction methods for structure determination; bonding in solids; lattice vibrations and thermal properties of solids; free electron theory; band theory of solids: nearly free electron and tight binding models; metals, semiconductors and insulators; conductivity, mobility and effective mass; optical, dielectric and magnetic properties of solids; elements of superconductivity: Type-I and Type II superconductors, Meissner effect, London equation. Semiconductor devices: diodes, Bipolar Junction Transistors, Field Effect Transistors; operational amplifiers: negative feedback circuits, active filters and oscillators; regulated power supplies; basic digital logic circuits, sequential circuits, flip-flops, counters, registers, A/D and D/A conversion.

Section 8: Nuclear and Particle Physics

Nuclear radii and charge distributions, nuclear binding energy, Electric and magnetic moments; nuclear models, liquid drop model: semi-empirical mass formula, Fermi gas model of nucleus, nuclear shell model; nuclear force and two nucleon problem; alpha decay, beta-decay, electromagnetic transitions in

nuclei; Rutherford scattering, nuclear reactions, conservation laws; fission and fusion; particle accelerators and detectors; elementary particles, photons, baryons, mesons and leptons; quark model.

6.6.3 DEPARTMENT OF CHEMISTRY (MAIN AND EAST CAMPUS)

1. The Department

The Department of Chemistry of Netaji Subhas University of Technology (formerly Netaji Subhas Institute of Technology) was established in the year 1983 under the School of Applied Sciences. It was created as a separate department in December 2013. The department supports the Engineering Divisions by offering common courses in Chemistry (theory and practical) in the second and third semester (theory and practical). Besides, research work is also being carried out in collaboration with institutions like the University of Delhi and NPL etc.

2. Courses Offered

The Department offers Chemistry theory with practicals at UG level from Vth Semester onwards (till VIIIth Semester) and Advance Organic Chemistry in Biological Sciences & Engineering (BSE). The department also offers a research program in the field of physical, inorganic, organic, analytical chemistry and Polymer Chemistry/Science. Proposed M.Sc. for Polymer Sciences with an intake of 30 students has been considered for recommendation by the Senate of the University.

To keep in pace with the current technological advancements, the UG curriculum has been recently modified so that the students get a feel of what exactly is happening outside in the technical world.

3. Areas of Research and Available Vacancies

Our research capabilities provide solutions for clients and partners in a wide range of sectors including those listed below:

- **Material Sciences**

Material preparation at the nano and micro level by various methods, the study of nanomaterials by various characterization techniques to optimize the structural, optical and electrochemical properties, the study of

nanocrystals as catalyst and sensors, the utility of functional materials in device fabrication of solar cells and supercapacitors.

- **Corrosion Inhibitors**

There is a research facility in the field of corrosion chemistry: synthesis of corrosion inhibitors, characterization, determination of inhibition efficiency and electrochemical studies such as Electrochemical impedance spectroscopy and Tafel polarization etc.

- **Schiff's Base Metal Complexes**

Schiff's base class of compounds plays an essential role in various fields of chemistry such as Agriculture, Pharmaceutical and Industrial chemistry. Schiff's base is the flexible ligands which are synthesized from the condensation of primary amines with carbonyl groups such as aldehyde and ketones. These compounds show a wide spectrum of biological activities. The synthesis followed by its characterization by IR, UV, MASS, NMR leads a way to find a new Schiff base. The structural parameters further establish a new dimension in the discovery of these complexes.

- **Polymer Sciences:** Work is being done in the field of graphene reinforced nanocomposites, studies on preparation and characterization of biodegradable polymer blends/composites for biomedical applications, preparation and characterization of protein isolate thermoplastic blends/composites, environmentally friendly polymers and biopolymer blends for advanced wound dressing.
- **Physical / Nano-Chemistry:** Bandgap Engineering, Type-II Semiconductor Core/Shell Nanostructures, Nanomaterials and Photocatalysis
- **Synthetic Organic Chemistry:** Porphyrinoids, Nano-Composites, Green Chemistry, Catalysis.
- Fluorescence spectroscopy, semiconductor nanomaterials for photovoltaic applications, photophysics, Materials Chemistry

3.1 Tentative Seats:

For the session 2022-23 (Even semester), the maximum number of seats in the Department of Chemistry is limited to

- (i) **Seats with university fellowship: 05**
(ii) **Seats without university fellowship: 05**

University reserves the right to change the number of seats

***The table below indicates the maximum number of vacancies available in various areas of research. However, the total number of seats are as given above**

S. No	Area of Research	Faculty	Maximum number of vacancies	
			With Univ. Fellowship (TRF)	Without Univ. Fellowship Self-Sponsored, UGC, CSIR, DST RF and others
1.	Schiff's Base Metal Complexes /Synthetic Organic Chemistry	Prof. Anjana Sarkar	01	01
2.	Polymer Chemistry, Nanocomposites, Polymer Technology	Prof. Purnima Jain	01	01
3	Inorganic Chemistry, Study of Corrosion Inhibitors, Thermal Studies, Material Sciences	Prof. Sanjeeve Thakur	01	01
4	Bandgap Engineering, Type-II Semiconductor Core/Shell Nanostructures, Nanomaterials and Photocatalysis	Dr. Sunita	00	00
5	Porphyrinoids, Nano-Composites, Green Chemistry, Catalysis.	Dr. Uma Narang	01	01

6	Fluorescence spectroscopy, nanomaterials for various applications, Materials Chemistry	Dr Nancy Gupta	01	01
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4. Faculty Profile

4.1 Prof. Anjana Sarkar

- Designation, Qualifications:** Professor and Head of the Department, Ph.D.
- Areas of Interest:** Schiff Base Metal Complexes, DFT and QSAR Studies
- E-mail: anjisarkar@gmail.com anjana.sarkar@nsit.ac.in
- Phone: 011-25000240
- Home Page: <http://www.nsit.ac.in/faculty/as/>



6. Selected Publications:

- International Journal of Nanobiotechnology, *Nanotechnology Based Drug Delivery System In Tuberculosis: Review*, Sharma D, Sinha N, Sarkar A and Gupta RK, **Vol. 3**, Issue 2, 14-24, **2017**.
 - Chemical Biology Letters, *Antimycobacterial Activity of Schiff's Bases Synthesized from Substituted Benzaldehyde Activity against Mycobacterium*, Sharma D, Sinha N, Sarkar A and Gupta RK, **Vol.5**, Issue 2, 55-62, **2018**.
 - Polymer Testing, *Nanomechanical analysis of chemically reduced graphene oxide reinforced poly (vinyl alcohol) nanocomposite thin films*, Bhasha Sharma, Shashank Shekher, Sanjeev Gautam, Anjana Sarkar, Purnima Jain, **70**,458-466, **2018**
7. Bio-Sketch: Dr. Anjana Sarkar joined as a faculty in the Department of Chemistry in 1992. She has done her M.Sc. in Chemistry (Organic) from University of Calcutta in 1985. She has obtained her Ph.D. in 1990 from the University of Delhi. She has 24 Full-length papers published in national and international journals, paper & poster presentation in 26 conferences & seminars. She has completed research supervision of 2 Ph.D. students. She is Life-members of many Learned Societies - Indian Science Congress, Indian Chemical Society, National Academy of Sciences, Indian Council of Chemist, Chemical Research Society Of India, Vibha (Vijnana Bharati), IEES- Institute Of Ecotoxicology & Environmental Sciences : [Vice-President & Life Member]. She was

Principal Investigator of AICTE sponsored R&D Project: *Ternary Complexes of Transition Metal Ions with Novel Biomolecular like Kojic Acid & L-Amino acid: Synthesis & Study of Physicochemical Properties and their Bio-efficacy*. She has been awarded “**Woman of the Year 1998.**” by The American Biographical Institute, North Carolina, US.

4.2 Professor Sanjeeve Thakur

1. Designation, Qualifications: Professor, Ph.D.
2. Areas of Interest: Inorganic Chemistry, Study of Corrosion Inhibitors, Thermal Studies, Material Sciences
3. E-mail: sanjeevethakur63@yahoo.co.in
4. Phone: 011-25000239
5. Home Page: <http://nsut.ac.in/faculty/st/>



6. Selected Publications:

- a. Singh, A.K., Thakur S., Pani, B., Chugh, B., Lgaz, H., Chung, I.-M., et. al. (2019), Solvent-free microwave-assisted synthesis and corrosion inhibition study of a series of hydrazones derived from thiophene derivatives: Experimental, surface and theoretical study. *Journal of Molecular Liquids*.
 - b. A.K. Singh, S, Thakur, B. Pani and G. Singh, “Green synthesis and corrosion inhibition study of 2-amino-N’-((thiophen-2-yl)methylene)- benzohydrazide”, *New J. Chem. (RSC)*, 42, 2018, 2113.
 - c. A.K. Singh, S.Thakur, B.Pani, E.E. Ebenso, M. A. Quiraishi and A. Pandey “2-Hydroxy-N- ((thiophen-2-yl)methylene) benzohydrazide: ultrasound assisted synthesis and corrosion Inhibition study”, *ACS Omega*, 2018, 3, 4695–4705.
7. Bio-Sketch: Prof. Sanjeeve Thakur joined NSIT in June 1992 as a permanent faculty in the Department of Chemistry. He has done his M.Sc. from the University of Delhi in 1986 and Ph. D. from Bhagalpur University in the year 1989. His area of interest is Inorganic Chemistry. He is a life member of five learned societies, viz. Indian Science Congress, Indian Chemical Society, National Academy of Sciences, Indian Council of Chemists and Indian Society of Analytical Scientists, BARC. The faculty member has also received Medal of Honor from the American Biographical Institute, North Carolina, the USA in the year 2000. One research student has been awarded Ph.D. degree from the University of Delhi under his supervision. He has been involved in various activities at the Institute level like Student’s Affairs, theory and practical examinations at the superintendent /deputy superintendent level, general administration of the Institute establishment since long in addition to the duties and responsibilities of a faculty member.

4.3 Prof. Purnima Jain



1. Designation, Qualifications: Professor, Ph.D.
2. Areas of Interest: Polymer Blends and Composites, BioComposites, Nano Composites
3. E-mail: prnm_j@yahoo.co.in
4. Phone: -91-9910679759
5. Home Page: <http://www.nsit.ac.in/faculty/pj/>
6. Selected Publications:
 - a. Bhasha, Parul Malik, Purnima Jain, “To Study the Effect of Processing Conditions on Structural & Mechanical Characterization of Graphite & Graphene Oxide Reinforced PVA Nanocomposite” Accepted in Polymer Bulletin journal (2018) (Springer).
 - b. Sharma Bhasha, Shashank Shekhar, Parul Malik, and Purnima Jain, “Study of the mechanism involved in the synthesis of graphene oxide and reduced graphene oxide from graphene nanoplatelets” in Materials Research Express 5, 6, 1-11 (2018)
 - c. Reinforced Nanocomposites: A Comprehensive Review” Accepted in MaterialsToday Communications 16, 353-363. (2018) (Elsevier).
7. Bio-Sketch: Prof. Purnima Jain completed her Master of Science and Master of Technology from Department of Chemistry IIT Delhi in 1990 and 1995 respectively. She gained her Ph.D. from Centre for Polymer Science and Engineering IIT Delhi in 2001. She joined NSIT in 2002 in the School of Applied Sciences as a lecturer in Chemistry. She carries life memberships of Polymer Processing Society, Asian Polymer Association, the Indian society for Technical Education, Institute of Ecotoxicology and Environmental Sciences and VIBHA (Vijnana Bharati). She has more than 20 research papers to her credit along with some conference proceedings at national and international levels. She has completed two Ph.D. theses under her supervision. Besides teaching chemistry, her general research interests are development and characterization of blends, alloys and polymer nanocomposites. Her research interest also includes graphene reinforced nanocomposites, studies on preparation and characterization of biodegradable polymer blends/composites for biomedical applications, preparation and characterization of protein isolate thermoplastic blends/composites, environmentally friendly polymers and biopolymer blends for advanced wound dressings.

4.4 Dr. Sunita (EAST CAMPUS)

1. **Designation, Qualifications:** Assistant Professor, Ph. D.
2. **Areas of Interest:** Bandgap Engineering, Type-II Semiconductor Core/Shell Nanostructures, Nanomaterials and Photocatalysis
3. E-mail: drsunita@aiactr.ac.in
4. Phone: 011-21210167
5. Homepage: <http://nsuteastcampus.aiactr.ac.in/index.php/faculty/8-online-classes/76-dr-sunita>
6. **Selected Publications:**
 - a. Shell Thickness Dependent Photocatalytic Properties of ZnO/CdS Core-Shell Nanorods, **S Khanchandani**, S. Kundu, A. Patra & A. K. Ganguli *J. Phys. Chem. C* 2012, 116, 23653–23662 (INTERNATIONAL JOURNAL) (Impact factor: **4.189**) DOI: 10.1021/jp3083419.
 - b. Band Gap Tuning of ZnO/In₂S₃ Core/Shell Nanorod Arrays for Enhanced Visible-Light-Driven Photocatalysis, **S Khanchandani**, S. Kundu, A. Patra & A. K. Ganguli *J. Phys. Chem. C* 2013, 117, 5558–5567 (INTERNATIONAL JOURNAL) (Impact factor : **4.189**) DOI: 10.1021/jp310495j.
 - c. Band Gap Engineering of ZnO using Core/Shell Morphology with Environmentally Benign Ag₂S Sensitizer for Efficient Light Harvesting and Enhanced Visible-Light Photocatalysis **S. Khanchandani***, P. K. Srivastava, S. Kumar, S. Ghosh & A. K. Ganguli *Inorg. Chem.* 2014, 53, 8902–8912 (INTERNATIONAL JOURNAL) (Impact factor: **4.850**) (* equal contribution).
7. **Bio-sketch:** Dr. Sunita completed her undergraduate degree in Chemistry from Daulat Ram College, University of Delhi, and a post-graduate degree in Chemistry (specialization: Physical Chemistry) from the Department of Chemistry, University of Delhi. She completed her doctoral studies at the Department of Chemistry, Indian Institute of Technology Delhi. She is the recipient of the Junior Research Fellowship (JRF) from the Council of Scientific and Industrial Research (CSIR) in Chemical Sciences, India. She had received several accolades (Smt. Shakuntala Chadha Memorial Prize, Hemraj Sharma Memorial Prize, etc.) from Daulat Ram College, University of Delhi, for being the



meritorious student of B. Sc. (H) Chem. in all years and all years combined. She had also been awarded Meritorious Award in all years by the University of Delhi during her undergraduate studies for being the meritorious student of the University of Delhi. She had received the Prestigious “**Jeans & Ashit Ganguly Education Scholarship**” during her postgraduate studies by the Department of Chemistry, University of Delhi, for being the meritorious student of the University of Delhi. She had published research papers in highly prestigious ACS journals.

4.5 Dr. Uma Narang



1. Designation, Qualifications: Assistant Professor, Ph.D.
2. Areas of Interest: Porphyrinoids, Nano-Composites, Green Chemistry, Catalysis.
3. E-mail: umanarang89@gmail.com
4. Phone: +91-9540716971
5. Home Page: <http://www.nsit.ac.in/faculty/uan/>
6. Selected Publications:
 - a. Yadav, K.K.; Narang, U. (2019). Organic Chemistry Book. New Delhi: Delhi, Viva Books (ISBN:978-93-89401-53-0).
 - b. Narang, U.; Gautam, R.; Yadav, K.K.; Bhattacharya, S.; Sahu, P. K.; Aggarwal, A.K.; Chauhan, S.M.S.; Hydrogen bond controlled self-assembly of nanostructured triazine-functionalized new porphyrin molecule, Chemical Papers, <https://doi.org/10.1007/s11696-022-02127-x>, 2022.
 - c. Narang, U.; Yadav, K.K.; Bhattacharya, S.; Chauhan, S.M.S. Cobalt(II) Phthalocyanine Catalyzed One-Pot Synthesis of 2-Substituted Benzimidazoles, Benzothiazoles and Benzoxazoles from Substituted Benzyl Alcohols, ChemistrySelect, 2017, 2,7135-7140.
7. **Bio-Sketch:** Dr. Uma Narang obtained her B.Sc. (Hons.) Chemistry degree in 2010 and M.Sc. degree in Organic Chemistry in 2012 from Hindu College, University of Delhi. She was honored with science meritorious award by faculty of science, University of Delhi, for securing a university position. After completing her M.Sc., she joined Prof. S.M.S. Chauhan's research group in Department of Chemistry, University of Delhi. She was awarded with CSIR-Junior Research Fellowship (JRF) which further got promoted to Senior Research Fellowship (SRF). She received her Ph.D. degree in 2018 from the University of Delhi in Organic Chemistry on “Synthesis, Reactions and Applications of Selected Newer Functional Porphyrinoids”. She has seven research papers published in national and international journals, one book published at national level and poster presentations in eleven conferences & seminars. She started her academic career in

2018 as an assistant professor in Kirori Mal College, University of Delhi. Thereafter, she moved to Shivaji College, University of Delhi and worked there from 2019-2021. She has organized various conferences, seminars, workshops and training programmes at national level. She has also served N.S.S. faculty at Shivaji college. In June, 2021, she joined NSUT as an assistant professor.

4.6 Dr. Nancy Gupta

1. Designation, Qualifications: Assistant Professor, Ph.D.
2. Areas of Interest: Fluorescence spectroscopy, nanomaterials, nano clusters, materials Chemistry
3. E-mail: nancy.iitb@gmail.com, nancy@nsut.ac.in
4. Phone: -91- 9076252741
5. Home Page: <http://www.nsit.ac.in/faculty/ng1/>
6. Selected Publications:



- a. Singhal, N.; Datta, A. Reversible Tuning of Chemical Structure of Nafion Cast Film by Heat and Acid Treatment. *J. Phys. Chem. B* (2014) 119, 2395-2403.
 - b. Singhal, N.; Datta, A. Excited State Proton Transfer and Conformational Relaxation of 4PBI in Nafion Films. *ChemPhysChem* (2016) 17, 1-7.
 - c. Singhal, N.*; Chakraborty, R. Ghosh, P. Nag, A.* Low-Bandgap Cs₄CuSb₂Cl₁₂ Layered Double Perovskite: Synthesis, Reversible Thermal Changes, and Magnetic Interaction. *Chem-Asian J.* (2018) 13, 2085 –2092 (*corresponding authors).
7. **Bio-Sketch:** Dr. Nancy Gupta obtained her B.Sc. (Hons.) Chemistry in 2008 from **Hindu College, University of Delhi**. She then moved to **IIT Roorke** for Masters in Chemistry with organic chemistry as majors and completed it in 2010. After completing her M.Sc. and securing **GATE and CSIR-JRF fellowships**, she joined Prof. Anindya Datta's group in department of Chemistry at **IIT Bombay** to pursue PhD and completed it in March 2016. She has studied the micro environment of Nafion membrane and thin films with the help of photophysical properties of fluorescent dyes incorporated in the films and membrane. She has three publications from her thesis projects and one publication from collaboration with scientists from Bhabha Atomic Research Center (BARC). She then joined Prof. Angshuman Nag's group at **IISER, Pune** for post doctoral research to synthesize and study semiconductor nano and bulk materials having photovoltaic applications. She has two publications from her postdoctoral work. All her publications are in reputed international journals. During research career she has presented her work in several national and international conferences. After postdoctoral research, she joined an accelerator program **Entrepreneur First** in Bangalore to explore market size and utility of her ideas which could be converted to a potential start up. After finding the ideas are in a nascent

state of research and needs some years of intense research to bring them in the market, she joined Thermo Fisher Scientific to lead the content marketing and aggregator business of the organization. In June, 2021, she joined **NSUT** as an assistant professor.

5. Laboratory Infrastructure

5.1 Chemistry Lab

The department aims to provide state-of-art knowledge and practical skills to students in the diverse subjects of Applied Chemistry and Organic Chemistry. Facilitating R&D activities at UG & Ph.D. levels are the prime concern. The faculty supervises Ph.D. and projects in medicinal chemistry, bio-nano-interface, bio-active agents, wound dressings and hydrogels etc. Types of equipment available in the lab are Thermo Stat, Rotatory Evapometer fitted with chiller, pH meter, muffle furnace, UV spectrophotometer, Bio-Safety chamber and fume hood etc.



5.2 Polymer Lab

Existing polymer lab in the Chemistry Department is a fine blend of Polymer Chemistry, Polymer Technology and Pure and Applied Chemistry. Research & Testing facility available are Differential Scanning Calorimeter, Rheometer, Compression Molding, Spin Coating Unit, Lifolizer, 4-Probe System, Muffle Furnace, Universal Testing Machine and Impact Tester etc.

6. ELIGIBILITY FOR ADMISSION TO THE PhD PROGRAMME.

Candidates having the degree of M.Sc. /M.Tech/ M. Phil in Chemistry, Polymer Science and Technology, Applied Chemistry, Environmental Science, Material Sciences or any equivalent branch of Chemistry.

7 SYLLABUS FOR WRITTEN TEST:

The entrance test shall consist of 100 multiple choice questions. There shall be no negative marking. 50 questions shall be based on Research Aptitude/Methodology which shall include quantitative methods/computer applications, experimental techniques etc. and 50 questions shall be subject specific. The test shall be of Two hours.

Part A Research Aptitude/Methodology:

Unit-1 Research Aptitude

- Research: Meaning, Types, and Characteristics, Positivism and Post-positivistic approach to research.
- Methods of Research: Experimental, Descriptive, Historical, Qualitative and Quantitative methods.
- Steps of Research.
- Thesis and Article writing: Format and styles of referencing.
- Application of ICT in research.
- Research ethics.

Unit-2 Comprehension & Communication

- A passage of text be given. Questions be asked from the passage to be answered.
- Communication: Meaning, types and characteristics of communication.
- Effective communication: Verbal and Non-verbal, Inter-Cultural and group communications, Classroom communication.
- Barriers to effective communication.
- Mass-Media and Society.

Unit-3 Mathematical Reasoning and Aptitude

- Types of reasoning.
- Number series, Letter series, Codes and Relationships.
- Mathematical Aptitude (Fraction, Time & Distance, Ratio, Proportion and Percentage, Profit and Loss, Interest and Discounting, Averages etc.) Unit-VI Logical Reasoning
- Understanding the structure of arguments: argument forms, structure of categorical propositions, Mood and Figure, Formal and Informal fallacies, Uses of language, Connotations and denotations of terms, Classical square of opposition.
- Evaluating and distinguishing deductive and inductive reasoning.
- Analogies.
- Venn diagram: Simple and multiple use for establishing validity of arguments.

Unit-4 Data Interpretation

- Sources, acquisition and classification of Data.
- Quantitative and Qualitative Data.
- Graphical representation (Bar-chart, Histograms, Pie-chart, Table-chart and Line-chart) and mapping of Data.
- Data Interpretation.
- Data and Governance.

Unit-5 Information and Communication Technology (ICT)

- ICT: General abbreviations and terminology.
- Basics of Internet, Intranet, E-mail, Audio and Video-conferencing.
- Digital initiatives in higher education.
- ICT and Governance.

NOTE: (i) Equal number of questions are to be set from each Unit.

(ii) Whenever graphical/pictorial question(s) are set for sighted candidates, a passage followed by equal number of questions and weightage be set for visually impaired candidates.

Part B: Department Specific Subject:**UNIT 1: Physical Chemistry**

Postulates of quantum mechanics, Time dependent and time independent Schrödinger equations. Born interpretation. Particle in a box. Harmonic oscillator. Rigid rotor. Hydrogen atom: atomic orbitals. Multi-electron atoms: orbital approximation. Variation and first order perturbation techniques. Chemical bonding: Valence bond theory and LCAO-MO theory. Hybrid orbitals. Applications of LCAO-MOT to H_2^+ , H_2 and other homonuclear diatomic molecules, heteronuclear diatomic molecules like HF, CO, NO, and to simple delocalized π - electron systems. Hückel approximation and its application to annular π - electron systems. Symmetry elements and operations. Point groups and character tables. Origin of selection rules for rotational, vibrational, electronic and Raman spectroscopy of diatomic and polyatomic molecules. Einstein coefficients. Relationship of transition moment integral with molar extinction coefficient and oscillator strength. Basic principles of nuclear magnetic resonance: nuclear g factor, chemical shift, nuclear coupling. Polymer Characterization: Solubility and swelling, concept of average molecular weight, determination of number average, weight average, viscosity average and Z-average molecular weights, polymer crystallinity, analysis of polymers using IR, XRD, thermal (DSC, DMTA, TGA), microscopic (optical and electronic) techniques.

Equilibrium

Laws of thermodynamics. Standard states. Thermochemistry. Thermodynamic functions and their relationships: Gibbs-Helmholtz and Maxwell relations, van't Hoff equation. Criteria of spontaneity and equilibrium. Absolute entropy. Partial molar quantities. Thermodynamics of mixing. Chemical potential. Fugacity, activity and activity coefficients. Chemical equilibria. Dependence of equilibrium constant on temperature and pressure. Non-ideal solutions. Ionic mobility and conductivity. Debye-Hückel limiting law. Debye-Hückel-Onsager equation. Standard electrode potentials and electrochemical cells. Potentiometric and conductometric titrations. Phase rule. Clausius Clapeyron equation. Phase diagram of one component systems: CO₂, H₂O, S; two component systems: liquid-vapour, liquid-liquid and solid-liquid systems. Fractional distillation. Azeotropes and eutectics. Statistical thermodynamics: microcanonical and canonical ensembles, Boltzmann distribution, partition functions and thermodynamic properties.

Kinetics

Transition state theory: Eyring equation, thermodynamic aspects. Potential energy surfaces and classical trajectories. Elementary, parallel, opposing and consecutive reactions. Steady state approximation. Mechanisms of complex reactions. Unimolecular reactions. Kinetics of polymerization and enzyme catalysis. Fast reaction kinetics: relaxation and flow methods. Kinetics of photochemical and photophysical processes.

Surfaces and Interfaces: Physisorption and chemisorption. Langmuir, Freundlich and BET isotherms. Surface catalysis: Langmuir-Hinshelwood mechanism. Surface tension, viscosity. Self-assembly. Physical chemistry of colloids, micelles and macromolecules.

UNIT2 : Inorganic Chemistry

Transition Elements: Coordination chemistry: Structure and isomerism, theories of bonding (VBT, CFT, and MOT). Energy level diagrams in various crystal fields, CFSE, applications of CFT, Jahn-Teller distortion. Electronic spectra of transition metal complexes: spectroscopic term symbols, selection rules, Orgel diagrams, charge-transfer spectra. Magnetic properties of transition metal complexes. Reaction mechanisms: kinetic and thermodynamic stability, substitution and redox reactions.

Lanthanides and Actinides: Recovery. Periodic properties, spectra and magnetic properties.

Organometallics: 18-Electron rule; metal-alkyl, metal-carbonyl, metal-olefin and metal carbene complexes and metallocenes. Fluxionality in organometallic complexes. Types of organometallic reactions. Homogeneous catalysis - Hydrogenation, hydroformylation, acetic acid synthesis,

metathesis and olefin oxidation. Heterogeneous catalysis - Fischer-Tropsch reaction, Ziegler-Natta polymerization.

Radioactivity: Decay processes, half-life of radioactive elements, fission and fusion processes.

Bioinorganic Chemistry: Ion (Na^+ and K^+) transport, oxygen binding, transport and utilization, electron transfer reactions, nitrogen fixation, metalloenzymes containing magnesium, molybdenum, iron, cobalt, copper and zinc.

Solids: Crystal systems and lattices, Miller planes, crystal packing, crystal defects, Bragg's law, ionic crystals, structures of AX, AX₂, ABX₃ type compounds, spinels, band theory, metals and semiconductors.

UNIT 3: Organic Chemistry

Stereochemistry: Chirality of organic molecules with or without chiral centres and determination of their absolute configurations. Relative stereochemistry in compounds having more than one stereogenic centre. Homotopic, enantiotopic and diastereotopic atoms, groups and faces. Stereoselective and stereospecific synthesis. Conformational analysis of acyclic and cyclic compounds. Geometrical isomerism. Configurational and conformational effects, and neighbouring group participation on reactivity and selectivity/specificity.

Reaction Mechanisms: Basic mechanistic concepts – kinetic versus thermodynamic control, Hammond's postulate and Curtin-Hammett principle. Methods of determining reaction mechanisms through identification of products, intermediates and isotopic labeling. Nucleophilic and electrophilic substitution reactions (both aromatic and aliphatic). Addition reactions to carbon-carbon and carbon-heteroatom (N,O) multiple bonds. Elimination reactions. Reactive intermediates – carbocations, carbanions, carbenes, nitrenes, arynes and free radicals. Molecular rearrangements involving electron deficient atoms.

Organic Synthesis: Synthesis, reactions, mechanisms and selectivity involving the following classes of compounds – alkenes, alkynes, arenes, alcohols, phenols, aldehydes, ketones, carboxylic acids, esters, nitriles, halides, nitro compounds, amines and amides. Uses of Mg, Li, Cu, B, Zn and Si based reagents in organic synthesis. Carbon-carbon bond formation through coupling reactions - Heck, Suzuki, Stille and Sonogoshira. Concepts of multistep synthesis - retrosynthetic analysis, strategic disconnections, synthons and synthetic equivalents. Umpolung reactivity – formyl and acyl anion equivalents. Selectivity in organic synthesis – chemo-, regio- and stereoselectivity. Protection and deprotection of functional groups. Concepts of asymmetric synthesis – resolution (including enzymatic), desymmetrization

and use of chiral auxiliaries. Carbon-carbon bond forming reactions through enolates (including boron enolates), enamines and silylenolethers. Michael addition reaction. Stereoselective addition to C=O groups (Cram and Felkin-Anh models).

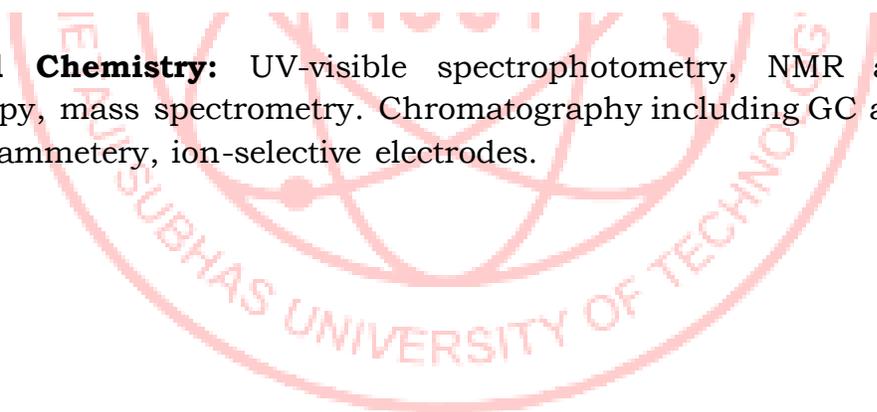
Chemistry of high polymers: Monomers, functionality, degree of polymerizations, polymerization methods: block and graft copolymers, techniques for copolymerization-bulk, solution, suspension, emulsion. Synthesis and properties of commodity and engineering plastics, thermosetting polymers, natural and synthetic, silicone etc. Polymer blends and composites, blend miscibility-miscible and immiscible blends, long and short fibre reinforced composites, polymer compounding, polymer rheology, flow of Newtonian and non-Newtonian fluids, mechanical models, control of rheological characteristics through compounding, basic techniques of polymer processing and polymer testing

Heterocyclic Compounds: Structure, preparation, properties and reactions of furan, pyrrole, thiophene, pyridine, indole, quinoline and isoquinoline.

Biomolecules: Structure, properties and reactions of mono- and disaccharides, physicochemical properties of amino acids, chemical synthesis of peptides, structural features of proteins, nucleic acids, steroids, terpenoids, carotenoids, and alkaloids.

UNIT 4:

Analytical Chemistry: UV-visible spectrophotometry, NMR and ESR spectroscopy, mass spectrometry. Chromatography including GC and HPLC Cyclic voltammetry, ion-selective electrodes.



6.7 FACULTY OF HUMANITIES AND SOCIAL SCIENCES

6.7.1 DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES (MAIN AND EAST CAMPUS)

1. The Department

The Department of Humanities and Social Sciences (HSS), earlier a part of the erstwhile School of Applied Sciences and Humanities, came into existence on 16th December, 2013. The objective of the Department is to enhance the language skills of the students not only for academic and professional purposes but also for real life situations. The emphasis in this subject is to expose the students to samples of English literature and language adding to the literary and cultural dimensions as well as to nurture and encourage creativity in the students. Various electives in Philosophy, Psychology and Sociology deal with moral reasoning and analysis, values, responsibilities and justice; stress management and organizational behavior; and relationships among individuals in society, community organization and social welfare respectively.

2. Courses Offered

The Department runs a common English language programme at its basic level through the first and second semesters. It also offers many elective job specific subjects like Soft Skills and Personality Development, Sociology & Development, Environment & Society to name a few. As part of the transition to a University, the future plans of the Department are running Masters in English Literature, Language & Communication (MLLC), Certificate Course in Professional English (CPE), as well as having an operating Language Lab to help learners to excel in English language practice. Similarly post graduate and undergraduate programmes in Psychology, Economics & Philosophy are underway as all these disciplines will focus on skill development as well as on opening up job opportunities. Short and Long Term Programmes in Spoken English and Personality Development to benefit those interested in English Language Training as a component of skill development.

3. Areas of Research & Vacancies:

English Language & Literature, Indian Writing in English, English Language Teaching

3.1 Tentative Seats:

For the session 2022-23 (Even semester) the maximum number of seats in the Department of Humanities and Social Sciences (HSS) are limited to

- (i) **Seats with university fellowship : Nil**
- (ii) **Seats without university fellowship : Nil**

The University reserves the right to change the number of seats.

***The table below indicates the maximum number of vacancies available in various areas of research. However, the total number of seats are as given above**

Sl No	Faculty	Maximum number of vacancies	
		With Univ. Fellowship (TRF)	Without Univ. Fellowship Self-Sponsored, UGC, CSIR, DST RF and others
1.	--	Nil	Nil

4. Faculty Profile

4.1 Name: Dr Tanushree Choudhary

1. **Designation:** Professor & Head, Humanities & Social Sciences (HSS)
2. **Qualifications:** PhD, MPhil, MA (Linguistics), MA (English)
3. **Email:** tanushreensut@gmail.com, tanushreensit@gmail.com
4. **Phone:** 011 25000257; 9205475096
5. **Home Page:** www.tanushreechoudhary.com
6. **Illustrative Areas of Research (but not limited to):** English Language Teaching, English Language & Literature, Indian Writing in English



Selected Publications:

- a. Selection of Teaching Material for undergraduate Students in Engineering Stream. Journal of Teaching and Research in English Literature. Special Issue. 2011.

- b. Acquisition of Meaning in Multilingual Contexts. In Narang, Vaishna. Issues in Learning Theories and Pedagogical Practices. Vol II. 352-378. Orient Blackswan 2013.
- c. Women Power in Salman's Rushdie's 'East'. International Journal of English and Literature. April 2015. Online 2249-8028. Print 2249-6912.

7. **Biosketch:** With MA in both English and Linguistics and M Phil (Linguistics, University of Delhi) followed by Ph D in Child Language Acquisition (Department of Linguistics, University of Delhi), she is teaching English to undergraduate engineering students at Netaji Subhas University of Technology (NSUT), for the past 19 years. Her overall contribution to teaching at undergraduate level including other colleges of Delhi University is around 24 years. With a number of papers in English Language teaching, she also has papers in English Literature and creative writing. Her debut book 'Five Short Stories: Translations from Munshi Premchand in 2014 is a fledgling step in the world of translation and publishing. Another book on translation from Maithili to English called 'Seven Short Stories: Stories Translated from Dr Hari Mohan Jha in 2016 is another ambitious work in the interplay of languages.

Aiming at a general improvement in oral and written skills, she finds translation from one language to another as the real test for a speaker of a number of languages. With increased global demand for good English communication skills, honing spoken skills in engineering graduates is her forte and mission. Keeping the interests of the students in mind, she has reviewed and revised the existing syllabus as per the needs today. Having functioned as the Faculty-in-Charge of the Debating Society of NSIT for quite many years, she finds it an extension of her aim of developing good communication skills in her students, apart from it being an exercise in coordination, competition and management capabilities for the participants and hosts. Another society 'Intagliare' has taken shape under her guidance for students willing to improve their professional and academic pursuits. Apart from academic responsibilities, she has also performed important administrative duties like holding the office of the PRO, NSIT (erstwhile) taking charge of the printing of official publications. Another responsibility is having held the responsibility of girls' hostel twice.

4.2 Dr. Prasanta Kumar Bhuyan

1. **Designation:** Assistant Professor
2. **Qualification:** M.A. (Sociology & Philosophy), M. Phil., Ph.D.
3. **Area of Interest:** Disability studies, conservation of forest (in reference to JFM and CFM) and Sociology of development in reference to different issues of development, displacement and rehabilitation.
4. **Email:** prasantabhuyan68@gmail.com
5. **Phone:** 7008022775
6. **Home page:** <http://www.nsit.ac.in/faculty/www.nsit.ac.in/faculty/prb/>



7. Bio-Sketch: Dr. Prasanta Kumar Bhuyan is an Assistant Professor in the department of Humanities and Social sciences. He did his Ph.D, M. Phil and MA (Sociology) from JNU New Delhi and MA(Philosophy) from Utkal University, Bhubaneshwar, Odisha. He worked with many leading NGOs, like Odisha Association for the Blind, Progressive Union of Visually Handicapped for Fertility and National Institute for Differently Abled, in the state of Odisha for the welfare of PWDs. He also represented on behalf of persons with disability to state coordination committee and state executive committee of government of Odisha. he also contributed as member to various sub-committee government of Odisha in formulating PWD's welfare policies. On different occasions he also organized state and national level seminar and workshop on disability studies/disability welfare and gave talks on different disabilities related issues on behalf of Odisha Association for the Blind. At present, he holds the post of the president of Odisha Association for the Blind and he is also member to different state level and national level NGOs working in the area of disability studies and disability welfare. His major academic areas of interest are disability studies, conservation of forest (in reference to JFM and CFM) and Sociology of development in reference to different issues of development, displacement and rehabilitation.

4.3 Dr. Satadru Chatterjee

1. Designation, Qualifications: Assistant Professor, PhD.
2. Area of interest: Theory, Popular Culture, Culture Studies and Contemporary World Literature
3. Email ID: satadruchatterjee88@gmail.com
4. Phone Number 011-21210167
5. Home Page: <http://aiactr.ac.in/index.php/academics/faculty-profile/ash-faculty-link/5783-satadru-chatterjee>

6. List of Publications

Research Methodology (M. Phil English) BRABU, Contributing Author, Vikas Publishing House Pvt. Ltd. ISBN: 9789325993136

7. **Bio-Sketch:** Satadru Chatterjee is currently working as an Assistant Professor of English & Communication Skills at NSUT. He has previously taught for over four years at the English Departments of various Delhi University Colleges including Miranda House and Ramjas College. He was awarded his Ph. D on "License to Frame: Representation of the Political Other in James Bond Novels" in 2019 from the Department of English, Jamia Millia Islamia from where he had obtained his Master's Degree in English in 2011. He completed B.A. (Hons) English from St. Joseph's College, Darjeeling, North Bengal University in 2009. His areas of interest are Literary Theory, Popular Culture, Culture Studies and Contemporary World Literatures.

4.4 Dr. Pradeep Kumar Chaswal (East Campus)

1. Designation, Qualifications: Assistant Professor, PhD.
2. Area of interest: American Literature, British Literature, Indian Writing in English, Communication Skills, Personality Development, Language Lab
3. Email: chaswal.pradeep@gmail.com
4. Phone: 011-21210167
5. Home Page: <http://aiactr.ac.in/index.php/academics/faculty-profile/ash-faculty-link>
6. Selected Publications



- a. Chaswal, Pradeep. "A Study of O'Neill's The Iceman Cometh in the Light of Pipe Dreams." Shodhdhara. 6:1. Jan. 2018. ISSN 2320-2726.
 - b. Chaswal, Pradeep and Deepak Chaswal. "English for Business Purposes (EBP) in the age of Globalization" Journal of Engineering & Technology Education, 12:1, January - June, 2018. ISSN 2229-631X
 - c. Chaswal, Deepak and Pradeep Chaswal. "Holocaust and loss of liberal human values in Arthur Miller's Incident at Vichy: A critical analysis of State Power vs. Individual Conscience." Impressions – A Bi-annual Refereed e- Journal of English Studies. 10:2. July 2016. ISSN 0974-892X.
7. Bio-Sketch: After being selected by prestigious Union Public Service Commission, New Delhi, Dr. Pradeep Kumar Chaswal is presently serving

as Assistant Professor in the Department of Applied Sciences and Humanities, AIACTR, Govt. of NCT of Delhi. He has a rich experience of 14 years in teaching, research and mentoring students. Dr.Chaswal has published and presented a large number of research papers in reputed national and international journals, seminars and conferences. His research areas of interest include American Literature, British Literature, Indian Writing in English, Communication Skills, Personality Development and Language Lab. His poems have got published in international anthologies, journals and magazines.

5. Language Laboratory

A fully equipped multimedia interactive language lab with a maximum capacity of 75 students has been set up recently. The software Sanako Study 1200 with features like group discussion, round table discussion, pronunciation activities, 100 hours of English content along with good quality headphones have been installed in the lab. As of date 30 all in one computers have been set up with the rest of the computers in the pipeline.



6. ELIGIBILITY FOR ADMISSION TO THE PhD PROGRAMME.

Candidates having the degree of MA/MPhil in English or Linguistics from a recognized university.

7 SYLLABUS FOR WRITTEN TEST:

The entrance test shall consist of 100 multiple choice questions. There shall be no negative marking. 50 questions shall be based on Research Aptitude/Methodology which shall include quantitative methods/computer applications, experimental techniques etc. and 50 questions shall be subject specific. The test shall be of Two hours.

Part A Research Aptitude/Methodology:

Unit-1 Research Aptitude

- Research: Meaning, Types, and Characteristics, Positivism and Post-positivistic approach to research.
- Methods of Research: Experimental, Descriptive, Historical, Qualitative and Quantitative methods.
- Steps of Research.
- Thesis and Article writing: Format and styles of referencing.
- Application of ICT in research.
- Research ethics.

Unit-2 Comprehension & Communication

- A passage of text be given. Questions be asked from the passage to be answered.
- Communication: Meaning, types and characteristics of communication.
- Effective communication: Verbal and Non-verbal, Inter-Cultural and group communications, Classroom communication.
- Barriers to effective communication.
- Mass-Media and Society.

Unit-3 Mathematical Reasoning and Aptitude

- Types of reasoning.
- Number series, Letter series, Codes and Relationships.
- Mathematical Aptitude (Fraction, Time & Distance, Ratio, Proportion and Percentage, Profit and Loss, Interest and Discounting, Averages etc.) Unit-VI Logical Reasoning
- Understanding the structure of arguments: argument forms, structure of categorical propositions, Mood and Figure, Formal and Informal fallacies, Uses of language, Connotations and denotations of terms, Classical square of opposition.
- Evaluating and distinguishing deductive and inductive reasoning.
- Analogies.
- Venn diagram: Simple and multiple use for establishing validity of arguments.

Unit-4 Data Interpretation

- Sources, acquisition and classification of Data.
- Quantitative and Qualitative Data.
- Graphical representation (Bar-chart, Histograms, Pie-chart, Table-chart and Line-chart) and mapping of Data.
- Data Interpretation.
- Data and Governance.

Unit-5 Information and Communication Technology (ICT)

- ICT: General abbreviations and terminology.
- Basics of Internet, Intranet, E-mail, Audio and Video-conferencing.
- Digital initiatives in higher education.
- ICT and Governance.

NOTE: (i) Equal number of questions are to be set from each Unit.
(ii) Whenever graphical/pictorial question(s) are set for sighted candidates, a passage followed by equal number of questions and weightage be set for visually impaired candidates.

Part B: Department Specific Subject:

- UNIT 1** : Literary Comprehension
UNIT 2 : The Renaissance.
UNIT3 : Jacobean to Restoration Periods.
UNIT 4 : Augustan Age 18th Century Literature.
UNIT 5 : Romantic Period.
UNIT 6 : Victorian and Pre – Raphaelites.
UNIT 7 : Modern British Literature.
UNIT8 : Contemporary British Literature.
UNIT9 : Literary Theory and Criticism up to T. S. Eliot.
UNIT10 : Contemporary Theory.
UNIT11 : Indian Writing in English and Indian Literature in English Translation
UNIT12 : Phonetics & Morphology: Different kinds, mechanism of Speech production, articulation, classification of sounds, secondary articulation & coarticulation, acoustic phonetics. phonemics- phone, allophone, contrast & complementary distribution. Generative Phonology: Types of phonological representation, phonological rules, distinctive features(major class, manner, place).Types of morphemes, Morphological Processes, Morphology-Syntax Interface
UNIT13: Language Contact: Bilingualism, bilingual proficiency, multilingualism, code mixing & switching, effects of bilingualism, language loyalty, maintenance & shift. Language convergence, pidgins & creoles.

Linguistic variability, language & identity, language and identity, linguistic variables and their linguistic, social & psychological dimensions, language and social inequality, speech community, language boundaries, communicative competence, speech event and its components, Gricean maxims & their implications, pragmatics of politeness

UNIT14: Language Teaching Analysis-goals of language teaching, first & second language acquisition, processes of learning, behaviourist & cognitive theories of language learning (Skinner, Piaget, Chomsky). role of teacher and teacher training, language proficiency in multilingual settings, Contrastive & Error analysis, interlanguage, BICS, CALP, types of tests & their validity.

UNIT15: Literacy, role of language in literacy, govt & state initiatives, literacy drives. Role of language in mass communication, impact of mass media on language, types of language used in mass media (news, advertising, editorials).

6.8 FACULTY OF MANAGEMENT STUDIES

6.8.1 DEPARTMENT OF MANAGEMENT STUDIES

1. The Department

The department was established in 2019 to provide quality education in the field of management. The vision of the department is to develop the management skills of young individuals from various sections of society and support them to be the business leaders of tomorrow. The entrepreneurship stream of the department is constantly indulged in promoting entrepreneurial culture in students through experience learning, guided /capstone projects, action learning sessions, residency programs at start-ups and skill development modules. The program has been conceptualized with valuable insights and collaborative inputs from industry and academia experts. The major portion of the curriculum carries practical components delivered beyond the classroom teaching.

2. Courses Offered

The department began following programmes from the academic session July, 2019.

- Three-Year Full-Time Bachelor of Business Administration (BBA) programme
- Two-Year Full-Time Master of Business Administration (MBA) programme.
- Two-Year Full-Time Master of Business Administration in Innovation, Entrepreneurship, and Venture Development (MBA-IEV) programme.
- Doctor of Philosophy (Ph.D.)

Department of Management studies also offers elective courses in diverse domains of management to engineering UG and PG students at NSUT.

3. Areas of Research and Available Vacancies

Presently, the faculty is involved in the following research areas of Management .

A. MANAGEMENT

(Syllabus Of Subject Written Test Is attached)

MARKETING

- **Customer Experience**

Customer experience in B2C, Customer engagement, customer communities, brand experience, Customer co-creation, service dominant logic (SDL), Artificial Intelligence (AI) and Service, and technology-based services (Apps).

- **Offline and Online Retailing**

Modeling customer-retailer interactions across multiple interfaces and touchpoints, future of brick-and-mortar retailing, mobile marketing, social media and retailing.

- **Consumer Behaviour**

Buying decision process, post-purchase evaluation, and technologies and consumer decision making.

- **Customer Relationship Management**

Customer lifetime value, CRM in customer contact centers, CRM in Business-to Business markets, and technology developments in CRM.

OPERATIONS

Operational Research, Artificial Intelligence, Entrepreneurship, Decision Research, Industrial Management/Engineering.

HUMAN RESOURCE MANAGEMENT

Organizational Behavior, HRM Information Technology and Education, Higher Education and Employment.

ENTREPRENEURSHIP AND INNOVATION MANAGEMENT

Innovation management, new product development, design thinking.

FINANCE

Financial Market Integration, Investment Management, Derivatives, Financial Modelling, International Finance, Strategic Corporate Finance, Capital Market operations, Green Finance, Social Finance, Supply Chain Finance, Financial Management, Sustainable Finance.

ACCOUNTING

Financial Accounting, Management Accounting, Cost Volume Profit Analysis.

B. ENTREPRENEURSHIP AND INNOVATION MANAGEMENT :

(Syllabus Of Subject Written Test Is attached)

Innovation management, new product development, design thinking.

3.1 Tentative Seats:

For the session 2022-23 (Even semester) the maximum number of tentative seats in the

Department of Management studies (MBA and MBA-IEV) are limited to

(i) Vacancies with university fellowship: 02

(ii) Vacancies without university fellowship: Nil

* University reserves the right to change the number of seats

* The table below indicates the maximum number of vacancies available in various areas of research.

S. No.	Name of Faculty	Area of Research	No. of candidates to be taken in coming session	
			With Univ. Fellowship	Without Univ. Fellowship
1.	Dr. Renu Ghosh	Finance and accounting	1	Nil

2.	Dr. Neha Saini	Financial Management	Nil	Nil
3.	Dr. Aastha Verma	Marketing	Nil	Nil
4.	Dr. Shiksha Kushwah	Marketing	Nil	Nil
5.	Dr. Sameer Gokarn	Operations	Nil	Nil
6.	Dr. Pankaj Deshwal	-	1	Nil
7.	Prof. S. K. Jain	-	Nil	Nil
8.	Prof. Prerna Gaur	-	Nil	Nil
9.	Prof. Vijayant Agarwal	-	Nil	Nil
	Total Vacancy	* The total number of vacancies advertised are tentative.	02	NIL

4. Faculty Profile

4.1. Prof. Jyotsna Singh

1. Designation : Head, DMS,
2. E-mail: jyotsna.singh@nsut.ac.in
3. Phone: +91 9205475032
4. Home Page: <https://jyotsna-singh.com/>

5. List of Publications:

(i) Singh, R., Parthasarathy, H. & Singh, J. Quantum image restoration based on Hudson–Parthasarathy Schrodinger equation, Quantum Inf Process (2019), Springer, 18: 351.

(ii) Shilpa Dua, Jyotsna Singh, Harish Parthasarathy, “Detection and localization of forgery using statistics of DCT and Fourier components ” Signal Processing: Image Communication, Elsevier, Volume 82, March 2020.

<https://doi.org/10.1016/j.image.2020.115778>

(iii) Pandey, V.K., Singh, J. & Parthasarathy, H. Estimating the moments of a random forcing field of 2D fluid from image sequences using energy minimisation method. Arab. J. Math., Springer,



- 10,201–210 (2021). <https://doi.org/10.1007/s40065-020-00306-w>
6. **Bio-Sketch:** Prof. Jyotsna Singh received her B. Tech degree in Electronics from Harcourt Butler Technological Institute, Kanpur, India in 1995 and M. Tech degree in Signal Processing from Netaji Subhas Institute of Technology, Delhi University, Delhi, India, in 2001. She received her Ph. D degree in Electronics and Communication Engineering from the University of Delhi, India. She is working as Professor in Netaji Subhas University of Technology, New Delhi, India for the last 20 years. She is senior member of IEEE and life member of IETE. She has also been in the technical program committees of various international conferences such as INDICON, SPIN, ICACCI, CCAIS etc. She has published papers in more than 50 Journals and conferences. She is also holding other administrative responsibilities at NSUT as Coordinator, NIRF, Deputy Superintendent of Examination, NSIT, Chairperson, management admissions CMAC-2021, Member, Grievance redressal committee, Member of committee for New Education policy.

4.2 Dr. Pankaj Deshwal

1. Designation, Qualifications: Assistant Professor, Ph.D
2. Areas of Interest: Customer experience, Offline and online retailing, Consumer behavior, Digital marketing, and Customer Relationship Management.
3. List of Publications:
 - a. Deshwal, Pankaj, and Prasanta Bhuyan. "Cancer patient service experience and satisfaction", International Journal of Healthcare Management, Vol. 11, Issue 2, pp. 88-95, 2016. (Taylor & Francis)
 - b. Deshwal, Pankaj. "Customer experience quality and demographic variables (age, gender, education level, and family income) in retail stores" International Journal of Retail & Distribution Management, Vol. 44, Issue 9, pp. 940-955, 2016. (Emerald)
 - c. Deshwal, Pankaj, Vini Ranjan, and Geetika Mittal. "College clinic service quality and patient satisfaction", International Journal of Health Care Quality Assurance, Vol. 27, Issue 6, pp. 519-530, 2014. (Emerald)
4. E-mail: pankajdeshwal@nsut.ac.in
5. Phone: 09013246582
6. Home Page: <http://www.nsit.ac.in/faculty/pd/>
7. **Bio-Sketch:** Dr. Pankaj Deshwal is an Assistant Professor at the Department of Management Studies, Netaji Subhas University of Technology (formerly Netaji Subhas Institute of Technology), New Delhi.



He has completed his Ph.D. from University of Delhi. He has published more than 40 research papers in reputed International Journals, Proceedings of International Conferences, and Books chapters. He is a member of American Marketing Association, America, (Chicago, USA), Society of Operations Management (India), Indian Commerce Association (India), Indian Society for Technical Education (New Delhi), Rural Marketing Association of India (New Delhi). His research interests are in the areas of Services Marketing, Consumer Behaviour, Digital Marketing, and Customer Relationship Management.

4.3 Dr. Neha Saini



1. Designation, Qualifications: Assistant Professor, Ph.D
2. Areas of Interest: Financial Management, Derivatives, Financial Modelling, International finance, Sustainable finance, Sustainable International finance.
3. List of Publications:
 - a. Singhania, M., & Saini, N. (2021). Demystifying pollution haven hypothesis: Role of FDI. *Journal of Business Research*, 123, 516-528. (ISSN: 0148-2963, Publisher: Science direct; Scopus **Indexed; ABDC Category: A; ABS listing: 3**).
 - b. Singhania, M. & Saini, N., Revisiting environmental degradation and economic growth nexus using autoregressive distributed lag approach, *International Journal of Productivity and Performance Management*, 69(8), 1765-1796. (ISSN:1741-0401; Publisher: Emerald Publication; **Scopus Indexed; ABDC Category: B; ABS listing: 1**).
 - c. Singhania, M. & Saini, N., Foreign Capital Inflows in Developed and Developing economies: Facts, Feature and Analysis, *International Journal of Indian Culture and Business Management*, 19(4), 465-490 (ISSN: 1753-0814; Publisher: Inderscience Publication, **(ABDC Category: C (2016); ABS listing: 1)**).
 - d. Singhania, M. & Saini, N., Performance Relevance of Environmental and Social disclosures: The role of foreign ownership, *Benchmarking: An International Journal*, 2019, 26(6), 1845-1873 (ISSN: 1463-5771; Publisher: Emerald Publication, **(Scopus Indexed; ABDC Category: B; ABS listing: 1)**).
 - e. Singhania, M. & Saini, N., Environmental Impact of Economic Growth, Emissions & FDI: Systematic Review of Reviews, *Qualitative Research in Financial Markets*, 2019, 11(1), 81-134 (ISSN: 1755-4179; Publisher:

Emerald Publication, **Scopus Indexed; ABDC Category: B; ABS listing: 1).**

4. E-mail: nehasaini5115@gmail.com

5. Phone: 9873705504

6. Home Page: <http://www.nsit.ac.in/faculty/>

7. **Bio Sketch:** Dr. Neha Saini has completed her Ph.D. in the area of Finance and International Business from Faculty of Management Studies, University of Delhi. She has done her graduation from Keshav Mahavidyalaya and post-graduation from RDIAS (GGSIPU). With the rich corporate and academic experience, she has participated in various national and international paper presentations, including IIMs, IISc, IBS-Hyderabad, Delhi School of Economics, Department of Commerce (DU) etc., including some best paper awards as well. Besides this, her publication list includes the leading journals in the area of finance, international business and sustainability.

4.4 Dr. Samir Gokarn

1. Designation, Qualifications: Assistant Professor, Ph.D

2. Areas of Interest: Food supply chain management, Business analytics, Blockchain technology in supply chains, Sustainability management, Strategic Management, Waste Management.

3. List of Publications:

- a. Gokarn, S. and Choudhary, A. (2021). Modeling the key factors influencing the reduction of food loss and waste in fresh produce supply chains. *Journal of Environmental Management*, 294, 113063 **SCIE-Indexed (Impact Factor: 5.64; Listed in A category** in the ABDC journal list (Elsevier)
- b. Gokarn, S. and Kuthambalayan, T.S. (2019). Creating sustainable fresh produce supply chains by managing uncertainties. *Journal of Cleaner Production*, 207, pp.908-919. **SCIE-Indexed (Impact Factor: 7.24; JCP** is listed as the **topmost publication** in Google Scholar's Sustainable Development category), Listed in **A category** in the ABDC journal list (Elsevier)
- c. Gokarn, S. and Kuthambalayan, T.S. (2017). Analysis of challenges inhibiting the reduction of waste in food supply chains. *Journal of Cleaner Production*, 168, pp.595-604. **SCIE-Indexed (Impact Factor:**



7.24; JCP is listed as the **topmost publication** in Google Scholar's Sustainable Development category), Listed in **A category** in the ABDC journal list. (Elsevier)

4. Email: samirgokarn@gmail.com
5. Phone: 7903019295
6. **Bio-Sketch:** Dr. Samir Gokarn is an Assistant Professor at the Department of Management Studies, Netaji Subhas University of Technology (formerly Netaji Subhas Institute of Technology), New Delhi. He has completed his Ph.D. from IIT (ISM) Dhanbad. In the year 2014, he was awarded a Bronze Medal in the course work on Research Methodology on the national level and was also awarded JRF by the UGC- India in Management Stream in the year 2012. In the area of research, he has published three papers in 'A' category journal listed in the ABDC journal list with an impact factor of 5 and above and one of the journals (JCP) is listed as the topmost

4.5 Dr. Renu Ghosh

1. Designation, Qualifications: Assistant Professor, Ph.D
2. Areas of Interest: Behavioral Finance, Financial Market Integration, Investment Management, International Finance, Capital Market operations, Social Finance, Supply Chain Finance and Accounting.
3. List of Publications:
 - a. S. Thukral, A.K. Singh, R. Ghosh and M.M. Pant, "Impact of Covid-19 Pandemic on Stock Markets: A Case Study of Selected Countries," International Journal of Monetary Economics and Finance. (ABDC Listed, Scopus Indexed)
 - b. S. Agarwal, M. Agarwal and R. Ghosh, "An Event Study Approach to Analyze the Impact of Novel Coronavirus Disease (Covid-19) on Indian Hotel & Tourism Stocks Performance," Ramanujan International Journal of Business and Research, vol. 6, 2021. (UGC Listed)
 - c. R. Ghosh, K. Latha and S. Gupta , "Interest Rate Sensitivity of Non-Banking Financial Sector in India," Vikalpa: The Journal for Decision Makers, vol. 43, no. 3, 2018.(Scopus Indexed)
 - d. K. Latha, S. Gupta and R. Ghosh, "Interest Rate Volatility and Stock Returns: A GARCH (1,1) Model," Ramanujan International Journal of Business & Research, vol. 2, 2017.(UGC Listed)



- e. K. Latha and R. Ghosh, "Performance Evaluation of Mutual Funds in India: A Case Study," Ramanujan International Journal of Business and Research, vol. 1, pp. 53-63, 2016.(UGC Listed)
- f. V. Misra and R. Ghosh, "Performance Evaluation of ULIPs in India: A Case Study," The Indian Journal of Commerce, vol. 63, no. 4, 2010. (UGC Listed)
4. E-mail: renu.ghosh@nsut.ac.in, renu20102010@gmail.com
5. Phone: 09953227203, 09811750563
6. Home Page: <http://www.nsit.ac.in/faculty/rgh/>
7. **Bio-Sketch:** Dr. Renu Ghosh is an Assistant Professor at the Department of Management Studies, Netaji Subhas University of Technology (formerly Netaji Subhas Institute of Technology), New Delhi. She did her M.Com in 2009 and M.Phil. in 2012 from the Department of Commerce, Delhi School of Economics, University of Delhi. She was awarded Ph.D. in 2016 from the Department of Commerce, Delhi School of Economics, University of Delhi in the area of finance. She has worked with Rajdhani college, University of Delhi and Dyal Singh College, Karnal before joining this department for 11 years. She has participated in national, international conferences and seminars; and presented various research papers. Various research papers authored and co-authored by her have been published in national and international journals of repute.

4.6 Dr. Aastha Verma

1. Designation Qualification – Assistant Professor, PhD.
2. Area of Interest – International Marketing, Marketing of Foreign brands, Digital Marketing. Allied Areas- Green Marketing, Waste Management, Sustainable business growth.



3. List of Publications –

- a) Vohra, A.V (2015), "Indian Consumer's materialistic value: An Examination of dimensionality and Instrument Development through Exploratory Factor Analysis", Indian Journal of Marketing, Vol 5 (11), pp.29 -41 (UGC listed & SCOPUS INDEXED & ABDC Listed).
- b) Vohra, A.V, Gupta, G (2017), "Predisposition towards foreign brands and materialism: a Quantitative assessment", Journal of Asia Business Studies, Emerald Publications, England. Vol. 11 Issue: 1, pp.41-59,

<https://doi.org/10.1108/JABS-08-2015-0144>. (SCOPUS INDEXED & ABDC listed).

c) Vohra, A.V (2016), “Materialism, Impulse Buying and Conspicuous Consumption: A Qualitative Research”, Global Business Review, Sage Publications Vol.17 (1), pp. 1 - 17..<https://doi.org/10.1177/0972150915610682> (SCOPUS INDEXED & ABDC listed).

4. Email – aastha178@gmail.com

5. Phone – 9811208423

6. Home Page –

7. Biosketch - Dr. Aastha Verma holds a PhD Degree from Faculty of Management Studies, (FMS) University of Delhi in area of Marketing. She completed her MBA from Bharti Vidyapeeth University (Pune). She has a decade long experience in industry and academics and has several article and research publications to her credit, most significant ones with Springer, Sage and Emerald group publishing. She has also participated as principal investigator in Delhi University funded college in house research projects. She has participated in the national and international conferences as author and presenter organized by IIT- Delhi, MDI Gurgaon, IIM- Kashipur, Delhi school of economics, department of commerce, Delhi University and many others. She presented one of her research paper in an international conference held in Malaysia, funded completely by Indian Council of Social Science Research (ICSSR), Government of India.

4.7 Dr. Shiksha Kushwah

1. Designation: Assistant Professor, Ph.D.

2. Areas of Interest: consumer behavior; branding; consumption communities; green consumption; energy consumption; entrepreneurial marketing; marketing innovations

3. List of Publications:



(i) Tandon, A., Dhir, A., Kaur, P., Kushwah, S., & Salo, J. (2020). Why do people buy organic food? The moderating role of environmental concerns and trust. *Journal of Retailing and Consumer Services*, 57, 102247. **(Impact factor-4.21; CiteScore-7.4, 'A' category journal)**

(ii) Tandon, A., Dhir, A., Kaur, P., Kushwah, S., & Salo, J. (2020). Behavioral reasoning perspectives on organic food purchase. *Appetite*, 154, 104786. **(Impact factor-3.60; CiteScore-3.97, 'A' category journal)**

(iii) Kushwah, S., Dhir, A., Sagar, M., & Gupta, B. (2019). Determinants of organic food consumption. A systematic literature review on motives and barriers. *Appetite*, 143, 104402. Indexed in Elsevier **(Impact factor-3.60; CiteScore-3.97, 'A' category journal)**

(iv) Kushwah, S., Dhir, A., & Sagar, M. (2019). Ethical consumption intentions and choice behavior towards organic food. Moderation role of buying and environmental concerns. *Journal of Cleaner Production*, 236, 117519. Indexed in Elsevier **(Impact factor-7.24; CiteScore-7.32)**

(v) Kushwah, S., Dhir, A., & Sagar, M. (2019). Understanding consumer resistance towards consumption of organic food. A study of ethical consumption, purchasing and choice behavior. *Food Quality and Preference*, 77, 1-14. Indexed in Elsevier **(Impact factor- 4.84; Cite Score-4.57; 'A' category journal)**

4. E-mail: shiksha@nsut.ac.in, shiksha.kushwah@gmail.com

5. Phone: 8826320775

6. Home Page:

7. **Bio-Sketch:** Dr. Shiksha Singh Kushwah is an Assistant Professor in the area of Marketing at Netaji Subhas University of Technology, Delhi. She has done her Ph.D. from the Indian Institute of Technology, Delhi. The topic of her doctoral research was "Exploring Consumption Communities: A study of Purchase Intentions and Choice Behavior". Her doctoral work published in international peer-reviewed journals. She has received a Junior Research Fellowship from University Grant Commission in 2014. She had three years of industry experience in marketing and presales profiles in the oil and gas and power industry. Prior to that, she has completed her MBA from the Army Institute of Management and Technology, Greater Noida (under Army Welfare Education Society).

4.7 Prof. S. K. Jain



1. Designation, Qualifications: Professor Emeritus, PhD
2. Areas of Interest: Managerial Economics, Entrepreneurship, Intellectual Property Rights Management
3. List of Publications:
 - a. Vinita Krishna and Sudhir K Jain (2020). “Measuring Collaboration in Open Innovation Practice of Pharmaceutical Firms: The Use of Survey and Patent Data, published in Journal of Intellectual Capital (ABDC ranked “B category, Imp. Factor 5.33 and Citescore 8.4)), Emerald Group Publishing. DOI: 10.1108/JIC-04-2020-0113
 - b. Krishna Vinita, Jain, Sudhir K and ArchanaChugh (2017). Renewal and Commercialization Aspects of Patent Management in Indian Pharmaceutical Industry in Journal of Intellectual Property Rights, Vol 22, July 2017, pp11-23 , ISSN: 0971-7544
 - c. Krishna. V and Jain, Sudhir. K (2014), “A Study of the Maintenance of Patents by the Non-Residents in India: Insights for Strategic Management of Patents” published in the International Journal of Intellectual Property Management, (ABDC rank C; Citescore 0.1) IndersciencePublications, Vol. 8, No. 3/4, 2015
4. E-mail: skjain51@hotmail.com
5. Phone: 9810211681

6. Biosketch :Prof. Sudhir K. Jain is Professor Emeritus in the Department of Management Studies, Netaji Subhash University of Technology, New Delhi. He is a renowned economist with expertise in Entrepreneurship and Intellectual Property Rights. He has been the Vice Chancellor of Shri Mata Vaishno Devi University, Katra (J&K) and Executive Director, National Institute for Entrepreneurship & Small Business Development (NIESBUD), Govt. of India. He was Head of the Department of Management Studies, I.I.T. Delhi during 2010-2012. Post-retirement from I.I.T. Delhi, he served as the First Professor at ‘Atal Bihari Vajpayee School of Management & Entrepreneurship’, Jawaharlal Nehru University, New Delhi during 2019-20. Prof. Jain has published about 200 research papers in reputed journals and conference proceedings. He has also co-authored the book ‘Managerial Economics’ jointly with Prof. H. Craig Petersen and Prof. W. C. Lewis of Utah State University (USA).

4.8 Prof. Prerna Gaur

1. Designation, Qualifications: Adjunct Faculty (Professor), PhD
2. Areas of Interest: a) Artificial Intelligence, Entrepreneurship/Marketing, Supply Chain Management
(b) Operational Research, Decision Research, Industrial management/Engineering
3. List of Publication:
 - a. Anil Kumar Yadav and Prerna Gaur, "Speed Control of an Uncertain Heavy Duty Vehicle using Improved IMC Technique," The Arabian Journal for Science and Engineering, Springer, vol. 42, no. 7, pp. 2981–2991, 2017. (SCIE, Impact Factor = 0.865).
 - b. Anil Kumar Yadav and Prerna Gaur, "Improved Self-Tuning Fuzzy Proportional–Integral Derivative Versus Fuzzy-Adaptive Proportional–Integral–Derivative for Speed Control of Nonlinear Hybrid Electric Vehicles," Journal of Computational and Nonlinear Dynamics, ASME Transactions, vol.11, no. 6, pp. 061013-061013-7, 2016. (SCIE, Impact Factor = 1.732).
 - c. Anil Kumar Yadav and Prerna Gaur, "Neuro-Fuzzy based Improved IMC for Speed Control of Nonlinear Heavy Duty Vehicles," Defence Science Journal, vol. 66, no. 6, pp. 665-672, 2016. (SCIE, Impact Factor = 0.50)
4. E-mail: prernagaur@yahoo.com
5. Phone: +91-11-25099032 (O)
6. Home Page: <https://prernagaur.wordpress.com/>



7. Bio-Sketch: B.Tech in Electrical Engineering from G.B.Pant University of Technology and Agriculture, Pantnagar in 1988, M.Tech from Delhi College of Engineering in 1996 and Ph.D. from Delhi University in the field of Artificial Intelligence and control. 6 years of Industry experience and 26 years of Teaching experience in Delhi College Engineering and NSIT, Delhi. Presently working as Director, NSUT East Campus, New Delhi, India. Guided more than 150 B.Tech and M.Tech Student guided many Ph.D. students also. She is Director, Technical Business Incubator of NSUT and NBA Co-ordinator of NSUT.

4.9 Prof. VIJYANT AGARWAL



1. Designation, Qualifications: Professor, Ph.D.
2. Areas of Interest: Operational Research, Decision Research, AI Designation Adjunct Faculty (Professor)
3. List of Publications: Three most relevant publications
 - a. Vijyant Agarwal, “Trajectory planning of redundant manipulator using fuzzy clustering method”, The International Journal of Advanced Manufacturing Technology (Springer; Impact factor 1.5), 61,727-744, July 2012.
 - b. Vijyant Agarwal, Harish Parthasarathy, “Disturbance Estimator as a State Observer with Extended Kalman Filter for Robotic Manipulator”, Nonlinear Dynamics (Springer; Impact factor: 3), 84(4), pp 1-17, 2016.
 - c. NeeluNagpal ,Vijyant Agarwal, Bharat Bhushan, “Real Time state observer based controller for stochastic robotic manipulator”, IEEE Transactions on industry applications (Impact factor: 2.937), 54(2), pp1806-1822, 2018.
4. E-mail: vijyant@nsit.ac.in
5. Phone: 9899308574
6. Home Page: www.nsit.ac.in/faculty/va

7. Bio-Sketch: Dr. Vijyant Agarwal is a Professor /Adjunct faculty in the Department. He has published over 30 research papers in the reputed National and International journals and in the proceedings of National and International Conferences. He has completed 04 DST/AICTE sponsored research projects.

4.10 Dr. Lovneesh Chanana

1. Designation, Qualifications: Adjunct Faculty, Ph.D
2. Areas of Interest: Mobile Governance
3. List of Publications:
 - (a) LovneeshChanana, Rajat Agarwal and Devendra Kumar Punia (2016), “Service Quality Parameters for Mobile Government Services in India”, Global Business Review, Sage Publications, 17(1), 2016, pp 136-146
 - (b) Vinay Kumar Nangia, Devendra Kumar Punia and LovneeshChanana (2014). “Prioritization of sectors for mobile government”, International Journal of Management, Vol. 2, No.1, 2014, pp 1-13



- (c) Mamta Sareen, LovneeshChanana and Devendra Kumar Punia (2013).
“Exploring success factors for mobile government in India”, Problems and Perspectives in Management, Volume 11, Issue 4, 2013, pp 45-52
4. E-mail: lovneesh.chanana@gmail.com
5. Phone: +91-9868009426
6. Home Page: <http://nsut.ac.in/faculty/lch/>

4.11 Dr. Mamata Sareen

1. Designation, Qualifications: Adjunct Faculty, Ph.D
2. Areas of Interest: E-commerce/E-business/Management of Information Systems (MIS)
3. List of Publications:
4. E-mail: mamtasareen1@yahoo.co.in
5. Phone: +91-9868009426
6. Home Page: <http://nsut.ac.in/faculty/msa/>



4.12 Dr. Gauri Seth

1. Designation, Qualifications: Adjunct Faculty, Ph.D
2. Areas of Interest: Economics
3. List of Publications:
4. E-mail: gauriseth.gs@gmail.com
5. Phone: 09358278555
6. Home Page: <http://www.nsit.ac.in/faculty/gst/>



5. Discipline specific eligibility criteria

(a) For MBA

List of Degrees in UG

- Any Degree

List of PG Degree

- Master's Degree in Business Administration / PGDM / C. A. / ICWA/ M. Com.

(b)For MBA (IEV)

List of Degrees in UG

- Any Degree

List of PG Degree

- MBA/M.COM/ICWA with Postgraduate diploma in entrepreneurship/ Masters degree in any discipline with specialization in Entrepreneurship/venture development/ MBA-IEV Startup/ entrepreneurship.

6 SYLLABUS FOR WRITTEN TEST:

The entrance test shall consist of 100 multiple choice questions. There shall be no negative marking. 50 questions shall be based on Research Aptitude/Methodology which shall include quantitative methods/computer applications, experimental techniques etc. and 50 questions shall be subject specific. The test shall be of Two hours.

Part A Research Aptitude/Methodology:

Unit-1 Research Aptitude

- Research: Meaning, Types, and Characteristics, Positivism and Post-positivistic approach to research.
- Methods of Research: Experimental, Descriptive, Historical, Qualitative and Quantitative methods.
- Steps of Research.
- Thesis and Article writing: Format and styles of referencing.
- Application of ICT in research.
- Research ethics.

Unit-2 Comprehension & Communication

- A passage of text be given. Questions be asked from the passage to be answered.
- Communication: Meaning, types and characteristics of communication.
- Effective communication: Verbal and Non-verbal, Inter-Cultural and group communications, Classroom communication.
- Barriers to effective communication.
- Mass-Media and Society.

Unit-3 Mathematical Reasoning and Aptitude

- Types of reasoning.
 - Number series, Letter series, Codes and Relationships.
 - Mathematical Aptitude (Fraction, Time & Distance, Ratio, Proportion and Percentage, Profit and Loss, Interest and Discounting, Averages etc.)
- ### **Unit-VI** Logical Reasoning
- Understanding the structure of arguments: argument forms, structure of categorical propositions, Mood and Figure, Formal and Informal fallacies, Uses of language, Connotations and denotations of terms, Classical square of opposition.
 - Evaluating and distinguishing deductive and inductive reasoning.
 - Analogies.
 - Venn diagram: Simple and multiple use for establishing validity of arguments.

Unit-4 Data Interpretation

- Sources, acquisition and classification of Data.
- Quantitative and Qualitative Data.
- Graphical representation (Bar-chart, Histograms, Pie-chart, Table-chart and Line-chart) and mapping of Data.
- Data Interpretation.
- Data and Governance.

Unit-5 Information and Communication Technology (ICT)

- ICT: General abbreviations and terminology.
- Basics of Internet, Intranet, E-mail, Audio and Video-conferencing.
- Digital initiatives in higher education.
- ICT and Governance.

NOTE: (i) Equal number of questions are to be set from each Unit.

(ii) Whenever graphical/pictorial question(s) are set for sighted candidates, a passage followed by equal number of questions and weightage be set for visually impaired candidates.

Part B: Department Specific Subject:

A. For Management Discipline

UNIT 1

Managerial Economics-Demand Analysis, Production Function, Cost-output relations, Market structures, Pricing theories, Advertising, Macro-economics, National Income concepts, Infrastructure-Management and Policy, Business Environment, Capital Budgeting

UNIT 2

The concept and significance of organizational behavior, Skills and roles in an organization, Classical, Neo-classical and modern theories of organizational structure, Organizational design, Understanding and Managing individual behavior personality, Perception, Values, Attitudes, Learning and Motivation. Understanding and managing group behavior, Processes, Inter-personal and group dynamics, Communication, Leadership, Managing change, Managing conflicts, Organizational development.

UNIT 3

Concepts and perspectives in HRM; HRM in changing environment, Human resource planning, Objectives, Process and Techniques, Job analysis, Job description, selecting human resources, Induction, Training and Development, Exit policy and implications, Performance appraisal and evaluation, Potential assessment, Job evaluation, Wage determination, Industrial Relations and Trade Unions, Dispute resolution and Grievance management, Labor Welfare and Social security measures.

UNIT 4

Financial management, Nature and Scope, Valuation concepts and valuation of securities, Capital budgeting decisions, Risk analysis, Capital structure and Cost of capital, Dividend policy, Determinants, Long-term and short-term financing instruments Mergers and Acquisitions

UNIT 5

Marketing environment and Environment scanning; Marketing Information Systems and Marketing research; Understanding consumer and industrial markets; Demand Measurement and Forecasting; Market Segmentation, Targeting and Positioning; Product decisions, Product mix, Product Life Cycle; New product development; Branding and Packaging; Pricing methods and strategies.

Promotion decisions—Promotion mix; Advertising; Personal selling; Channel management; Vertical marketing systems; Evaluation and control of marketing effort; Marketing of services; Customer relation management; Uses of internet as a marketing medium—other related issues like branding, market development, Advertising and retailing on the net, new issues in Marketing.

UNIT 6

Role and scope of production management; Facility location; Layout planning and analysis; Production planning and control—production process analysis; Demand forecasting for operations; Determinants of product mix; Production scheduling; Work measurement; Time and motion study; Statistical Quality

Control. Role and scope of Operations Research; Linear Programming; Sensitivity analysis; Duality; Transportation model; Inventory control; queuing theory; Decision theory; Markov analysis; PERT/CPM.

UNIT 7

Probability theory; Probability distributions—Binomial, Poisson, Normal and Exponential; Correlation and Regression analysis; Sampling theory; Sampling distributions; Tests of Hypothesis; Large and small samples; t, z, F, Chi-square tests. Use of Computers in Managerial applications: Technology issues and Data processing in organizations; Information systems; MIS and Decision Making; System analysis and design; Trends in Information Technology; Internet and Internet-based applications.

UNIT 8

Concept of corporate strategy; Components of strategy formulation; and off growth vector; BCG Model, Porter's generic strategies; Competitor analysis; Strategic dimensions and group mapping; Industry Analysis; Strategies in industry evolution, fragmentation, maturity, and decline; Competitive strategy and corporate strategy; Trans-nationalization of world economy; Managing cultural diversity; Global Entry strategies; Globalisation of financial system and services; Managing international business; Competitive advantage of nations: RTP and WTO.

UNIT 9

Concepts—Types, Characteristics; Motivation; Competencies and its development; Innovation and Entrepreneurship; Small business—Concepts Government policy for promotion of small and tiny enterprises; Process of business opportunity identification; Detailed business plan preparation; Managing small enterprises; Planning for growth; Sickness in Small Enterprises; Rehabilitation of sick enterprises; Intrapreneurship (organisational entrepreneurship).

UNIT 10

Ethics and Management system; Ethical issues and analysis in management; Value based organisations; Personal framework for ethical choices; Ethical pressure on individual in organisations; Gender issues; Ecological consciousness; Environmental ethics; Social responsibilities of business; Corporate governance and ethics.

B. For Innovation Entrepreneurship and Venture Development Discipline

Unit 1: Comprehension Passages from success stories in Entrepreneurship and start-up leadership, Current affairs related to start-ups.

Unit 2: Entrepreneurship, Social Entrepreneurship, Intrapreneurship, Entrepreneurial Characteristics, Entrepreneur Vs Manager, Entrepreneurial motivation.

Unit 3: Innovation management, diffusion of Innovation, Innovation cycle, new product development, design thinking.

Unit 4: Startup, stages of startup, ideation, pre- startup, startup and scaling up stage, start-up India program, start up concept and its support to start uyyys, start up financing, seed funding, angel investors, venture capital funding, government financial support for startups, MSME- definition and its types.

Unit 5: Government schemes and policy for start ups and MSMEs, ATAL Innovation Mission (AIM), Atal tinkering lab (ATL), Self Employment and Talent utilisation (SETU) scheme, SFURTI scheme, Intellectual property rights (IPR), Start up Intellectual property protection (SIPP), Trademark, copyright, patents, Types od companies in India and their characteristics, formation and legalities of a company.

