

विश्वेश्वरय्या राष्ट्रीय प्रौद्योगिकी संस्थान, नागपूर
VISVESVARAYA NATIONAL INSTITUTE OF TECHNOLOGY, NAGPUR



Course Book



**First Year B.Tech
2019-20**



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VISVESVARAYA NATIONAL INSTITUTE OF TECHNOLOGY, NAGPUR



Vision

To contribute effectively to the national endeavor of producing quality human resource of world class standard by developing a sustainable technical education system to meet the changing technological needs of the Country incorporating relevant social concerns and to build an environment to create and propagate innovative technologies for the economic development of the Nation.

Mission

The mission of VNIT is to achieve high standards of excellence in generating and propagating knowledge in engineering and allied disciplines. VNIT is committed to providing an education that combines rigorous academics with joy of discovery. The Institute encourages its community to engage in a dialogue with society to be able to effectively contribute for the betterment of humankind.



CREDITS SYSTEM

Education at the Institute is organized around semester-based credit system of study. The prominent feature of the credit system is a process of continuous evaluation of a student's performance and flexibility to allow a student to progress at an optimum pace suited to his/her ability, subject to fulfilling minimum requirement for continuation. A student's performance is measured by number of credits he/she has earned (i.e. completed satisfactorily). Based on the course credits and grades obtained by the student, Semester Grade Point Average (SGPA) or Cumulative Grade Point Average (CGPA) is calculated. A minimum number of earned credits and minimum grade point average should be acquired in order to qualify for the award of graduate degree. Details are given in the Academic Rules and Regulation available on the Institute website www.vnit.ac.in

Credit requirement

A student is required to earn minimum of 170 credits in eight semesters. These credits are to be earned from different category of courses. There are mainly two category of courses a) Programme core (PC), and b) Program Elective (PE). There are sub categories like, Basic Sciences (BS), Departmental Core (DC), Departmental Elective (DE), Humanities & Management (HM), Open Course (OC) and Audit Course (AU).

Credit requirement for B. Tech. Program

Program Core (PC)		Program Elective (PE)	
Category	Credit	Category	Credit
Basic Science (BS)	18	Departmental Electives	33-48
Engineering Science (ES)	20	Humanities & Management	0-6
Humanities (HU)	05	Open Course	0-6
Departmental Core (DC)	79-82		
	122-125		48-45
Total requirement (PC +PE) = 170 credits			

**Courses to Register in First Year B.Tech.***(Sections R, S, T, U, L)*

I Semester				
Code	Course	Type	L-T-P	Credits
AML151	Engineering Mechanics	ES	3-1-0	4
AMP151	Engineering Mechanics Laboratory	ES	0-0-2	1
HUL101	Communication Skills	HM	2-0-2	3
MAL101	Mathematics I	BS	3-1-0	4
MEL101	Engineering Drawing	ES	3-0-0	3
MEP101	Engineering Drawing Practical	ES	0-0-2	1
PHL101	Physics	BS	3-1-0	4
PHP101	Physics Laboratory	BS	0-0-2	1
SAP101	Health Information and Sports Part I	AU	0-0-2	0
			Total Credits	21

II Semester				
Code	Course	Type	L-T-P	Credits
CHL101	Chemistry	BS	3-1-0	4
CHP101	Chemistry Laboratory	BS	0-0-2	1
CSL101	Computer Programming	ES	3-0-2	4
EEL101	Electrical Engineering	ES	3-1-0	4
EEP101	Electrical Engineering Laboratory	ES	0-0-2	1
HUL102	Social Science	HM	2-0-0	2
MAL102	Mathematics II	BS	3-1-0	4
MEP102	Workshop	ES	0-0-4	2
SAP102	Health Information and Sports Part II	AU	0-0-2	0
			Total Credits	22

L-T-P =3-1-0 Means, Three Theory Hrs +One Tutorial hrs + Zero Labs or Practical Hrs per Week.

L-T-P =0-0-2 Means, Two Hrs of Lab or Practical per Week



Courses to Register in First Year B.Tech.
(Sections W, X, Y, Z, N)

I Semester				
Code	Course	Type	L-T-P	Credits
CHL101	Chemistry	BS	3-1-0	4
CHP101	Chemistry Laboratory	BS	0-0-2	1
CSL101	Computer Programming	ES	3-0-2	4
EEL101	Electrical Engineering	ES	3-1-0	4
EEL101	Electrical Engineering Laboratory	ES	0-0-2	1
HUL102	Social Science	HM	2-0-0	2
MAL101	Mathematics I	BS	3-1-0	4
MEP102	Workshop	ES	0-0-4	2
SAP102	Health Information and Sports Part I	AU	0-0-2	0
			Total Credits	22

II Semester				
Code	Course	Type	L-T-P	Credits
AML151	Engineering Mechanics	ES	3-1-0	4
AMP151	Engineering Mechanics Laboratory	ES	0-0-2	1
HUL101	Communication Skills	HM	2-0-2	3
MAL102	Mathematics II	BS	3-1-0	4
MEL101	Engineering Drawing	ES	3-0-0	3
MEP101	Engineering Drawing Practical	ES	0-0-2	1
PHL101	Physics	BS	3-1-0	4
PHP101	Physics Laboratory	BS	0-0-2	1
SAP101	Health Information and Sports Part II	AU	0-0-2	0
			Total Credits	21

L-T-P = 3-1-0 Means, Three Theory Hrs + One Tutorial hrs + Zero Labs or Practical Hrs per Week.
L-T-P = 0-0-2 Means, Two Hrs of Lab or Practical per Week



DETAILS OF COURSE CONTENTS

AML151 Engineering Mechanics,

[3-1-0, **Credit: 4]**

Pre-requisites: NIL

Type of Course: ES

Semester: I , II Sem B Tech

Assessment: Sess-I 15% + Sess-II 15% + TA 10%,+ End Sem 60%

Course Objective:

The objective of the course is to expose the students to the basic concepts of mechanics such as force, equilibrium, moment etc. and to solve simple structures like beam, truss and frame. To introduce mechanical properties of materials, concepts of stress and strain etc.

Course Outcomes:

- i. Students will be able to understand and analyse basic theory and principles of forces and their relationship to engineering applications.
- ii. Students will be able to determine centroid and second moment of area for various sections.
- iii. Students will be able to draw internal forces for beams with various boundary conditions under given set of loading.
- iv. Students will be able to understand the concepts of stresses and strains and their importance for engineering analysis and design.

Course Content:

Force systems: Vector representation of force system, Moment of a force about a point and about an axis; couple moment; reduction of a force system to a force a couple Wrench

Equilibrium: Free Body Diagram, Reactions at supports, Equilibrium of Planar (including friction) and Spatial force system, Analysis of statically determinate systems (Beam, Trusses etc.)

Centroid and Moment of inertia: First moment of area, Centroid of area, Moment of inertia, Polar moment of inertia, Parallel axis theorem, Radius of gyration, Section modulus.

Internal forces in member: Determination of variation of Axial force (Axial Force Diagram), Shear force (Shear Force Diagram), Bending moment (Bending Moment Diagram) and twisting moment (Torque diagram)

Concept of stress and strain: Normal and shear stress and strain, State of stress at a point, Stress strain curve, Hook's law, Modulus of elasticity, Poisson's ratio, Modulus of rigidity, Bulk modulus.

Determination of stress: Stress across a rectangular, T & I section, and circular section due to bending moment, Stress across a rectangular, T & I section, and circular section due to shear force. Stress across a circular section due to torsion.

Reference Books:

1. R. C. Hibbler, Engineering Mechanics, Pearson Education, Asia Pvt Ltd.
2. F. P. Beer and E.R. Johnston, Vector Mechanics for Engineers: Statics and Dynamics, Tata McGraw-Hill



1. Irving H. Shames, Engineering Mechanics: Static and Dynamics, Pearson Education, Asia Pvt Ltd.
2. J. L. Meriam and L.G. Kraige, Engineering Mechanics, John Wiley and Sons.
3. Stephen Timoshenko, Strength of Materials, Part-1, CBS Publishers and Distributors, New Delhi.
4. F. L. Singer and Andrew Pytel, Strength of Material, Harper and Row Publishers, New York.
5. E. P. Popov, Mechanics of deformable bodies, Prentice-Hall
6. F. P. Beer and E. R. Johnston, Mechanics of materials, McGraw-Hill International

AMP151 Engineering Mechanics Laboratory, [0-0-2, Credit: 1]
Pre-requisites: NIL **Type of Course:** ES **Semester:** I , II Sem B Tech
Assessment: Mid-term Eval 40% + End Term Eval 60%

Course Objective:

The objective of the course is to expose the students to simple practical experiments based on fundamental concept of mechanics

Course Outcome:

- i. The students will be able to see the experimental verification of certain laws of mechanics.
- ii. The students will be able to compare theoretical results with the experimental one.

Course Content:

1. Introduction to Engineering Mechanics
2. Proving the Law of Polygon of Forces
3. Verification of Lami's Theorem
4. Analysis of Shear Leg Structure
5. Determination of Reactions of a Simply Supported Beam
6. Determination of Coefficient of Static Friction
7. Determination of C.G. of Planar Figures
8. Tension Test on Metal Specimen
9. Bending Test on Wooden Beam
10. Torsion Test on Metal Specimen

Reference Books:

1. R. C. Hibbler, Engineering Mechanics, Pearson Education, Asia Pvt Ltd.
2. F. P. Beer and E.R. Johnston, Vector Mechanics for Engineers: Statics and Dynamics, Tata McGraw-Hill
3. Irving H. Shames, Engineering Mechanics: Static and Dynamics, Pearson Education, Asia Pvt Ltd.
4. J. L. Meriam and L.G. Kraige, Engineering Mechanics, John Wiley and Sons.
5. Stephen Timoshenko, Strength of Materials, Part-1, CBS Publishers and Distributors, New Delhi.
6. F. L. Singer and Andrew Pytel, Strength of Material, Harper and Row Publishers, New York.
7. E. P. Popov, Mechanics of deformable bodies, Prentice-Hall
8. F. P. Beer and E.R. Johnston, Mechanics of materials, McGraw-Hill International



CHL101 Chemistry,

[3-1-0, **Credit: 4]**

Pre-requisites: NIL

Type of Course: BS

Semester: I , II Sem B. Tech.

Assessment: Sess-I 15% + Sess-II 15% + TA 10%,+ End Sem 60%

Course Objective:

Course objective is to present sound knowledge of chemistry fundamentals, enriching student to understand the role of Applied Chemistry in the field of science and engineering. To inculcate habit of scientific reasoning to do the task rationally.

Course Outcomes:

- i. Understanding the basic theories and principles of applied chemistry
- ii. Exposure to chemical aspects of various kind of engineering materials
- iii. Ability to apply the chemical principles to solve the various engineering issues

Course contents:

Chemical kinetics and catalysis: Introduction to rate equation and reaction order, reaction mechanism, relation between rate equation and reaction mechanism, First order & Second order. Dependence of temperature on reaction rates. Arrhenius theory, collision theory, Transition state theory, Physical adsorption, chemisorption, Freundlich's expression, Langmuir adsorption isotherm, Heterogeneous catalysis, examples of heterogeneously catalysed reactions.

Features of Coordination Chemistry & Organic Reaction Mechanism: Coordination chemistry, coordination number, chelate effect, coordination complexes and their applications. Electrophilic substitution reactions in aromatic systems. Some Name reactions viz. Hoffman's rearrangement, Beckman's reaction, Riemer-Tiemann reaction, Skraup synthesis, etc.

Thermodynamics and electrochemical Phenomenon: Heat, work and energy, reversible and irreversible processes, work done in an isothermal reversible expansion of ideal gas. Enthalpy. Entropy. Electrochemical and galvanic series, polarization, decomposition potential, over voltage. Theories of corrosion. Differential aeration theory. Factors influencing corrosion. Types of corrosion Control of corrosion: Design and material selection, anodic and cathodic protection, protective coatings, corrosion inhibitors. Fuel Cells.

Analytical aspects of water: Sources, conservation of water, impurities in water and their effects. WHO guideline and BIS guideline for drinking water. Chemistry involved in sedimentation, coagulation and sterilization. Softening of water, lime-soda, ion-exchange process and numerical problem. Boiler troubles, causes and effects, methods of prevention.

Engineering Materials: Glass, ceramics, refractory, composites, magnetic materials, Polymers & structure property relationship. Thermoplastic & thermosetting plastics. Preparation, properties & applications of some commodity and engineering polymers. Conducting polymers.

Interaction of radiation with matter: Molecular spectroscopy, vibrational, rotational, absorption, emission and light scattering phenomenon.

Reference books:

1. Dara, S.S. and S.S. Umare A Text Book of Engineering Chemistry (Twelfth edition); S. Chand, 2014.



2. Shashi Chawla; A Text Book of Engineering Chemistry (Third edition); Dhanpat Rai & Co., 2006.
3. Kuriacose, J.C., Rajaram, J.; Chemistry in Engineering and Technology (Vol. 1&2); McGraw Hill, 1985.
4. Barrow, M. Gordon; Physical Chemistry (Fifth edition); McGraw-Hill, 1992.
5. March, Jerry.; Advance Organic Chemistry Reaction Mechanism and Structure (Seventh edition); John Wiley & Sons New York, 2013.
6. W. Kemp; Organic spectroscopy (III Edition) PALGRAVE, 2002.
7. Puri B.R., Sharma L.R., Pathania M.S; Principles of Physical Chemistry; Vishal Publishing Co. (42nd Edition)

CHL101 Chemistry Laboratory, [0-0-2, **Credit: 1]**

Pre-requisites: NIL **Type of Course:** BS **Semester:** I , II Sem B. Tech.

Assessment: Mid-term Eval 40% + End Term Eval 60%

Course Objective:

Course objective is to develop skills and capabilities of students in solving problem using knowledge of chemistry.

Course Outcomes:

- i. Understanding the significance and techniques used for water analysis
- ii. Learning safety aspects of chemical laboratory
- iii. Developing skills for chemical analysis and exposure to different environments

Course content:

1. Water and waste water analysis: Determination of
 - i. Hardness and alkalinity,
 - ii. Dissolved oxygen and free chlorine ,
 - iii. Chlorides, fluorides and COD,
 - iv. Trace metal determination in water using Ion-selective electrodes,
a) Arsenic, b) Lead, c) Mercury.
2. Determination of capacity of Ion exchange resins.
3. Analysis of ores and alloys:
 - i. Determination of Copper in brass,
 - ii. Calcium in limestone and dolomite.
4. Demonstration Experiments on Instrumental methods of analysis:
 - i. pH-Metric titration,
 - ii. Colorimetric determination,
 - iii. Turbidity by Nephelometer
5. Chemical Kinetics / Adsorption:
 - i. Rate constant,
 - ii. To study the adsorption of acetic acid on activated charcoal.

Reference books:

1. Dara, S.S.; A text book on Experiments and Calculations in Engineering Chemistry (ninth edition); S. Chand, 2003.



1. Rattan, S.; Experiments in Applied Chemistry (second edition); S.K. Kataria & Sons, 2003.
2. Rani, S.; Laboratory Manual on Engineering Chemistry; Dhanpat Rai, 1998.
3. Vogel's Text book of Quantitative Inorganic Analysis (fifth edition); Pearson, 2000.

CSL101 Computer Programming, [3-0-2, **Credit: 4]**
Pre-requisites: NIL **Type of Course:** ES **Semester:** I , II Sem B. Tech.
Assessment: Sess-I 15% + Sess-II 15% + Lab 20%,+ End Sem 50%

Course Objective:

The objective of the course is to introduce basics of programming and develop logical thinking of students. To help students understand how to model real world problems as computational problem and develop practical programming skills of students.

Course Outcomes:

- i. Understand basics of a computer program and develop logical steps to solve a computational problem using computers.
- ii. Understand different programming constructs and their syntax in C language and use them to implement a C program.
- iii. Understand and implement more advanced concepts of C language like structures, pointers etc. along with their programming constructs.

Course contents:

Introduction: Fundamentals of Computer and programming, Program development and execution, basics of algorithm and flow charts [CO1]

Basic C Constructs: Structure of C program, identifiers and keywords, variables, data types, Input/Output, Operators arithmetic, relational, logical, conditional etc., Expressions precedence and associativity, Type conversion, Decision making constructs including Switch case, Repetition/Loops - while/for/do-while [CO2]

Basic Programming algorithms: Programs to illustrate basic language constructs in C like Factorial, Sine/cosine and other mathematical series. Fibonacci series, calculating, square-root of a number, calculating GCD of 2 integers (Euclid's method and otherwise), Calculating LCM of 2 integers and similar such programs. [CO2]

More C constructs: Nested loops and examples like printing patterns, Functions Declaration, Definition, function calls. Formal and actual parameters. Inter function communication by parameter passing, scope and lifetime of variables, storage classes, macros, Recursive functions.

Arrays and applications : Introduction to one dimensional and 2-D array with examples. Sorting methods: Selection sort, Bubble sort, Insertion sort, Linear and binary search, partitioning an array, merging of 2 sorted arrays. Use of 2-D array to represent a matrix and matrix operations. Strings and designing your own string related functions as well as using library functions (strlen, strcpy, strcat, strcmp, atoi, itoa, reverse, strstr, etc). [CO2]

Structures: Basic concept and syntax tagged and typedef format, Defining and accessing structure members, array of structures, nested structures and application examples. [CO3]



File Handling : Basic Concept and Syntax-open,close, read, write operations, programs- on text data and numeric data (CO2)

Pointers: Introduction (declaration and initialization), pointers and arrays, pointer arithmetic, concept of dynamic memory allocation, use of pointers to represent variable-sized 1-D and 2-D arrays, pointers to structures. [CO3]

Reference books:

1. Kerninghan; Ritchie, "C Programming Language", PHI
2. Balguruswamy, "Programming in ANSI C" Tata Mcgraw Hill Publishing
3. Dromey R.G., "How to Solve it by Computer", PHI
4. Behrouz A. Forouzan, "Computer Science: A Structured Programming Approach Using C", Cengage Learning
5. Kakde and Deshpande, "C and data Structure", Charles River Media Publisher

EEL101 Electrical Engineering, [3-1-0, **Credit: 4]**

Pre-requisites: NIL **Type of Course:** ES **Semester:** I , II Sem B. Tech.

Assessment: Sess-I 15% + Sess-II 15% + TA 10%,+ End Sem 60%

Course Objective:

The objective of the course is

- i. To learn basic ideas and principles of Electrical Engineering.
- ii. Understanding details of electrical power systems, transformers, generators and motors.

Course Outcomes:

- i. Understand basics of R , L , C circuit elements and voltage /current sources.
- ii. Appreciate and analyze DC, AC and magnetic circuits using KVL and KCL.
- iii. Understand working principle of electrical measuring instruments and transformers.
- iv. Comprehend the working of DC machines and induction motors.

Course Content:

Electrical Circuits:- Circuit Elements Resistance, Inductance & Capacitance, Kirchhoff's Laws, Voltage Source (Definition, Characteristics of Practical Source, and Equivalent Current Source), and Star-Delta Transformation.

Magnetic Circuits:- Flux, MMF, Reluctance, Analogy with Electric Circuits. Simple Calculations for Composite Magnetic Circuits.

AC Circuits :-Periodic Function, Average & R.M.S., Values, Steady State Behavior With Sinusoidal Excitation, Phasor Representation, Reactance & Impedance, Series & Parallel Circuit, Power Factor, Principle of Generation of Single Phase & Three Phase Voltages, Power in Balanced Three Phase AC System.

Electrical Measurements:- Definition, Indicating, Integrating & Recording Instruments, Deflecting Controlling & Damping Mechanisms, Ammeter & Voltmeters, P.M.M.C. Type & Moving Iron Type, Electrodynamometer Type Watt meter, Induction Type Single Phase Energy Meter

Transformers:- Introduction, Basic Principles, Construction, Phasor Diagram for Transformer under No Load Condition Transformer on Load, Balance of MMF on Sides, Phasor Diagram, Equivalent Circuit, Voltage Regulation and Efficiency



Power Systems: - Elementary Idea about Power Generation, Transmission and Distribution

DC Machines: - DC Shunt and Series Motor Construction, Principle of working, Characteristics, Speed Control and Applications

Induction Motors:-Construction, Principle of Working of Single Phase and 3-Phase Motors. Torque Slip Characteristics, Basic issues involved in electrical hazard and electrical safety.

Reference Books:

1. D. C. Kulshretha, "Basic Electrical Engineering", Tata Mcgraw Hill, 2012.
2. S.K. Bhattacharya , "Basic Electrical and Electronics Engineering", Pearson Education, 2012
3. O.I. Elgerd, "Basic Electric Power Engineering", Addison Wesley Longman
4. Kothari D.P. and Nagrath I.J., "Theory And Problems of Basic Electrical Engineering," Prentice Hall
5. Edward Hughes, "Electrical Technology", Pearson Education , 2008
6. Basic Electrical Engineering A Web course of NPTEL by Day, Bhattacharya & Roy, Available:- www.nptel.ac.in
7. Fitzgerald, Higginbotham and Gabel, "Basic Electrical Engineering", McGraw Hill

EEP101 Electrical Engineering Laboratory, [0-0-2, **Credit: 1**]
Pre-requisites: NIL **Type of Course:** ES **Semester:** I , II Sem B. Tech.
Assessment:Phase I-(30-35)% + Phase II-(30-40)% + End Sem (25-40)%

Course Objective:

The objective of the course is

- i. To verify experimentally the basic principles of electric and magnetic circuits.
- ii. To verify and validate experimentally the working principles of Three Phase systems, Transformers and Motors.

Course Outcomes:

Students are able to

- i. Handle basic instruments and elements R, L and C.
- ii. Verify basic Laws of Single phase and three phase AC circuits and magnetic circuits experimentally.
- iii. Demonstrate experimentally basics of transformer.
- iv. Show the basic principles of DC Machines and induction motors experimentally.

List of Experiments:

1. Study and verification of Kirchhoff's Laws applied to the direct current circuit.
2. Determination of B/H curve of a magnetic material
3. Study of AC series circuits.
4. Study of AC Parallel circuits.
5. To study balanced three phase circuit.



6. Determine Voltage regulation and efficiency of a single phase transformer by direct loading.
7. Speed control of a DC motor by varying :-
 - a. Field current with armature voltage kept constant
 - b. Armature voltage with field current kept constant.
- 8 Reversal of direction of rotation of a three phase induction motor

Reference Books:

1. D. P. Kothari, B. S. Umre, "Laboratory manual for Electrical Machines Second Edition" IK International Publishing House Pvt. Ltd., New Delhi.

HUL101 Communication Skill,

[2-0-2, Credit: 3]

Pre-requisites: NIL **Type of Course:** HM **Semester:** I, II Sem B. Tech.

Assessment: Sess-I 15% + Sess-II 15% + TA 10%,+ End Sem 60%

Course Objective:

The objective of the course is

- i. To impart to the students the skills that they need in their academic, and later in their professional pursuit
- ii. To train the students to adopt an innovative approach to English language learning

Course Outcomes:

- i. The syllabus enhances the language acquisition skill of the students (LSRW Skills)
- ii. It helps the students to acquire oral proficiency in English (Interpersonal Communication)
- iii. The course enables the students to have better presentation skills (GD, Interviews, PPT Presentations, Public Speaking)
- iv. It helps students sharpen their writing skills (CV, Resume, Job Applications, Reports, etc.)

Course Content:

Unit 1: Energy- Oil, Nuclear Preparation, Alternative Sources

Unit 2: Computers- Introducing Computers, New Frontiers, Computers in India

Unit 3: Technology- Appropriate Technology, Printing, Evaluating Technology

Unit 4: Environment- Pollution, Ecology, Our Living Environment

Unit 5: Industry- Personnel and Production, Safety And Training, Selling Products

Reference Books:

1. Department of Humanities and Social Sciences, Anna University., A Textbook of English for Engineers and Technologist, Orient Longman
2. Quirk R, and Greenbaum S., A University Grammar of English
3. Krishnaswamy N., Modern English: A Book Of Grammar- Usage And Composition, Macmillan India Ltd



HUL102 Social Science,

[2-0-0, **Credit: 2]**

Pre-requisites: NIL

Type of Course: HM

Semester: I , II Sem B. Tech.

Assessment: Sess-I 15% + Sess-II 15% + TA 10%,+ End Sem 60%

Course Objective:

The objective of the course is to make the students familiar with the basic concepts used to understand the social, cultural and political activities with context to Indian society.

Course Outcomes:

- i. It will help to understand the basic concepts in social science in the era of globalization
- ii. It will create awareness about social problems and issues in the nation.
- iii. It will help to gaining the knowledge of society and nation development with science and technology.
- iv. Students will know the constitutional set-up, beaurocracy and current situation of India.

Course Content:

Unit-I Introduction

1. Meaning, scope and general utility of social sciences.
2. Society: types, characteristics and problems.

Unit -II Fundamental concept in social science

1. Culture: types, characteristics, merit, demerit and some related terms.
2. Economics and social sustainable development.
3. Human resource management, public health, law enforcement and good governance.
4. Social control and social change.

Unit -III Industrialization and Society

1. Field, involvement and development of science and technology.
2. Human values and professional ethics.
3. General issues on environment ecology, bi-diversity and climate change.
4. Motivation, selection and training of employees.

Unit -IV the study of Political Orientation

1. Indian constitution and federal system.
2. Fundamental rights and directive principles.
3. Right to information (RTI).
4. Beaurocracy in India.

Unit -V Social Problems in India

1. Over Population.
2. Poverty.
3. Slum.
4. Family disorganization (divorce)
5. Corruption



Reference Books:

1. Social and Ethical Sciences for Engineers, Dr.G.N.Nimbarte, Mangesh Publication Nagpur
2. Social Problems in India, Ram Ahuja, Rawat Publication Jaipur
3. Ethical Science, Dr.G.N.Nimbarte, Dattson Publication, Nagpur
4. Introduction to Sociology, Vidhyabhushan and Sachdeva, KitabMahal, New Delhi

MAL101 Mathematics-I,

[3-1-0, Credit: 4]

Pre-requisites: NIL

Type of Course: BS

Semester: I , II Sem B. Tech.

Assessment: Sess-I 15% + Sess-II 15% + TA 10%,+ End Sem 60%

Course Objective:

The objective of this course is to expose student to understand the basic importance of Differential calculus, Integral calculus, Infinite series and Matrix theory in science and engineering.

Course Outcomes:

- i. Students will be able to acquire basic understanding of single variable calculus and Matrix theory.
- ii. Students will be able to study higher level courses in Engineering Mathematics, which will be helpful for solving real life problems.

Course Content:

Differential Calculus: Functions of single variable: Review of limit, continuity and differentiability. Mean value theorems: Rolle's theorem, Lagrange's theorem, Cauchy's theorem, Taylor's theorem with Lagrange's form of remainder, curve tracing.

Integral Calculus: Fundamental theorem of Integral calculus, mean value theorems, evaluation of definite integrals, applications in area, length, volumes and surface of solids of revolutions, Improper integrals: Beta and Gamma functions, differentiation under integral sign.

Infinite series: Sequences, Infinite series of real and complex numbers, Cauchy criterion, tests of convergence, absolute and conditional convergence, improper integrals, improper integrals depending on a parameter, uniform convergence, power series, radius of convergence.

Matrices: Rank of matrix, consistency of a system of equations, linear dependence and independence, linear and orthogonal transformations, Eigen values and eigen vectors, Cayley Hamilton theorem, reduction to diagonal form, Hermitian and skew Hermitian matrices, Quadratic forms.

Reference Books:

1. Kreyszig, E. ; Advanced Engineering Mathematics (Eighth Edition); John Wiley & Sons.
2. Jain, R.K. and Iyengar, S.R.K.; Advanced Engineering Mathematics; Narosa Publishers .
3. Thomas, G.B. and Finney, R.L.; Calculus and Analytic Geometry (Ninth Edition); Addison Wesley Longman, Inc.
4. Michael D. Greenberg: Advanced Engineering Mathematics, Pearson Education Pvt. Ltd.
5. Piskunov, N. : Differential and Integral calculus, Vol. 1, Vol. 2, MIR Publishers, Moscow - CBS Publishers and Distributors (India).



MAL102 Mathematics-II,

[3-1-0, **Credit: 4]**

Pre-requisites: NIL **Type of Course:** BS **Semester:** I , II Sem B. Tech.

Assessment: Sess-I 15% + Sess-II 15% + TA 10%,+ End Sem 60%

Course Objective:

The objective of this subject is to expose student to understand the basic importance of multi variable calculus (Differential calculus & Integral calculus), Vector calculus and ordinary differential equations in engineering.

Course Outcomes:

- i. Students will be able to acquire basic understanding of single variable calculus and Matrix theory.
- ii. Students will be able to study higher level courses in Engineering Mathematics, which will be helpful for solving real life problems.

Course Content:

Calculus of Functions of Several Variables: Limit, continuity and differentiability of functions of several variables, partial derivatives and their geometrical interpretation, Tangent plane and normal line. Euler's theorem on homogeneous functions, Total differentiation, chain rules, Jacobian, Taylor's formula, maxima and minima, Lagrange's method of undetermined multipliers.

Multiple Integrals: Double and triple integrals, change of order of integration, change of variables, application to area, volumes, Mass, Centre of gravity.

Vector Calculus: Scalar and vector fields, gradient of scalar point function, directional derivatives, divergence and curl of vector point function, solenoidal and irrotational motion.

Vector integration: line, surface and volume integrals, Green's theorem, Stoke's theorem and Gauss divergence theorem (without proof).

Ordinary Differential Equations: First order differential equations: Exact equation, Integrating factors, Reducible to exact differential equations, Linear and Bernoulli's form, orthogonal trajectories, Existence and Uniqueness of solutions. Picard's theorem, Picard's iteration method of solution (Statements only). Solutions of second and higher order linear equation with constant coefficients, Linear independence and dependence, Method of variation of parameters, Solution of Cauchy's equation, simultaneous linear equations.

Reference Books:

1. Kreyszig, E. ; Advanced Engineering Mathematics (Eighth Edition); John Wiley & Sons.
2. Jain, R.K. and Iyengar, S.R.K.; Advanced Engineering Mathematics; Naros Publishers.
3. Thomas, G.B. and Finney, R.L.; Calculus and Analytic Geometry (Ninth Edition); Addison Wesley Longman, Inc.
4. Piskunov, N. : Differential and Integral calculus, Vol.1, Vol.2 MIR Publishers, Moscow - CBS Publishers and Distributors (India).
5. Michael D. Greenberg: Advanced Engineering Mathematics, Pearson Education Pvt. Ltd.



MEL103 Engineering Drawing,

[3-0-0, **Credit: 3]**

Pre-requisites: NIL

Type of Course: ES

Semester: I, II Sem B. Tech.

Assessment: Sess-I 15% + Sess-II 15% + TA 10%,+ End Sem 60%

Course Objective:

The objectives of the course are

- i. To understand the Principles and methods of projections as per National Standards.
- ii. To develop the visualization skills for interpretation of use of various objects like lines, planes and solids.
- iii. To understand the section of solids and development of lateral surfaces and intersection of solids.
- iv. To acquire skills to interpret and convert multi-views drawing into single view and vice versa.

Course Outcomes:

- i. Students will be able to understand the conventions, standards for engineering drawing.
- ii. Students will be able to apply the knowledge of Projections, Methods to prepare the drawings for lines, planes and solids.
- iii. Students will be able to interpret and draw section of solids, development of lateral surfaces and intersection of solids.
- iv. Students will be able to visualize and convert 2D to 3D drawing and vice versa.

Course Content:

Introduction to BIS SP-46-2003, Use of various drawing instruments, Concept of scales, Representative factor and dimensioning, Conversation of Pictorial views to orthographic/ profile views, orthographic projections of points, lines, plane on principle planes/Profile plane/Auxiliary planes.

Projection of right regular solids inclined to both the planes. Section and development of surfaces of solids. (Preferably in normal position/ Inclined to one plane). Intersection of combination of regular solid (Preferably in normal position/ Inclined to one plane). Drawing isometric views and projection from orthographic projection/ orthographic views.

Reference Books:

1. Bhatt N.D and Panchal VM, Elementary Engineering Drawing, (Plane and Solid Geometry), Charotar Publishing House, 53rd Edition.
2. Jolhe Dhananjay, Engineering Drawing with An introduction to Autocad, Tata McGraw Hill Publishing Company Limited, 5th Edition 2017
3. BIS-SP-46-2003, Handbook BIS SP-46 -2003, BIS

MEL103 Engineering Drawing Practical,

[0-0-2, **Credit: 1]**

Pre-requisites: NIL

Type of Course: ES

Semester: I, II Sem B. Tech.

Assessment: Mid-term Eval 40% + End Term Eval 60%

Course Objective:

The objectives of the course are

- i. To understand the Principles and methods of projections as per National Standards.
- ii. To develop the visualization skills for interpretation of use of various objects like lines, planes and solids.



- iii. To understand the section of solids and development of lateral surfaces and intersection of solids.
- iv. To acquire skills to interpret and convert multi-views drawing into single view and vice versa.

Course Outcomes:

- i. Students will be able to understand the conventions, standards for engineering drawing.
- ii. Students will be able to apply the knowledge of Projections, Methods to prepare the drawings for lines, planes and solids.
- iii. Students will be able to interpret and draw section of solids, development of lateral surfaces and intersection of solids.
- iv. Students will be able to visualize and convert 2D to 3D drawing and vice versa.

Course Content:

Introduction to BIS SP-46-2003 Explanation of various drawing instruments, symbols, RF, Dimensioning, etc. Practice of scales, Representative Factor and dimensioning on some practical exemplary figure. Conversion of pictorial views to orthographic / profile views. Projection of points and lines Projections of planes. Projections of lines and planes using Auxiliary planes REVIEW I of sheets.

Projections of solids. Section and development of solids. Intersection of solids. Isometric views REVIEW II of sheets

Reference Books:

1. Bhatt N.D and Panchal VM, Elementary Engineering Drawing, (Plane and Solid Geometry), Charotar Publishing House, 53rd Edition.
2. Jolhe Dhananjay, Engineering Drawing with An introduction to Autocad, Tata McGraw Hill Publishing Company Limited, 5th Edition 2017
3. BIS-SP-46-2003, Handbook BIS SP-46 -2003, BIS

PHL101 Physics,

[3-1-0, **Credit: 4]**

Pre-requisites: NIL

Type of Course: BS

Semester: I , II Sem B. Tech.

Assessment: Mid-term Eval 40% + End Term Eval 60%

Course Objective:

- i. Provides a strong foundation in physics and mathematics in preparation for technical or scientific careers.
- ii. The skills to be able to function as productive, qualified engineering professionals in areas where traditional science and engineering disciplines overlap.
- iii. An awareness of the importance of continued professional development.

Course Outcomes:

- i. An ability to apply knowledge of mathematics, science and engineering.
- ii. An ability to design a system, a component, a process or a measurement technique to meet specific criteria.
- iii. A general educational experience sufficient to support an understanding of the impact of engineering and science solutions in a global/societal context.
- iv. An ability to function on multidisciplinary teams



Course Content:

Black Body Radiations, Photoelectric effect, Compton effect, Concept of matter waves, Davission and Germer's experiment, Heisenberg's Uncertainty principle, Schrodinger's Wave equation and its application. Quantization of energy.

Crystal Structure : Unit cell and its characteristics in SC , BCC, FCC crystal structure, Miller indices, Bragg's Law, interplaner spacing.

Formation of energy bands in solid, Fermi level in an intrinsic and extrinsic semiconductor, Hall effect, p-n junction diode, transistors.

Motion of charged particles in electric and magnetic field. Electrostatic and magnetostatic focussing, CRO, Cyclotron.

Interference, diffraction and their applications.

Reference Books:

1. Resnick, Walker and Halliday, Fundamental of Physics, John Willey and Sons. Inc, 6th Edition, 2005.
2. B. G. Streetman, Solid State Electronics, Prentice Hall India (2nd Edition) 1986
3. M.N. Avadhanulu and P.G. Kshirsagar, A text Book of Engineering Physics, (7th Edition) 2004.
4. Dekkar A.J.; Electrical Engineering Materials; Prentice Hall og India Publication, 1992
5. Kenneth Krane; Modern Physics; (2 nd Edition); John Wiley Eastern, 1998
6. S. O. Pillai, Solid State Physics, New Age International Publishers, 3rd edition, 1999

PHP101 Physics Laboratory,

[0-0-2, Credit: 1]

Pre-requisites: NIL

Type of Course: BS

Semester: I , II Sem B. Tech.

Assessment: Sess-I 15% + Sess-II 15% + TA 10%,+ End Sem 60%

Course Objective:

- i. The Objective of this course is to make the students gain practical knowledge to co-relate with the theoretical studies.
- ii. To achieve perfectness in experimental skills and the study of practical applications will bring more confidence and ability to develop and fabricate engineering and technical equipments.
- iii. Design of circuits using new technology and latest components and to develop practical applications of engineering materials and use of principle in the right way to implement the modern technology.

Course Content:

List of The Experiments :

1. To study the characteristics of Photocell and to determine the work function of the cathode material.
2. To calibrate an electromagnet and to study the dependence of Hall voltage on magnetic field and current through the sample.
3. To study the I/P, O/P and transfer characteristics and to determine ' α ' of transistor in common base mode.



4. To study the forward and reverse characteristics of semiconductor diode.
5. To determine the bandgap in a semiconductor using reverse biased p-n junction diode.
6. To determine e/m for an electron by Thomson's method.
7. To calibrate an audio frequency oscillator and to determine the unknown frequency and phase of RC network by using single trace CRO.
8. To determine the radius of curvature of a plano-convex lens using Newton's Rings.
9. To determine the wavelength of sodium vapour lamp by plane transmission grating.

MEP102 Workshop,

Pre-requisites: NIL

Type of Course: ES

[0-0-4, **Credit:** 2]
Semester: I, II Sem B. Tech.

Assessment: TA 100%

Course Objective:

The objectives of the course are

- i. To make the students aware with various skills involved in basic engineering processes for manufacturing and assembly.
- ii. To make students aware of various basic engineering processes like cutting, filing and joining and to have hands on experience for the same.

Course Outcomes:

At the end of the course students will be able to

- i. Acquire skills in basic engineering practice.
- ii. Identify the hand tools and instruments.
- iii. Gain measuring skills.
- iv. Obtain practical skills in the various trades.
- v. Enhance psycho motor skills and attitude

Course Content:

Fitting: Use and setting of fitting tools for chipping, cutting, filing, marking, center punching, drilling, tapping. Term work to include one job involving following operations: Filing to size, drilling and tapping.

Carpentry: Use and setting of hand tools like hacksaws, Jack planes, chisels and gauges for construction of various joints, wood turning and modern wood turning methods. Term work to include one carpentry job involving a joint and report on demonstration of a job involving wood turning.

Welding: Use and setting of tools and equipments for edge preparation for welding jobs and Arc welding for Jobs like, Lap welding of two plates, butt welding of plates.

Machining: At least one metal turning job is to be demonstrated.

CNC Machines: One job on CNC Lathe and CNC Milling machine to be demonstrated.

Foundry: At least one demonstration of mould making.

Reference Books:

1. Workshop Technology by W.A.J. Chapmen, Part I, II & III.



SAP101 Health Information and Sports- Part I

[0-0-2, Credit: 0]

Pre-requisites: NIL . **Type of Course:** AU . **Semester:** I Sem B.Tech.

Assessment: End Sem 100%

Course Objective:

- i. To provide information about physical, Physiological & Psychological aspects of sports & physical.
- ii. To create awareness among the students about their health status, by conducting various physical fitness tests and suggest them suitable remedial physical fitness programme.
- iii. To provide information of different therapeutic exercises.
- iv. To make students aware about the rules and regulation of different games & sports.
- v. To provide opportunity to mingle with each other through participating in different physical education & sports activities.

Course Outcomes:

- i. Enriched proper knowledge among the students about emerging issues such as health & fitness, wellness etc.
- ii. Students will become aware about the sense of discipline & dedication in general life, develop the spirit of team work through various physical education & sports activities.
- iii. Development of rational thinking and scientific temper among the students.

Course Content:

1. Introduction to psychological problem of a sports person
 - A. Brief discussion on the technical aspect of sports psychology
 - B. Relaxation
 - C. Hypnotherapy
 - D. Counseling
 - E. Autosuggestion
 - F. Visualization
 - G. Imagination
 - H. Leadership building
 - I. Mental rehearsal
 - J. Neuro psychological techniques for concentration, reaction time, eye hand coordination
 - K. Self motivational instruction coaches workout and observation
2. Warming up, Cooling Down & Full Body Stretching
3. Obesity & its Management: Daily caloric requirements and daily energy expenditure
4. Scientific principles of training
5. Health & Performance related physical fitness

Practical:

- a) The student must actively participate in games: Football, Basketball, Volleyball, Handball, Cricket, Kho-Kho, Kabaddi, Badminton, Table Tennis, Yoga etc.
- b) Physical Efficiency Test
- c) Intramural Sports Programme
- d) Minor Technosport projects



Reference Books:

1. Edlin, Golanty and Brown, Health and wellness (Joines and Bartlett (5th & 7th Edition) Publishers, London) 2002
2. Arnold G. Nelson, (2007), "Stretching Anatomy" Human Kinetics
3. Marcia K. Anderson & Susan J. Hall (1997), Fundamentals of Sports Injury Management" Lippincott Williams & Wilkins

SAP102 Health Information and Sports- Part II

[0-0-2, Credit: 0]

Pre-requisites: NIL **Type of Course:** AU

Semester: II Sem B. Tech.

Assessment: End Sem 100%

Course Objective:

- i. To make the learner able to know the conditions of stress and its management technique.
- ii. To deliver the knowledge of daily calorie requirement and obesity.
- iii. To provide information of different training principles for practicing different sports & games.
- iv. To motivate the students to innovate new technologies in the field of physical education & sports.

Course Outcomes:

- i. The learner will be able to manage his stress level.
- ii. The student will be able to design his diet chart as per his daily requirements.
- iii. Students will be able to create some new designs of sports facilities and equipments.

Course Content:

1. Adjustment, Frustration, Tension and conflict
 - A. Meaning & Definition of Adjustment & Frustration
 - B. Kinds & Causes of Frustration
2. Periodization: Preparatory period, Competition period and transitional period
3. Effects of exercise on various physiological systems
4. Therapeutic Exercise & Therapeutic Modalities
5. The Science of Stress & its yogic Management

Practical:

- a) The student must actively participate in games: Football, Basketball, Volleyball, Handball, Kabaddi, Badminton, Table Tennis, Chess, Yoga etc.
- b) Intramural Sports Programme
- c) Physical Efficiency Test

Reference Books:

1. Edlin, Golanty and Brown, Health and wellness (Joines and Bartlett (5th & 7th Edition) Publishers, London) 2002
2. Arnold G. Nelson, (2007), "Stretching Anatomy" Human Kinetics
3. Marcia K. Anderson & Susan J. Hall (1997), Fundamentals of Sports Injury Management" Lippincott Williams & Wilkins



GRADING SYSTEM

Continuous evaluation process, based on student's performance in uniformly placed I & II Sessional Examinations, Teachers Assessment (TA) and End-Semester Examination for each course. At the end of semester, grades shall be awarded by course coordinator or concerned faculty as a performance indicator. Details of these grades are as given below.

Grades	Grade Points	Description of performance
AA	10	Outstanding
AB	09	Excellent
BB	08	Very Good
BC	07	Good
CC	06	Average
CD	05	Below Average
DD	04	Marginal
FF	00	Very-poor/ Unsatisfactory / Absence in End-Sem Examination
W		Attendance Less than 75 % . Not Eligible for End-Sem Examination. Shall repeat the Course
SS		Satisfactory Completion of Audit Course
ZZ		Un-satisfactory / Audit Course continuation

Calculations of SGPA & CGPA

Semester Grade Point Average (SGPA) or Cumulative Grade Point Average (CGPA) is calculated as follows,

$$SGPA = \frac{\sum_{\text{semester}} (\text{Course credits} \times \text{Grade points}) \text{ for all courses except audit}}{\sum_{\text{semester}} (\text{Course credits}) \text{ for all courses except audit}}$$

$$CGPA = \frac{\sum_{\text{semester}} (\text{Course credits} \times \text{Grade points}) \text{ for all courses with pass grade except audit}}{\sum_{\text{semester}} (\text{Course credits}) \text{ for all courses except audit}}$$



ATTENDANCE

All students must attend every class and 100% attendance is expected from the students. However, in consideration of the constraints/ unavoidable circumstances, the attendance can be relaxed by course co-ordinator only to the extent of not more than 25%. Every student must attend minimum of 75% of the classes actually held for that course

A student with less than 75% attendance in a course during the semester will be awarded W grade. Such a student will not be eligible to appear for the end semester and re-examination of that course. Even if such a student happens to appear for these examinations, then, answer books of such students will not be evaluated. A student with W grade is not eligible to appear for Re-examination and summer term also.

Students will be informed about their attendance status after each sessional examination.

REGISTRATION & ENROLLMENT

Registration is a very important procedural part of the academic system. The registration procedure ensures that the student's name is on the roll list of each course that he/she wants to study. Web based registration facility is available but only on the intranet of VNIT, Nagpur. The choice of courses must be approved by his/her faculty adviser/ faculty Mentor.



VIT VELLORE UNIVERSITY
DEPARTMENT OF BIOTECHNOLOGY, NAGPUR
ACADEMIC CALENDAR (2019-2020)



2019	SUN	MON	TUE	WED	THU	FRI	SAT
JULY	7	8	9	10	11	12	13
	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
	28	29	30	31			
AUG	4	5	6	7	8	9	10
	11	12	13	14	15	16	17
	18	19	20	21	22	23	24
	25	26	27	28	29	30	31
SEPT	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
OCT	29	30	31	1	2	3	4
	6	7	8	9	10	11	12
	13	14	15	16	17	18	19
	20	21	22	23	24	25	26
NOV	27	28	29	30	31	1	2
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
DEC	24	25	26	27	28	29	30
	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
JAN 2020	22	23	24	25	26	27	28
	29	30	31	1	2	3	4
	5	6	7	8	9	10	11
	12	13	14	15	16	17	18
FEB	19	20	21	22	23	24	25
	26	27	28	29	30	31	

AUTUMN (ODD SEM)		SPRING (EVEN SEM)	
22 nd July 2019	02 Jan 2020	02 Jan 2020	02 Jan 2020
6 th Sept 2019	20 th Feb 2020	20 th Feb 2020	20 th Feb 2020
13 th Sept 2019	25 th Feb 2020	25 th Feb 2020	25 th Feb 2020
18 th Oct 2019	31 st Mar 2020	31 st Mar 2020	31 st Mar 2020
15 th Nov 2019	24 th April 2020	24 th April 2020	24 th April 2020
16 th -19 th Dec	18 th April 2020	18 th April 2020	18 th April 2020
4 th Dec 2019	6 th May 2020	6 th May 2020	6 th May 2020
29 th Nov-22 nd Jan	11 th May 2020	11 th May 2020	11 th May 2020
16 Dec-30 Dec	1st May to 20 th July	1st May to 20 th July	1st May to 20 th July
1 st to 31 st Dec	25 th May-30 th July	25 th May-30 th July	25 th May-30 th July
16 th -19 th Dec	1 st -31 st July	1 st -31 st July	1 st -31 st July
24 th Dec 2019	19 th to 22 nd May	19 th to 22 nd May	19 th to 22 nd May
1 st to 20 th Oct	20 th July 2020	20 th July 2020	20 th July 2020
28 th to 29 th Dec	6 th to 8 th March	6 th to 8 th March	6 th to 8 th March

AUTUMN (EVEN SEM)		SPRING (ODD SEM)	
22 nd July 2019	02 Jan 2020	02 Jan 2020	02 Jan 2020
6 th Sept 2019	20 th Feb 2020	20 th Feb 2020	20 th Feb 2020
13 th Sept 2019	25 th Feb 2020	25 th Feb 2020	25 th Feb 2020
18 th Oct 2019	31 st Mar 2020	31 st Mar 2020	31 st Mar 2020
15 th Nov 2019	24 th April 2020	24 th April 2020	24 th April 2020
16 th -19 th Dec	18 th April 2020	18 th April 2020	18 th April 2020
4 th Dec 2019	6 th May 2020	6 th May 2020	6 th May 2020
29 th Nov-22 nd Jan	11 th May 2020	11 th May 2020	11 th May 2020
16 Dec-30 Dec	1st May to 20 th July	1st May to 20 th July	1st May to 20 th July
1 st to 31 st Dec	25 th May-30 th July	25 th May-30 th July	25 th May-30 th July
16 th -19 th Dec	1 st -31 st July	1 st -31 st July	1 st -31 st July
24 th Dec 2019	19 th to 22 nd May	19 th to 22 nd May	19 th to 22 nd May
1 st to 20 th Oct	20 th July 2020	20 th July 2020	20 th July 2020
28 th to 29 th Dec	6 th to 8 th March	6 th to 8 th March	6 th to 8 th March

Departmental Academic Review for the year 2018-19 from 1st July to 31st August 2019
 Even Sem: 29th Feb, Fri, 14th Mar, Wed, 29th Mar, Fri, 18th April, Wed
 Odd Sem: 26th Jan, Republic Day, 06th April, Mahavir Jayanti, 21st Feb, Mahashivratri, 10th April, Good Friday, 10th Mar, Holi, 07th May, Buddha Purnima, 25th Mar, Good Friday, 24th May, Idul-Fitr

HOLIDAY
 12 Aug Id-ul-Zuhra (Bakeri) 27 Oct Diwali
 15 Aug Independence Day 28 Oct Gowardhan Puja
 02 Sep Ganesha Chaturthi 29 Oct Bhad Duj
 10 Sep Maharram 10 Nov Id E Milad
 02 Oct Mahatma Gandhi's Birthday
 08 Oct Vijaya Dashmi 25 Dec Christmas Day

EXAMINATION-TIME
 First Slot in the day: Higher Sem am 9:00-10:00 am, 10:30-11:30 am, 2:00-3:00 pm
 Second Slot in the day: Higher Sem am 9:00-10:00 am, 10:30-11:30 am, 2:00-3:00 pm
 Higher Sem am 4:00-5:00 pm, 2:00-3:00 pm

EXAMINATIONS
 Slot I: 28th Aug, 29th Aug, 30th Aug, 31st Aug, 1st Sept, 2nd Sept, 3rd Sept, 4th Sept, 5th Sept, 6th Sept, 7th Sept, 8th Sept, 9th Sept, 10th Sept, 11th Sept, 12th Sept, 13th Sept, 14th Sept, 15th Sept, 16th Sept, 17th Sept, 18th Sept, 19th Sept, 20th Sept, 21st Sept, 22nd Sept, 23rd Sept, 24th Sept, 25th Sept, 26th Sept, 27th Sept, 28th Sept, 29th Sept, 30th Sept, 31st Sept



VISVESVARAYA NATIONAL INSTITUTE OF TECHNOLOGY, NAGPUR – 440 010 (INDIA)

First Year B. Tech. (2019-20)

Time Table for First Semester (R, S, T, U & L Sections)

Physics Stream

Day	Section	1 8.00-8.55 am	2 9.00-9.55 am	3 10.00-10.55 am	4 11.00-11.55 am	5 12.00-12.55 pm	6 2.00-2.55 pm	7 3.00-3.55 pm	8 4.00-4.55 pm	9 5.00-5.55 pm
Monday	R	PH	EM	MA	CS	ED	EM_T1, PH_T3	EM_T2, PH_T4	SP	
	S	EM	MA	MA_T2, EM_T4	PH_P1, EM_P2, ED_P3, CS_P4	ED	MA_T1, EM_T3	PH_T1, MA_T3	EM_T3, MA_T4	
	T		PH_P1, EM_P2, ED_P3, CS_P4	EM	ED	PH_T2, EM_T4	MA_T1	MA_T2	PH_P1, EM_P2, ED_P3, CS_P4	
	U		PH	ED	MA	PH	PH_P1, EM_P2, ED_P3, CS_P4	EM_T4		
	L		PH	ED	MA_T1	MA_T2		EM_T3	EM_T4	
Tuesday	R	EM	PH	MA	PH	ED	EM_T3	EM_T4	PH_T1	PH_T2
	S	MA	EM	ED	PH	ED	MA_T3	MA_T4	SP	
	T	PH	CS_P1, PH_P2, EM_P3, ED_P4	EM	EM	MA	ED_P1, CS_P2, PH_P3, EM_P4	PH_T2		
	U		CS	ED	CS_P1, PH_P2, EM_P3, ED_P4	EM	PH_T1	PH_T2		
	L		PH	CS	MA	MA	PH_T1	PH_T2	EM_P1, ED_P2, CS_P3, PH_P4	
Wednesday	R		EM	MA			PH_P1, EM_P2, ED_P3, CS_P4	CS_P1, PH_P2, EM_P3, ED_P4	PH_T1	PH_T2
	S	ED	CS_P1, PH_P2, EM_P3, ED_P4	EM	PH	CS	MA_T1, PH_T3	EM_T1, MA_T2		
	T		PH	EM_T2, PH_T4	EM	MA	PH_T3, EM_T4	PH_T4, EM_T3	SP	
	U		ED	EM	ED_P1, CS_P2, PH_P3, EM_P4	EM				
	L		CS	ED	MA	MA			SP	
Thursday	R	MA	ED	CS	PH	ED				
	S		ED_P1, CS_P2, PH_P3, EM_P4	EM	EM	ED				
	T		CS	ED	EM_P1, ED_P2, CS_P3, PH_P4	ED				
	U		EM	MA	CS	ED				
	L		ED	EM_T1, MA_T3	EM_T2, MA_T4					
Friday	R		ED		MA_T3	MA_T4				
	S	MA	EM_P1, ED_P2, CS_P3, PH_P4	EM	CS	PH				
	T		CS	ED	MA	EM				
	U		PH	EM	EM_P1, ED_P2, CS_P3, PH_P4	ED				
	L		PH	PH_T3, EM_T4	EM_T3, PH_T4	EM	MA		EM_T1, MA_T3	EM_T2, MA_T4

Student shall attend classes as per their section/roll No

Abbreviation for Courses:
 PH - Physics,
 MA - Mathematics-I,
 EM - Engineering Mechanics,
 ED - Engineering Drawing,
 CS - Communication Skills,
 SP - Sports

Room Nos:
 Section R : CRC-2.1
 Section S : CRC-2.2
 Section T : CRC-2.3
 Section U : CRC-2.4
 Section L : CRC-3.1

CRC - Class Room Complex

Engg. Drawing Practical (ED.P) will conduct at CRC-0.2

Each section is divided into four batches for Practical and Tutorial.

PH_P1 is Physics lab for 1st Batch
 EM_T2 is Engg. Mechanics tutorial for Batch 2.

Room Numbers for Tutorial and Practical will be displayed by the respective Department. Course coordinator/teacher will announce the Room numbers in the class.

Dean (Academic)



VISVESVARAYA NATIONAL INSTITUTE OF TECHNOLOGY, NAGPUR – 440 010 (INDIA)

First Year B. Tech. (2019-20)

Time Table for First Semester (W, X, Y, Z & N Sections)

Day	Section	1 8.00-8.55 am	2 9.00-9.55 am	3 10.00-10.55 am	4 11.00-11.55 am	5 12.00-12.55 pm	6 2.00-2.55 pm	7 3.00-3.55 pm	8 4.00-4.55 pm	9 5.00-5.55 pm	Chemistry Stream
Monday	W	MA	CP	EE	SS	CH					Student shall attend classes as per their section/Roll No Abbreviation for Courses: CH-Chemistry, MA-Mathematics-I, EE-Electrical Engineering CP-Computer Programming SS-Social Science, SP-Sports Room Nos: Section W : CRC 1-1 Section X : CRC 1-2 Section Y : CRC 1-3 Section Z : CRC 1-4 Section N : CRC 3-2 CRC - Class Room Complex Each section is divided into four batches for Practical and Tutorial. CH_P1 is Chemistry lab for 1 st Batch EE_T2 is Electrical Engg. Tutorial for Batch 2
	X		CH_P1, EE_P2, CP_P3, WS_P4	MA	CH	CH_T2, EE_T4	WS_P1, EE_T2, MA_T3, CH_T4	EE_T1, CH_T3			
	Y		CH	MA	CH_P1, EE_P2, CP_P3, WS_P4	EE	CH	WS_P1, WS_P2, MA_T4	SP		
	Z		EE_T2, CH_T4	CP	EE	EE	CH	CH_T1, EE_T3	CH_T2, EE_T4	CH_P1, EE_P2, CP_P3, WS_P4	
	N	CP	EE		MA_T1, MA_T2, WS_P3, WS_P4	MA_T1, MA_T2, WS_P3, EE_P4	EE_T4	CP_P1, WS_P2, CH_P3, EE_P4			
Tuesday	W	CP	MA		CP	WS_P1, WS_P2, WS_P3, WS_P4	CP_P1, EE_T3	EE_T4			Room Nos: Section W : CRC 1-1 Section X : CRC 1-2 Section Y : CRC 1-3 Section Z : CRC 1-4 Section N : CRC 3-2 CRC - Class Room Complex Each section is divided into four batches for Practical and Tutorial. CH_P1 is Chemistry lab for 1 st Batch EE_T2 is Electrical Engg. Tutorial for Batch 2
	X	MA	WS_P1, CH_P2, EE_P3, CP_P4	SS	EE	EE	MA_T1	MA_T3	EE_P1, CP_P2, WS_P3, CH_P4		
	Y		SS	MA	EE	EE	CP	WS_P2, WS_P3, WS_P4			
	Z		CP	MA	WS_P1, CH_P2, EE_P3, CP_P4	CH	CP	MA_T1	SP		
	N	EE	CP	MA	MA	CH	EE	WS_P2, WS_P3, WS_P4			
Wednesday	W		CP	EE	EE_T1, CH_T3	EE_T2, CH_T4					Room Nos: Section W : CRC 1-1 Section X : CRC 1-2 Section Y : CRC 1-3 Section Z : CRC 1-4 Section N : CRC 3-2 CRC - Class Room Complex Each section is divided into four batches for Practical and Tutorial. CH_P1 is Chemistry lab for 1 st Batch EE_T2 is Electrical Engg. Tutorial for Batch 2
	X		MA	CH_T1, EE_T3	CP	EE	CP_P1, WS_P2, CH_P3, EE_P4	WS_P1, CH_P2, EE_P3, CP_P4			
	Y	SS	CH	MA	EE	CP	CH_T1, EE_T3	CH_T2, EE_T4			
	Z	MA	EE_T1, CH_T3	CP	CP_P1, WS_P2, CH_P3, EE_P4	CP	CP	MA_T1	SP		
	N	MA	WS_P1, CH_P2, EE_P3, CP_P4	CP	CH	SS	SS	CH_T1, EE_T3	CH_T2, EE_T4		
Thursday	W	EE	CH	SS	MA						Room Nos: Section W : CRC 1-1 Section X : CRC 1-2 Section Y : CRC 1-3 Section Z : CRC 1-4 Section N : CRC 3-2 CRC - Class Room Complex Each section is divided into four batches for Practical and Tutorial. CH_P1 is Chemistry lab for 1 st Batch EE_T2 is Electrical Engg. Tutorial for Batch 2
	X		SS	CH	EE_P1, CP_P2, WS_P3, CH_P4						
	Y	MA	CP_P1, WS_P2, CH_P3, EE_P4	EE_T1, CH_T3	EE_T2, CH_T4	EE	EE	MA_T1, WS_P2, WS_P3, WS_P4	WS_P1, CH_P2, EE_P3, CP_P4		
	Z	CP	CH	EE	SS	MA	MA	CH_T1, EE_T3	CH_T2, EE_T4		
	N			EE	CP	MA	MA	MA_T1	MA_T3		
Friday	W		CH		WS_P1, WS_P2, MA_T3, MA_T4						Room Nos: Section W : CRC 1-1 Section X : CRC 1-2 Section Y : CRC 1-3 Section Z : CRC 1-4 Section N : CRC 3-2 CRC - Class Room Complex Each section is divided into four batches for Practical and Tutorial. CH_P1 is Chemistry lab for 1 st Batch EE_T2 is Electrical Engg. Tutorial for Batch 2
	X	MA	SS	CH	EE	CP	EE_P1, CP_P2, WS_P3, CH_P4	CH_P1, EE_P2, CP_P3, WS_P4	CH_P1, EE_P2, CP_P3, WS_P4		
	Y	CH	WS_P1, CH_P2, EE_P3, CP_P4	EE	CP	EE	EE	MA_T2, WS_P3, WS_P4	EE_P1, CP_P2, WS_P3, CH_P4	MA_T4	
	Z		CH	EE	EE_P1, CP_P2, WS_P3, CH_P4	CP	CP	WS_P1, MA_T2, MA_T4	MA_T2		
	N	EE	WS_P1, WS_P2, MA_T3, MA_T4	EE	SS	CH	CH	EE_T1, CH_T3	EE_T2, CH_T4	SP	

Room Numbers for Tutorial and Practical will be displayed by the respective Department. Course coordinator/teacher will announce the Room numbers in the class.

Dean (Academic)

**List of Faculty Mentors for First Year B Tech. (2019-20)**

SN	Name of Faculty Mentor	Department	Batch	Extn Mobile No.	Email ID
1.	Dr. O. R. Jaiswal	Applied Mechanics	L3 + L4	2801212 9822579142	orjaiswal@apm.vnit.ac.in
2.	Dr. A. P. Khatri	Applied Mechanics	U1 + U2	2801581 9823357135	ashishkhatri@apm.vnit.ac.in
3.	Dr. Ratnesh Kumar	Applied Mechanics	R3 + R4	2801582 9372548232	ratneshkumars@apm.vnit.ac.in
4.	Dr. M. D. Goel	Applied Mechanics	T1 + T2	2801419 7722043252	mdgoel@apm.vnit.ac.in
5.	Dr. C. Das	Chemistry	Y3 + Y4	2801601 9860444125	chayandas@chm.vnit.ac.in chayandas@hotmail.com
6.	Dr. (Mrs.) Ramani Motghare	Chemistry	N1 + N2	2801603 9422510403	rkkawadkar@chm.vnit.ac.in
7.	Dr. S. Halder	Chemistry	X1 + X2	2801883 9609965466	sandipanhalder@chm.vnit.ac.in
8.	Dr. A. Wankhade	Chemistry	Z3 + Z4	2801609 9423402441	atulwa2006@yahoo.co.in
9.	Dr. B. Dash	Humanities	S3 + S4	2801352 7978744159	dr.bibhudattadash@gmail.com
10.	Dr. Jaipal	Humanities	U3 + U4	2801352 9030704237	jaipalmnit@gmail.com
11.	Dr. G. N. Nimbarte	Humanities	Z1 + Z2	2801435 9373045542	gnimbarte@hum.vnit.ac.in
12.	Dr. B. R. Mishra	Humanities	W3 + W4	918280303656 7008090162	bibhutieco@gmail.com
13.	Dr. O. Subohi	Physics	L1 + L2	2801837 9755990799	oroosa@gmail.com
14.	Dr. Ramkarthik	Physics	S1 + S2	2801835 9168720324	msramkarthik@phy.vnit.ac.in
15.	Dr. K. Mohan Kant	Physics	R1 + R2	2801180 8275866144	mohankant@phy.vnit.ac.in
16.	Dr. S. Patrikar	Physics	T3 + T4	2801174 9970716688	sujatapatrikar@phy.vnit.ac.in
17.	Dr. S. Pradhan	Mathematics	Y1 + Y2	2801405 8145994809	spiitkqp@gmail.com
18.	Dr. J. Singh	Mathematics	N3 + N4	2801413 7715060524	jyotisingh@math.vnit.ac.in
19.	Dr. S. Kumar	Mathematics	X3 + X4	2801414 7338007559	sathishkumar@math.vnit.ac.in
20.	Dr. D. Patel	Mathematics	W1 + W2	2801412 9376986361	deepesh456@gmail.com



OTHER INFORMATION

Director

Dr. P M Padole
0712 280 1370, 2223969 (Fax)
director@vnit.ac.in

Warden HB-2

Dr. R P Vijayakumar
0712 280 1782,1679
9970335592

Dean (Academic)

Dr. S B Thombre
0712 2801301
deanacd@vnit.ac.in

Dr. G N Nibarte
0712 280 1435,1622
9373045542

Dean (Faculty Welfare)

Dr. D R Peshwe
0712 2801302
deanadm@vnit.ac.in

Dr. Vishnu Pratap Singh
0712 280 1449,1946
7983881146

Dean (Planning & Development)

Dr. G P Singh
0712 2801300
deanp_f@vnit.ac.in

Warden GH-Old

Dr. Neeta Patne
0712 280 1140,1101,1611
09860432387

Dean (Research & Consultancy)

Dr. V B Borghate
0712 2801304
deanr_d@vnit.ac.in

Dr. Poonam Sharma
0712 280 1596,1347
9826090830

Dean (Student Welfare)

Dr. B S Umare
0712 2801320
deanstd_coun@vnit.ac.in

Account Section	0712 2801242
Academic Section	0712 2801241
Examination Cell	0712 2801278
T & P	0712 2801258
Security Section	0712 2801222
Hostel Section	0712 2801233
Guest House	0712 2801221
Health Center	0712 2801342
Physical Education	0712 2801232

Associate Dean (Hostel Affairs)

Dr. D H Lataye
0712 2801086
deanadm@vnit.ac.in

Dy. Registrar (Acad)

Mr. K N Dakhale
0712 2801365
dr_acd@vnit.ac.in

Asstt. Registrar (Exam)

Mr. Nikhil Chingalwar
0712 2801392/1812/1278
asst_registrar@vnit.ac.in

For Student's Medical Emergency

Ambulance: 862 305 6246

CIIMS HOSPITAL, Bajaj Nagar , NAGPUR,
Phone No: - 2236441/2237662

WOCKHARDT HOSPITAL

27, Corporation Colony, Near Shankar Nagar Square,
North Ambhazari Road, NAGPUR.
Phone No: - 224844/6534444

KRIMS HOSPITAL

275, Central Bazar Road , Ramdaspath
NAGPUR. Phone No: - 6614564-65

CARE HOSPITAL

Farmland, Panchasheel Square,
NAGPUR. Phone No: - 3982444/3982222

RATHI NURSING HOMEPlot No. 40, Balraj Marg, Dhantoli ,
NAGPUR. Phone:-2420044

Asstt. Registrar (Hostel)

Mrs. A A Ansingkar
0712 2801373
hostelmanager@vnit.ac.in

Medical Officer

Dr. Pankaj Dhule
0712-2801342, 09422104694
medicalofficer@vnit.ac.in



Visvesvaraya National Institute of Technology, Nagpur

South Ambazari Road, Nagpur, Maharashtra. Pin 440010 (India)

Phone: (+91-712-) 2222828, 2224123, 2231636, 2226750, 2223710, 2236330, 2236331, 2236332

FAX: (+91-712-) 2802200, 222323