BANGALORE UNIVERSITY

UNIVERSITY VISVESVARAYA COLLEGE OF ENGINEERING

K R Circle, Bengaluru- 560 001.

Choice Based Credit System (CBCS) -2018

Scheme of Teaching and Examination
for I Semester and II Semester B. Tech.
(Common to all programmes except B.Arch.)

Bangalore University
University Visvesvaraya College of Engineering, Bengaluru
Programmes: B.Tech. – 1. Electronics & Communication Engineering   2. Electrical & Electronics Engineering
3. Computer Science and Engineering

Choice Based Credit System – Physics Cycle
Scheme of Teaching and Examination for I Semester B.Tech.

Sl. No.	Course Code	Title	Teaching Department	Hours/Week				Total Hr/week	CIE Marks	*SEE Marks	Credits
				L	T	P	SS				
1	18BSEM101	Engineering Mathematics –I	Mathematics	2	2	0	0	4	50	50	3
2	18BSEP102	Engineering Physics - Theory	Physics	2	2	0	0	4	50	50	3
3	18BSEP103	Engineering Physics - Practical	Physics	0	0	3	0	3	50	50	1.5
4	18ESME104	Workshop & Manufacturing Practices	Mechanical	2	0	4	0	5	50**	50	3
5	18ESEE105	Basic Electrical Engineering- Theory	Electrical	2	2	0	0	4	50	50	3
6	18ESEE106	Basic Electrical Engineering- Practical	Electrical	0	0	3	0	3	50	50	1.5
7	18ESEC107	Basic Electronics	ECE	2	2	0	0	4	50	50	3
8	18HSPE108	Professional English	English	2	0	2	0	4	50	50	3
9	18MCIP109	Induction Program	College	1 week					50	--	1
		Total		12	8	12	0	32	450	400	22
		Total Marks		850							

*SEE shall be conducted for 100 marks and the marks obtained is to be reduced for 50 marks.
** CIE for 18ESME104 shall be conducted for 100 marks and the marks obtained is to reduced for 50 marks.

Choice Based Credit System – Chemistry Cycle
Scheme of Teaching and Examination for II Semester B.Tech.

Sl. No.	Course Code	Title	Teaching Department	Hours/Week				Total Hr/week	CIE Marks	*SEE Marks	Credits
				L	T	P	SS				
1	18BSEM201	Engineering Mathematics –II	Mathematics	2	2	0	0	4	50	50	3
2	18BSCH110	Engineering Chemistry - Theory	Chemistry	2	2	0	0	4	50	50	3
3	18BSCH111	Engineering Chemistry- Practical	Chemistry	0	0	3	0	3	50	50	1.5
4	18ESME112	Engineering Graphics & Design	Mechanical	2	0	4	0	6	50	50	4
5	18ESCV113	Engineering Mechanics	Civil	2	2	0	0	4	50	50	3
6	18ESCS114	Programming for Problem Solving - Theory	Computer Science	2	2	0	0	4	50	50	3
7	18ESCS115	Programming for Problem Solving - Practical	Computer Science	0	0	3	0	3	50	50	1.5
8	18MCKN116	Kannada	Kannada	1	0	0	0	1	50	--	1
		Total		11	8	10	0	29	400	350	20
		Total Marks		750							

*SEE shall be conducted for 100 marks and the marks obtained is to be reduced for 50 marks.

Choice Based Credit System – Chemistry Cycle
Scheme of Teaching and Examination for I Semester B.Tech.

Sl. No.	Course Code	Title	Teaching Department	Hours/Week				Total Hr/week	CIE Marks	*SEE Marks	Credits
				L	T	P	SS				
1	18BSEM101	Engineering Mathematics –I	Mathematics	2	2	0	0	4	50	50	3
2	18BSCH110	Engineering Chemistry - Theory	Chemistry	2	2	0	0	4	50	50	3
3	18BSCH111	Engineering Chemistry- Practical	Chemistry	0	0	3	0	3	50	50	1.5
4	18ESME112	Engineering Graphics & Design	Mechanical	2	0	4	0	6	50	50	4
5	18ESCV113	Engineering Mechanics	Civil	2	2	0	0	4	50	50	3
6	18ESCS114	Programming for Problem Solving - Theory	Computer Science	2	2	0	0	4	50	50	3
7	18ESCS115	Programming for Problem Solving - Practical	Computer Science	0	0	3	0	3	50	50	1.5
8	18MCKN116	Kannada	Kannada	1	0	0	0	1	50	--	1
9	18MCIP109	Induction Program	College	1 week					50	--	1
		Total		12	8	10	0	30	450	350	21
		Total Marks		800							

*SEE shall be conducted for 100 marks and the marks obtained is to be reduced for 50 marks.

Choice Based Credit System – Physics Cycle
Scheme of Teaching and Examination for II Semester B.Tech.

Sl. No.	Course Code	Title	Teaching Department	Hours/Week				Total Hr/week	CIE Marks	*SEE Marks	Credits
				L	T	P	SS				
1	18BSEM201	Engineering Mathematics –II	Mathematics	2	2	0	0	4	50	50	3
2	18BSEP102	Engineering Physics - Theory	Physics	2	2	0	0	4	50	50	3
3	18BSEP103	Engineering Physics - Practical	Physics	0	0	3	0	3	50	50	1.5
4	18ESME104	Workshop & Manufacturing Practices	Mechanical	2	0	4	0	5	50**	50	3
5	18ESEE105	Basic Electrical Engineering- Theory	Electrical	2	2	0	0	4	50	50	3
6	18ESEE106	Basic Electrical Engineering- Practical	Electrical	0	0	3	0	3	50	50	1.5
7	18ESEC107	Basic Electronics	ECE	2	2	0	0	4	50	50	3
8	18HSPE108	Professional English	English	2	0	2	0	4	50	50	3
		Total		11	8	12	0	31	400	400	21
		Total Marks		800							

*SEE shall be conducted for 100 marks and the marks obtained is to be reduced for 50 marks.
** CIE for 18ESME104 shall be conducted for 100 marks and the marks obtained is to reduced for 50 marks.

Course Code	**18MCIP109**		
Category	-----		
Course title	**Induction Program**		
Scheme and Credits	Duration	Credits	Semester – I (All programs)
	1 Week	1	
CIE Marks: 50	SEE Marks: NA	Total Max. Marks:100	Duration of SEE: NA
Prerequisites (if any): NIL			

Induction Program:

When new students enter an institution, they come with diverse thoughts, backgrounds and preparations. It is important to help them adjust to the new environment and inculcate them the ethos of the institution with a sense of larger purpose.

Objectives:

The purpose of induction program is to make the students feel comfortable in their new environment, open them up, set a healthy routine, create bonding in the batch as well as between faculty and students, develop awareness, sensitivity and understanding of the self, people around them, society at large and nature.

Activities during induction Program:

i. Physical Activity : Games to help develop team work, yoga, gardening, etc
ii. Creative Arts: Each student would engage in art-Visual or Performing to help in creative expression
iii. Universal Human values: Make aware of universal human values among students for better behaviour.
iv. Lectures by eminent people: This will motivate the students to plan for better future in their professional life.
v. Visits: Visits to all departments, University, hostel and local important places.
vi.

Scheme for Assessing students: One credit shall be awarded to a student who participates in the all the activities of the induction program.

BANGALORE UNIVERSITY
DEPARTMENT OF CIVIL ENGINEERING, UVCE,
BENGALURU TITLE: ENGINEERING MECHANICS

Course Code	**18ESCV113**				
Category	Engineering Science Courses				
Course title	**Engineering Mechanics**				
Scheme and Credits	No. of Hours/Week				Semester – I and II (cycle)
	L	T	P	SS	Credits	
	2	2	0	0	3	
CIE Marks: 50	SEE Marks: 50		Total Max. Marks: 100		Duration of SEE: 3Hrs
Prerequisites (if any): NIL					

Course Learning Objective:
1. The course aims in understanding the laws and principles of Engineering mechanics to field problems.
2. Basic introduction to both statics and dynamics principles will be dealt.
3. Topics on resultant and equilibrium of coplanar force system, Analysis of trusses, Friction, Centroid and Moment of Inertia of plane areas, kinetics, work and energy are dealt.
4. An understanding of the assumptions and limitations of the approaches used.
5. The ability to analyze and solve simple problems in mechanics.

Unit I: Resultant of coplanar force system: Classification of force system, principle of transmissibility of a force, composition of forces, resolution of a force, Free body diagrams, moment , Principle of moments, couple, Resultant of coplanar concurrent force system, Resultant of coplanar parallel force system, Resultant of coplanar non - concurrent force system, Numerical problems. **(9Hrs)**

Unit II: Equilibrium of coplanar force system: Equilibrium of coplanar concurrent force system, Lami's theorem, Equilibrium of coplanar parallel force system, types of beams, types of loadings, types of supports, Equilibrium of coplanar non - concurrent force system, support reactions of statically determinate beams subjected to various types of loads, Numerical Problems. **(9 Hrs)**

Unit III: Analysis of Trusses: Introduction, Classification of trusses, analysis of plane perfect trusses by the method of joints and method of sections, Numerical problems.
Friction: Theory of friction, laws of dry friction, equilibrium of block on horizontal plane, equilibrium of block on inclined plane, analysis of ladder friction, analysis of wedge friction, Numerical problems. **(10 Hrs)**

Unit IV: Centroid of Plane areas: Locating the centroid of rectangle, triangle, semicircle, quadrant of a circle and sector of a circle using method of integration, centroid of composite areas and simple built up sections, Numerical problems.

Moment of inertia of plane areas: Rectangular moment of inertia, polar moment of inertia, product of inertia, radius of gyration, parallel axes theorem, perpendicular axis theorem, moment of inertia of rectangular, triangular and circular areas from the method of integration, moment of inertia of composite areas and simple built up sections, Numerical problems. **(10Hrs)**

Unit V: Kinetics: D'Alembert's principle of dynamic equilibrium, kinetics of curvilinear motion on horizontal plane. Banking and super elevation, Design speed, maximum speed, minimum speed, motion on level circular path and motion on banked circular path, Numerical Problems.

Work and Energy: Potential energy, kinetic energy, work done by a force, work-energy equation, work done by a force on spring, virtual work, principles of virtual work, Numerical problems.
(10Hrs)

Text Books:
1. Engineering Mechanics by S.S Bhavikatti, New Age International Publishers,2004.
2. Engineering Mechanics by R.K. Bansal, Laxmi Publications,2005.

Reference Books:
1. Engineering Mechanics by Ramamrutham S, UBS Publishers,2016
2. Mechanics for Engineers by Beer and Johnston, McGraw HilolBook Company Inc, New york.
3. Engineering Mechanics by Timoshenko and Young, 5thEdn, McGraw India,2013
4. Schaum's outline of Engineering Mechanics by E.Nelson, 6thEdn, McGraw Hill, US, 2011.
5. Engineering Mechanims by Singer F. L, III Edition, Harper Internatioanals,1994.

Scheme of Examination:

CIE – 50 marks	Test I (Unit I, II &III)- 20 marks	Quiz I – 5 marks	25 Marks	Total:50 marks
	Test II (Unit IV & V) – 20 marks	Quiz II – 5 marks	25 Marks	
SEE – 100 marks	• **Q1 (compulsory):** MCQs or short answer type questions for 15 marks covering entire syllabus.		15 Marks	Total:100 marks
	• **Q2 & Q 3** from Unit-I and Unit-II respectively, shall be answered compulsorily and will not have internal choice.		17 * 2 = 34 Marks	
	• **Q4, Q5 and Q6** from Unit-III, Unit-IV & Unit-V respectively, shall have internal choice.		17*3= 51 Marks	

Course Outcomes:
CO1: The concept and behaviour of forces, moments of forces on rigid bodies, Resultant of equilibrium of force system.
CO2: Analysis of trusses and Resistance to applied forces for different conditions CO3: Properties of area of different geometrical figures and engineering sections CO4: Perception of bodies under motion
CO5: Application of energy principles to engineering problems.

BANGALORE UNIVERSITY
DEPARTMENT OF MECHANICAL ENGINEERING, UVCE, BENGALURU
TITLE: WORKSHOP AND MANUFACTURING PRACTICES

Course Code	**18ESME104**				
Category	Engineering Science Courses				
Course title	**Workshop and Manufacturing Practices**				
Scheme and Credits	No. of Hours/Week				Semester – I and II (cycle)
	L	T	P	SS	Credits	
	1	0	4	0	3	
CIE Marks: 50**	SEE Marks: 50	Total Max. Marks: 100		Duration of SEE: 3Hrs	
Prerequisites (if any): NIL					

**CIE shall be conducted for 100 marks and the marks obtained is to be reduced for 50 marks.

Course Objectives:
The objectives of course are to:
1. Impart engineering students the knowledge of different manufacturing processes employed in producing products.
2. Train the students to use basic tools used in Carpentry, Welding, Fitting, Sheet metal and Soldering.
3. Understand the working of different mechanical devices by way of demonstration of the working of basic machine tools of machine shop, steps involved in metal casting, smithy and producing plastic components.
4. Equip the students the knowledge and skill to produce simple components.

I. Manufacturing Practices Section--- (1 Hr/Week, Max-14hrs)
   Detailed contents: Lectures and Videos
1. Introduction to manufacturing methods like Casting, Forming, Machining, Joining, Sheet Metal and Advanced Manufacturing Methods.
2. CNC machining, Additive manufacturing.
3. Carpentry, Fitting operations and use of power tools
4. Metal Casting , Plastic molding, Glass cutting
5. Welding (Arc welding & Gas welding), Brazing and Soldering.

II. Workshop Practice Section: (04 hours per week of Workshop practice including
                                demonstration and videos)
Detailed contents:
1. Fitting shop
2. Carpentry
3. Welding shop
4. Sheet metal &Soldering
5. Machine Shop
6. Casting
7. Smithy
8. Plastic molding

Training and Examination shall involve the actual fabrication of simple components/models, utilizing one or more of the techniques involved in Sl.No. 1 to 4 of the contents and Sl.No. 5 to 8of contents are for demonstration purpose only.

Course Outcomes (COs)

CO1: Upon completion of Manufacturing Practices section course, the students will gain the knowledge of the different manufacturing processes which are commonly employed in the industry to fabricate components using different materials.
CO2: Students will be able to fabricate simple components using the tools of basic workshop.
CO3: They will also get practical knowledge of the dimensional accuracies possible with a few different manufacturing processes.
CO4: They will also get the practical knowledge to produce small components based on the skill acquired in the workshop practice.

Text Books:
1. Hajra Choudhury S.K., Hajra Choudhury A.K. and Nirjhar Roy S.K., "Elements of Workshop Technology", Vol. I 2008 and Vol. II 2010, Media promoters andpublishers private limited,Mumbai.
2. Kalpakjian S. And Steven S. Schmid, "Manufacturing Engineering and Technology", 5th edition, Pearson Education India Edition,2009.
3. R.K Rajput, "Comprehensive Workshop Practice", New edition, Laxmi PublicationPvt. Ltd, New Delhi, 2001.

Reference Books:
1. Gowri P. Hariharan and A. Suresh Babu, "Manufacturing Technology – r'Pearson Education,2008.
2. RoyA.Lindberg,"ProcessesandMaterialsofManufacture",4thedition,PrenticeHall India,1998.
3. Rao RN., "Manufacturing Technology", Vol. I and Vol. II, Tata McGrawHill House, 2017.

Open Sources:
1. Manufacturing Methods-https://www.youtube.com/watch?v=JT7RcMPuDS0
2. Sand Casting- https://www.youtube.com/watch?v=M95bhPrDwA0 https://www.youtube.com/watch?v=pwaXCko_Tkw
3. Extrusion- https://www.youtube.com/watch?v=Y75IqksBb0M&list=PLGU2Neype87oEz_UgbQB1A L3B3ouxY773
4. Rolling- https://www.youtube.com/watch?v=KRn73gKQ2YU&list=PLGU2NEype87oEz_UGbQB 1AL3B3ouxY773&index=2
5. Forging-https://www.youtube.com/watch?v=XTU0Z-FkhtU
6. Machining Tools- https://www.youtube.com/watch?v=J63dZsw7Ia4&list=PLTtHMa9EgF9auYED8aaATZX L-qtWT_B9V
7. Turning-https://www.youtube.com/watch?v=8EsAxOnzEms
8. Drilling-https://www.youtube.com/watch?v=om6GQKfoS1g
9. Welding-https://www.youtube.com/watch?v=CCzhT81GrBo
10. Brazing-https://www.youtube.com/watch?v=UL37hjhKEjk
11. Soldering-https://www.youtube.com/watch?v=BLfXXRfRIzY
12. Fasteners-https://www.youtube.com/watch?v=R3w2XWOwYS8
13. EDM- https://www.youtube.com/watch?v=L1D5DLWWMp8&list=PL5xUm4VtvsTwmPGNIIrN C3mB0YwsbJa37

14	Thermal & Abrasive Water jet Cuttinghttps://www.youtube.com/watch?v=NOiXh80_jXU&list=PL5xUm4VtvsTwmPGNIIrNC3mB0YwsbJa37&index=2
15	future Manufacturing-https://www.youtube.com/watch?v=KyWuHcvyqD0
16	CNC Machining- https://www.youtube.com/watch?v=QTi7dnwYTVw https://www.youtube.com/watch?v=MVYb1u1xbqk
17	additive manufacturing-https://www.youtube.com/watch?v=2talsoMagAk
18	fitting operations-https://www.youtube.com/watch?v=A9m_3onoVV8
19	Electrical &Electronics
20	Carpentry-https://www.youtube.com/watch?v=YVXnL3LECpc
21	Plastic injection moulding- https://www.youtube.com/watch?v=b1U9W4iNDiQ
22	Glass cut-https://www.youtube.com/watch?v=gfmRLTxVFmg
23	Arc welding- https://www.youtube.com/watch?v=DIf_l8l5BkYhttps://www.youtube.com/watch?v=TeBX6cKKHWY
24	Gas Welding-https://www.youtube.com/watch?v=6o6XWWbWvIU
25	Brazing-https://www.youtube.com/watch?v=m678-clpbjw

Scheme of Evaluation and Examination

1. Scheme of Evaluation for CIE:

    (a) Workshop Practice: Max Marks =50

        (i)   Fitting and welding models: 10 +5Marks =   15 Marks

        (ii)   Carpentry and Sheet Metal: 10+ 5marks=   15Marks
           (2 models to be made in each workshop section)

        (iii)   Manufacturing Practices Section   Quiz=   5 Marks
                                         Test=   15 Marks
                                    Total=   50 Marks

    (b) Manufacturing Practices: Max Marks =50
        (i)   Quiz-I = 05Marks
        (ii)   Test –I = 20Marks
        (iii)   Quiz-II = 05Marks
        (iv)   Test-II = 20Marks

                                 Total=   50 Marks

Note: Average of CIE Marks of (a) and (b) shall be considered as CIE marks of course.

2. Scheme of Evaluation for SEE: Max Marks=100   Examination : 3Hours
        (i)   Major Model (Fitting or Carpentry)   =   50 Marks
        (ii)   Minor Model (Welding or Sheet metal)   =   30 Marks
        (iii)   VivaVoce Examination   =   20 Marks
                            Total = 100 Marks

SEE shall be conducted for 100 marks and the marks obtained shall be reduced to 50 marks.

Course Code	18ESME112				
Category	Engineering Science Courses				
Course title	**Engineering Graphics & Design**				
Scheme and Credits	No. of Hours/Week				Semester – I and II (cycle)
	L	T	P	SS	Credits	
	2	0	4	0	4	
CIE Marks: 50	SEE Marks: 50	Total Max. Marks: 100			Duration of SEE: 3Hrs
Prerequisites (if any): NIL					

 Course Objectives:
1. To expose the students to learn the basics of communication of Engineering drawings as per BIS convention.
2. To provide basic principle and various aspects of Engineering graphics and Design that involves learning of orthographic projection of various two dimensional (2D) and three dimensional (3D) geometry primitives in two dimensions.
3. To apply the basics of surface and solid geometry to view the sectional details and develop the lateral surface of solids and transition pieces.
4. To apply the principles of isometric projection and represent the objects in three dimension based on orthographic projection and vice versa.
5. To expose the students to create simple 2D and 3D objects followed by understanding of different geometric modeling approaches using a CAD software.

UNIT I: (i) Introduction to Engineering Drawing:
Principles of Engineering Graphics and their significance, B.I.S. conventions for Engineering Graphics, Dimensioning, Use of instruments, Simple geometrical constructions, Constructions of polygons, lettering, Concept of R.F. (Representative Fraction) in scales.   **(4hrs)**

(ii) Orthographic Projections:
Concept of Orthographic projection; Projection of points in different quadrants, emphasizing on First Angle Projection.   **(4hrs)**
Projection of Straight Lines: Projection of lines in simple Positions, inclined to one plane and parallel to other plane, inclined to both planes. To find true length and true inclinations, Simple practical problems.   **(6hrs)**

UNIT II: Projections of Plane Surfaces:
Projection of right regular plane surfaces: triangle, square, rectangle, pentagon, hexagon and circle (without through holes) by change of position and auxiliary plane methods.   **(6hrs)**

UNIT III: Projections of Regular Solids:
Projection of simple and right regular solids: Prisms, Pyramids, Cones and Cylinder (without through holes) by change of position and auxiliary plane methods.   **(10hrs)**

UNIT IV: (i) Sections and Sectional Views of Right Regular Solids:
Drawing the sectional orthographic views and auxiliary views (true shape of section) of geometrical solids: Prisms, Pyramids, Cone and Cylinder.   **(8hrs)**

(ii) Development of Lateral Surfaces of Right Regular Solids:
Development of lateral surfaces of right regular solids in simple position and truncated solids: Prisms, Pyramids, Cone and Cylinder. Development of transition pieces. **(6hrs)**

UNIT V: (i) Isometric Projections: Principles of Isometric projections, Isometric Scale, Isometric Views, Conventions; Isometric projections of right regular solids viz. prisms, pyramids, cone, cylinder and their frustums and sphere and combination of any two of these solids. (**6hrs**)
(ii) Conversion of Views:
Drawingorthographicviewsfromgivenisometricviewofsimplemachineparts. (**4hrs**)

UNIT VI: Computer Aided Drafting, Computer-Hardware and Software and for CIE (Demonstration):
Listing the computer technologies that impact on graphical communication, Demonstrating knowledge of the theory of CAD software: AutoCAD- Hardware required, Screen Layout, Function Keys, Drawing Entity (Draw commands), Drafting Aids (Limits, Layers, Dimensioning, Object snap), Editing of Drawing (Modify commands), Symbol library(Block, Wblock, and Insert) 2D Drawings-simple machine parts, Floor plan and Building , 3D Drawing- Isometric drawings, 3D Geometric Modeling of simple machine parts. **(6hrs)**

Text Books:
1. Bhatt N.D., Panchal V.M. & Ingle P.R., (2017), "Engineering Drawing", 53rd Edition, Publishing House, Anand, Gujarat.
2. K.R. Gopal Krishna (2016, Combined volume) "Engineering Drawing", Subhas Publication.

Reference Books:
1. Basanth Agrawal & C.M Agrawal (2012), Engineering Graphics, Tata Mc Graw Hill Publications
2. Narayana K.L. & P. Kannaiah (2008), Text Book on Engineering Drawing, Scitech Publishers
3. CAD Software Theory and User Manuals

Course Outcomes:
The students at the end of the course will be competent to:
    CO1: Interpret the engineering drawings as per BIS convention.
    CO2: Draw the different views of 2D and 3D objects in orthographic projections and solve practical problems involving distances and inclinations.
    CO3: Visualize the sectional details of solids and determine the surface area of sheet metal required in practical applications.
    CO4: Draw primitive geometric objects and simple machine parts in two and three dimensions.
    CO5: Understand the capabilities of a typical CAD package for practical applications.

Scheme of Examination:

CIE – 50 marks	Module 1, 2 & 3	Sheets 10 marks
		Test I 10 marks
	(Module 4,& 5–	Sheets 10 marks
		Test II 10 marks
		Quiz on Computer Graphics – 10 marks
SEE – 100 marks (to be reduced to 50 marks)	• There shall be eight full questions to be set (Unit I, III shall have one full question each. Unit II, IV, V shall have two full questions each). • Each full question shall be for a maximum of twenty marks. • The Unit II, IV and V will have an internal choice. • Scheme of examination: Answer any Five full questions choosing at least One full question from Unit II, IV and V and questions of Unit I and III are to be answered compulsorily.	

BANGALORE UNIVERSITY
DEPARTMENT OF ELECTRICAL ENGINEERING, UVCE, BENGALURU
TITLE: BASIC ELECTRICAL ENGINEERING

Course Code	18ESEE105			
Category	Engineering Science Courses			
Course title	**Basic Electrical Engineering - Theory**			
Scheme and Credits	No. of Hours/Week			Semester – I and II (cycle)
	L	T	P	SS	Credits	
	2	2	0	0	3	
CIE Marks: 50	SEE Marks: 50	Total Max. Marks: 100	Duration of SEE: 3Hrs	
Prerequisites (if any): NIL				

Course Objectives:

1. To provide fundamental concepts of Electrical Engineering in DC circuits.
2. To provide fundamental concepts of Electrical Engineering in AC circuits.
3. To expose the students to the various AC and DC machines.
4. To familiarize equipment which are used in domestic and industrial applications.
5. To familiarize the Electrical installation components, wiring and measuring instruments.

Unit I: DC Circuits (Compulsory question)
Ohm's law, KCL, KVL, Mesh & Nodal analysis, circuit parameters energy storage aspects,
Superposition, Thevenin's Theorem, Star-delta transformation.   **(7hrs)**

Unit II: AC Circuits
R-L, R-C, R-L-C circuits (series & parallel) time constant, phasor representation, Response of R-L,
R-C & R-L-C circuits to sinusoidal input, Resonance-series & parallel RLC circuits, Q-factor,
Bandwidth, Measurement of three phase power with two wattmeter method.   **(9hrs)**

Unit III: Transformers (Compulsory question)
Construction & working principles of single phase transformer, EMF equation, equivalent circuit,
pre-determine efficiency& auto-transformer.   **(8hrs)**

Unit IV: AC, DC Machines
Construction and working principle of DC motor, generator characteristics-application of DC
machines, Construction & working principle of three phase induction motor, torque-slip characteristic
and applications, single phase induction motor-types and applications, three phase alternator:
construction &working principles.   **(12hrs)**

Unit V: Electrical Installations and Power Conversion
Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of Wires and
Cables, Earthing Measuring Instruments: Types of meters for AC & DC, Dynamo meter type
wattmeter, single phase energy meter & Megger. Types of Batteries, Important Characteristics of
Batteries. Elementary calculations for energy consumption, Introduction to Power Electronics – Two
Transistor Analogy of SCR, SCR characteristics, Power Electronic Converters – block diagram
approach.   **(10hrs)**

Text Books :

    i)   D.P. Kothari and I.J. Nagrath, "Basic Electrical Engineering", Tata McGraw hill, 2010.
                           (Units I to III)
    ii)   P.C. Sen, "Electrical Machines & Power Electronic", Wiley Pub.2013 (Units III to V)

Reference Books:

i)   D.C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2009.
ii) L.S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press, 2011.
iii) E. Hughes, "Electrical and Electronics Technology", Pearson,2010.
iv) V.D. Toro, "Electrical Engineering Fundamentals", Prentice Hall India, 1989.
v) M.D. Singh," Power Electronics" , Tata McGraw Hill Publisher,2008.

E-BOOKS:

a) http://nptel.ac.in/courses/108105053/
b) https://books.google.com/books?isbn=812192405

ON-LINE VIDEO LECTURES:

a) http://hptel.ac.in/courses/108108076/

Course Outcome:

The students at the end of the course will be able to

CO1: Understand the fundamental concepts of Electrical DC circuits.
CO2: Understand the fundamental concepts of Electrical AC circuits.
CO3: Usage of Transformer and equipments.
CO4: Usage of Electrical AC machines and DC machines.
CO5: Understanding and installation of Electrical protective devices, measuring instruments,
       battery storage system and Power Electronic Converters.

Scheme of Examination:

CIE – 50 marks	Test I (Unit I, II &III)- 20 marks	Quiz I – 5 marks	25 Marks	50
	Test II (Unit IV & V) – 20 marks	Quiz II – 5 marks	25 Marks	
SEE – 100 marks	• **Q1 (compulsory):** MCQs or short answer type questions for 15 marks covering entire syllabus.		15 Marks	100
	• **Q2 & Q3:** From Unit I & Unit III respectively, shall be answered compulsorily and will not have internal choice.		17 * 2 = 34 Marks	
	• **Q4, Q5 and Q:** From Unit II, Unit IV & Unit V respectively, shall have internal choice.		17*3= 51 Marks	

BANGALORE UNIVERSITY
DEPARTMENT OF ELECTRICAL ENGINEERING, UVCE, BENGALURU
TITLE: BASIC ELECTRICAL ENGINEERING LABORATORY

Course Code	**18ESEE106**				
Category	Engineering Science Courses				
Course title	**Basic Electrical Engineering - Practical**				
Scheme and Credits	No. of Hours/Week				Semester – I and II
	L	T	P	SS	Credits	(cycle)
	0	0	3	0	1.5	
CIE Marks: 50	SEE Marks: 50	Total Max. Marks: 100			Duration of SEE: 3Hrs
Prerequisites (if any): NIL					

Course Objectives:
1. To provide an exposure to common electrical components, their ratings and make electrical connections by wires of appropriate ratings.
2. To understand the usage of common electrical measuring instruments.
3. To understand the basic characteristics of transformers and electrical machines.
4. To understand VI characterization of electronic devices like diode, transistor (BJT) and SCR.
5. To get an exposure to the working of power electronic converters.

List of Experiments / Demonstrations:
1. Familiarization with passive components, function generator &oscilloscope
2. Step & frequency response of RC & RL circuits.
3. Two way / Three-way control of lamps.
4. Fluorescent lamp connections with capacitor and without capacitor.
5. Magnetization characteristics of DC shunt generator.
6. Torque speed characteristics of DC motor.
7. No-load & Short circuit test on single phase transformer & pre-determine the efficiency.
8. Torque-Slip characteristics of three phase Induction motor.
9. Diode characteristics.
10. Transistor characteristics.
11. SCR characteristics.
12. Demonstration of Power Electronics Converter.

Laboratory outcomes:
CO1: Get an exposure to common electrical components, their ratings and make electrical connections by wires of appropriate ratings.
CO2: Understand the usage of common electrical measuring instruments.
CO3: Understand the basic characteristics of transformers and electrical machines.
CO4: Understand VI characterization of electronic devices like diode, transistor (BJT) and SCR.
CO5: Get an exposure to the working of power electronic converters.

BANGALORE UNIVERSITY
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING, UVCE,
BENGALURU
Title: BASIC ELECTRONICS

Course Code	**18ESEC107**				
Category	Engineering Science Courses				
Course title	**BASIC ELECTRONICS**				
Scheme and Credits	No. of Hours/Week				Semester – I and II (cycle)
	L	T	P	SS	Credits	
	2	2	0	0	3	
CIE Marks: 50	SEE Marks: 50	Total Max. Marks: 100			Duration of SEE: 3 Hrs
Prerequisites (if any): NIL					

COURSE OBJECTIVES
1. To impart the working principles of semiconductor devices and their applications in electronic amplifier and regulator circuits.
2. To teach the working principles of different types of oscillator circuits.
3. To introduce operational amplifiers and to teach the realization of mathematical functions using them.
4. To learn the working principles of basic communication systems.
5. To provide the understanding of basic digital circuits and principles of logic design.

UNIT I
1. **Introduction to semiconductor devices**: Conductivity of a semiconductor, Fermi level in a semiconductor, Hall Effect. Introduction to Solar energy conversion, PN junction diodes, rectifiers and regulators, Zener diode characteristics, Zener regulated power supply. **(6hrs)**
   Transistor Characteristics: Principle, biasing, methods and stabilization, transistor as an amplifier, Common base configuration, Common emitter configuration and common collector configuration, with input and output characteristics, CE cut off region, CE saturation region, large signal, DC and small signal analysis, Current gain, operating point, biasing methods, Stabilization, decibel, Classification of power amplifiers, RC coupled amplifier and its frequency response, Transistor as switch, FET,MOSFETS,CMOS. **(12hrs)**

UNIT II
2. **Sinusoidal oscillators**: Concept of feedback, sinusoidal oscillators, working of RC phase shift, Colpitts and Hartley's oscillator using BJT's; Expressions for frequency of oscillation and condition for sustained oscillations, crystal oscillator(No derivations). **(5 hrs)**

UNIT III
3. **Operational Amplifiers** (OPAMP): Introduction, ideal OPAMP, need for OPAMP, OPAMP characteristics, OPAMP applications: voltage follower, addition and subtraction using OPAMP circuits, OPAMP integrating and differentiating circuits. **(6 hrs)**

UNIT IV
4. **Communication systems**: Block diagram of communication systems: Radio AM & FM, TV, Overview of Mobile communication, Satellite communication, optical communication, Modulation, Amplitude Modulation, Frequency spectrum, power relations, Frequency Modulation super heterodyne receiver, Transmitters. **(10 hrs)**

UNIT V

5. **Introduction to Digital Electronics**: Digital logic, binary logic symbols, basic theorems & properties of Boolean Algebra, De-Morgan's theorem. AND OR logic gate realizations using Transistor- Transistor Logic (TTL), MOS, CMOS, NMOS, PMOS. Symbols used for NOT, OR, AND, NAND, NOR, XOR gates and their truth tables, Realization of Boolean functions using basic gates. Realization of basic gates using universal gates.   **(9 hrs)**

Text Books:

1. Electronic Devices and Circuits By David A Bell, PHI, 5 edition ,2007 (UNIT I toIII)
2. Electronics Communication Systems, George Kennedy (TMH 4th edition).(UNITIV)
3. Digital Principles and Applications Albert paulMalvino, Donald P Leach, Goutamsaha, 6thed, Tata Mcgraw Hill. (UNIT V)

Reference Books:

1. Electronics Devices and Circuits" Millman and Halkias,TMH
2. Electronic Devices and circuit TheoryRobert L Boylestadand L.Neshelsky, Pearson Education, 9 edition,2005
3. Electronics Principles A.P. Malvino, TMH 6thedition.
4. Digital Logic and Computer Design, MorrisMano.
5. Communication Systems, Simon Haykin, Johnwiley.

E – books& Online Resources

1. http://gk12.poly.edu/amps-cbri/pdf/Basic%20Electronics.pdf,2012
2. http://www-f9.ijs.si/~gregor/ElektronikaVaje/ElectronicsLectures_GinGrich.pdf,

COURSE OUTCOMES: After successful completion of course, students will be able to
CO1: Analyze the working of Electronic circuits using Semiconductor Devices.
CO2: Realize Electronic circuits using Operational Amplifiers including mathematical modeling
CO3: Explain the working of Digital circuits and communication Systems

SCHEME OF EXAMINATION:

CIE – 50 marks	Test I (Unit I)- 20 marks	Quiz I – 5 marks	25 Marks	Total:50 marks
	Test II (Unit II, II, V) – 20 marks	Quiz II – 5 marks	25 Marks	
SEE – 100 marks	• **Q1 (compulsory):** MCQs or short answer type questions for 15 marks covering entire syllabus.		15 Marks	Total:100 marks
	• **Q2 & Q3** from Unit-I and Unit-V respectively, shall be answered compulsorily and will not have internal choice.		17 * 2 = 34 Marks	
	• **Q4, Q5 and Q6** from Unit-II, Unit-III & Unit-IV respectively, shall have internal choice.		17*3= 51 Marks	

BANGALORE UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING, UVCE, BENGALURU
Title: PROGRAMMING FOR PROBLEM SOLVING

Course Code	**18ESCS114**				
Category	Engineering Science Courses				
Course title	**Programming for Problem Solving -Theory**				
Scheme and Credits	No. of Hours/Week				Semester – I and II (cycle)
	L	T	P	SS	Credits	
	2	2	0	0	3	
CIE Marks: 50	SEE Marks: 50	Total Max. Marks: 100			Duration of SEE: 3 Hrs
Prerequisites (if any): NIL					

Course Objectives:

The students will be able to
1. Develop arithmetic reasoning and analytical skills to apply knowledge of basic concepts of programming to complex engineering problems
2. Learn basic principles of problem solving through programming
3. Write 'C' programs using appropriate programming constructs

Unit I: Introduction: Components of computer system, Variables and Arithmetic Expressions, Symbolic Constants, Character Input and Output, Arrays, Functions, Arguments-Call by Value, Character Arrays, External Variables and Scope.

Types, Operators, and Expressions: Variable Names, Data Types and Sizes, Constants, Declarations, Arithmetic Operators, Relational and Logical Operators, Type Conversions, Increment and Decrement Operators, Bitwise Operators, Assignment Operators and Expressions, Conditional Expressions, Precedence and Order of Evaluation.

Control Flow: Statement and Blocks, If-Else, Else-If, Switch, Loops-While and For, Loops-Do-While, Break and Continue, Goto and Labels.   **(8hrs)**

Unit II: Arrays: One Dimensional Arrays, Declaration of One -Dimensional Arrays, Initialization of One -Dimensional Arrays, Two-Dimensional Arrays, Initializing Two-Dimensional Arrays, Multi-Dimensional Arrays, Dynamic Arrays.

Declaring and Initializing String Variables, Reading Strings from Terminal, Writing Strings to Screen, Arithmetic Operations on Characters, Putting Strings Together, Comparison of Two Strings, String-handling Functions, Table of Strings.

Basic Algorithms: Linear Search, Binary Search, Bubble Sort, Insertion Sort and Selection Sort. Finding roots of equations, notion of order of complexity through example programs.   **(10 hrs)**

UNIT III: User-defined Functions: User-defined Functions, A Multi-function Program, Elements of User-defined Functions, Definitions of Functions, Return Values and their Types, Function Calls, Function Declaration, Category of Functions, No Arguments and No Return Values, Arguments with Return Values, No Arguments but Returns a Value, Functions that Return Multiple Values, Nesting of Functions, Recursion, Passing Arrays to Functions, Passing Strings to Function, The Scope, Visibility and Lifetime of Variables, Quick sort and Merge sort.   **(8hrs)**

UNIT IV: Pointers: Understanding Pointers, Accessing the Address of a Variable, Declaring and Initializing of pointers, Accessing a Variable through its Pointer, Pointer Expressions, Pointer Increments and Scale Factor, Pointers and Arrays, Pointers as Function Arguments, Functions Returning Pointers, Pointer to Functions.

Dynamic Memory Allocation: Introduction, Library functions for dynamic memory allocation, Dynamic multi-dimensional arrays, Self Referential Structures. **(10hrs)**

UNIT V: Structures and Unions: Defining a Structure, Declaring Structure Variables, Accessing Structure Members,, Structure Initialization, Copying and Comparing Structure Variables, Operations on Individual Members, Arrays of Structures, Arrays within Structures, Structures Within Structures, Structures and Functions, Unions, Size of Structures, Bit Fields.

File Management in C: Defining File, Opening File, Closing a File, Input /Output Operations on Files, Error Handling During I/O Operations, Command Line Arguments. **(10hrs)**

Text Books:
(i)   E. Balaguruswamy, Progrmming in ANSI C, 7th Edition, Tata McGraw-Hill2017.
(ii)   K R Venugopal& R Prasad: Mastering C,2nd Edition, McGraw-Hill,2017..

Reference Books:
(i)   Richard F G and Behrouz A Forouzan, Data Structures, A pseudocode approach with C, 2nd Edition, CengageLearning.
(ii)   Herbert Schildt, C: The Complete Reference, 4thEdition,McGrawHill,2003.
(iii)   Byron Gottfried, Schaum's Outline of Programming with C, 2nd Edition,McGraw-Hill.
(iv)   YashvantKanetkar: Let us 'C', BPB publications, 10th Education,2010.

e-Books/OnlineResources:
(i)   Introduction to C Programming by ROB Mileshttp://www.control.aau.dk/~jdn/edu/doc/arduino/litt/C%20Programming.pdf
(ii)   C Programming tutorial by Mark Burgershttp://markburgess.org/CTutorial/C-Tut-4.02.pdf
(iii)   http://www.lysator.liu.se/c/bwk-tutor.html#introduction
(iv)   http://www.acm.uiuc.edu/webmonkeys/book/c_guide/

MOOCs:
(i)   http://nptel.ac.in/courses/106105085/4
(ii)   http://www.lynba.com/C-training-tutorials/1249-0.html
(iii)   Ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-087-practical-programming-in-c-january-iap-2010
(iv)   www.cse.iitb.ac.in/~CS101/2011.1/

Course Outcomes: The students at the end of the course, will be able to

CO1: Understand and explore the fundamental Computer Concepts and basic Programming Principles like data types, Operators, input/output functions, Programming constructs and user defined functions

CO2: Develop and analyze algorithmic solutions to problems.

CO3: Design and Implement C Programs in efficient, robust and reusable code.

CO4: Apply appropriate Concepts of data structures like arrays, structures, pointers etc., for various applications.

CO5: Apply programming concepts such as memory allocation/ relinquish, file handling and pointers in implementing the real world computer problems.

Scheme of Examination:

CIE – 50 marks	Test I (Unit I, II &III)- 20 marks	Quiz I – 5 marks	25 Marks	Total:50 marks
	Test II (Unit IV & V) – 20 marks	Quiz II – 5 marks	25 Marks	
SEE – 100 marks	• **Q1 (compulsory):**MCQs or short answer type questions for 15 marks covering entire syllabus.		15 Marks	Total:100 marks
	• **Q3 & Q 6** from Unit-II and Unit-V respectively, shall be answered compulsorily and will not have internal choice.		17 * 2 = 34 Marks	
	• **Q2, Q4and Q5** from Unit-I, Unit-III & Unit-IV respectively, shall have internal choice.		17*3= 51 Marks	

Note: SEE shall be conducted for 100 marks and the marks obtained shall be reduced for 50 Marks.

BANGALORE UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING, UVCE, BENGALURU
Title: PROGRAMMING FOR PROBLEM SOLVING

Course Code	**18ESCS115**				
Category	Engineering Science Courses				
Course title	**Programming for Problem Solving - Practical**				
Scheme and Credits	No. of Hours/Week				Semester – I and II
	L	T	P	SS	Credits	(cycle)
	0	0	3	0	1.5	
CIE Marks: 50	SEE Marks: 50	Total Max. Marks: 100			Duration of SEE: 3 Hrs
Prerequisites (if any): NIL					

Course Objectives:

The students will be able to
1. Apply the specification of syntax rules for numerical constants and variables, data types.
2. Usage of Arithmetic operator, Conditional operator and relational operators and other C constructs.
3. Write C programs using decision making, branching, looping constructs.
4. Apply and Write C programs to implement one dimensional and two dimensional arrays.
5. Writing Programs using strings, structures and pointers.

Practice Session

1. Demonstration of components of a Computer
2. Write a program to find Smallest and largest of three numbers.
3. Evaluate the following expression
   i.   a +b*c/d.
   ii.   (a+b*c)-d ^a
4. Write a program to convert Binary to Decimal and Decimal to Binary.
5. Write a Program to find sum of odd and even numbers from 1 to N.
6. Write a Program to perform string operations using library functions.
7. Write a Program to display a Pascal's triangle.

Lab Programs

Solve the following problems using C Program.
   1) a. Find the roots of quadratic equation.
       b. Find the reverse of an integer and check whether it is a palindrome or not.

   2) a. To generate and print first N Fibonacci numbers using recursion.
       b. Find the GCD of two integers.

   3) a. Compute mean, variance and standard deviation of N real numbers.
       b. Search an element using linear search method.

   4) a. Interchange the largest and smallest number in the array.
       b. Search an element using binary search method.

5) a. To check whether a given string is palindrome or not without library functions
   b. Find the number of vowels, consonants, digits and white spaces in a string.

6) a. Sort N elements of an array in ascending order using bubble sort technique.
   b. Delete an element from an array.

7) Input 2 matrices of size MxN and PxQ. Perform
   a. Multiplication if they are compatible.
   b. Transpose of the resultant matrix. Print the result in matrix form with suitable headings.

8) Read a matrix A (MxN) and to find the following.
   i) Sum of the elements of the row
   ii) Sum of the elements of the column.
   iii) Sum of all the elements of the matrix.
   iv) Sum of both diagonal elements of a matrix.
   Output the computed results with suitable headings.

9) Define a Structure called Employee with Emp ID, Emp-name and Salary as its data members. Read details of N Employees and display the details of employees whose salary is greater than 15000.

10) a. Swap the contents of two variables using pointers.
    b. Concatenate the contents of two files.

11) Create a structure called student with the following members student name, roll-no, marks in three tests. Write a C program to create N records and
    i)   Search on roll-no and display all the records
    ii)   Average marks in each test
    iii)   Highest in each test.

12) a. Store a character string in a block of memory space created by malloc( ) and then modify the same to store a large string.

    b. Reverse the elements of an array using pointers.

Course Outcomes:

The students at the end of the course, will be able to
CO1: Develop programs using concept of decision making statements and arrays.
CO2: Reduce the complexity of the programs by making use of functions.
CO3: Develop and experiment with programs using concepts like pointers, files, structures.

Scheme of Examination:

Continuous Internal Evaluation (Laboratory – 50 Marks)	Marks	Semester End Evaluation(SEE) Laboratory (100 Marks)	Marks
Performance of the student in the laboratory, every week	20	Write up	20
Test at the end of the semester	20	Execution	60
Viva voce	10	Viva voce	20
Total	**50**	**Total**	**100**

Note: SEE shall be conducted for 100 marks for practical & marks obtained shall be reduced for 50 Marks.

Course Code	**18BSEP102**				
Category	Basic Sciences				
Course title	**Engineering Physics – Theory**				
Scheme and Credits	No. of Hours/Week				Semester – I and II (cycle)
	L	T	P	SS	Credits	
	2	2	0	0	3	
CIE Marks: 50	SEE Marks: 50	Total Max. Marks: 100		Duration of SEE: 4 Hrs	
Prerequisites (if any): NIL					

Course Objectives:
1. To make students learn and understand basic concepts and principles of physics to analyze and solve various types of Physical problems.
2. To learn the theory of vibrations and to understand the concept of elasticity.
3. To understand the concept of electrical conductivity in solids and semiconductors.
4. To study the Magnetic and Dielectric properties of Solids.
5. The concept of different phenomenon in optics will be studied.

Unit I: Physics of vibrations: Free oscillations- differential equation and solution; Damped vibrations - differential equation and solution - critical, over and under damping, Forced vibrations - differential equation and solution, Resonance - amplitude and velocity resonance, sharpness of resonance, quality factor, example of forced vibrations - LCR circuits and resonance, problems.
Elasticity: Introduction - Definition of Elastic moduli and Poisson's ratio, Statement of Hook's law, Torsional Pendulum, Bending of Beam - Bending Moment, Cantilever Experiment to determine Young's Modulus, problems. **(11 Hrs)**

Unit II: Electrical Conductivity in Solids: Review of Classical free electron theory-Expression for electrical conductivity in metals, Density of States and Carrier Concentration in Metals. Expressions for thermal conductivity in metals, Wiedemann-Franz law, Limitations of free electron theory.
Introduction to Semiconductors: Intrinsic Semiconductors with examples, Fermi level in intrinsic semiconductors, Expression for energy gap in intrinsic semiconductors, Extrinsic Semiconductors, n-type and p-type semiconductors with examples, charge carrier density in extrinsic semiconductors.
(7 Hrs)
Unit III: Magnetic Materials: Magnetism, Classification of magnetic materials and their properties, Ferrromagnetic materials – concept of domain, B-H curve, Hysteresis loss, Hard and Soft magnetic materials - Properties and applications.
Dielectric Materials: Introduction, Types of polarization, Clausius -Mossotti equation, Ferroelectric Materials- Properties and applications of dielectric materials. **(7 Hrs)**

Unit IV: Interference: Principle of superposition, conditions for interference, Newton rings-condition for bright and dark rings, problems.
Interference in Thin Films: Theory of interference fringes, Determination of the thickness of a thin paper strip using air-wedge, problems.
Diffraction: Definition & condition for Diffraction, two kinds of diffraction, diffraction grating-Determination of wave lengths of mercury spectrum, problems. **(12Hrs)**

Unit V: Lasers: Spontaneous and stimulated emission, population inversion, construction and working of Helium-Neon and semiconducting laser, applications of lasers, problems.

Optical fibres: Mechanism of light transmission in optical fibre, derivation of expression for numerical aperture and acceptance angle, types of optical fibres, loss mechanisms in optical fibres, applications of optical fibres, problems.

Holography: Fundamentals of holography, difference between photography and holography, construction of hologram, recording and reconstruction of three dimensional image, applications of holography. **(10Hrs)**

Text Books:
1. **R K Gaur and S L Gupta**, Engineering Physics, Revised edition 2011.
2. **M N Avadhanulu, P G Kshirasagar,** A Text Book of Engineering Physics, S. Chand Company Private Limited. Revised Edition2015.
3. **Ajay Ghatak**, Optics, McGraw Hill Education (India) Private Limited, 5th Edition,2012.
4. **SPBasavaraju,**   Engineering Physics, Subhas Publications, 1998 & CBCS syllabus,2016.
5. **Srinivasan M R**, Physics for Engineers, New Age International2009.

Reference Books:
1. **Halliday, Resnick& Walker**, Fundamentals of Physics, John Wiley & Sons,2010.
2. **Hitendra K Malik and A K Singh**, Engineering physics, Tata McGrawHill
3. Education private Limited,2009.
4. **Sears and Zemansky**, University Physics with modern physics, 13^{th}Edition, University Press
5. **H D Young and R A Freedman**, University Physics, 13 Edition, Pearson

E-Books/Online Resources:
1. M N Avadhanulu, A Textbook of Engineering Physics,S. Chand Publishing,1992, https://books.google.co.in/books?id=lTUNWOR_cDgC
2. Dattu R Joshi, Engineering Physics, Tata McGraw-Hill Education,2010. https://books.google.co.in/books/about/Engineering_Physics.
3. V Rajendran, Engineering Physics, Tata McGraw-Hill Education,https://books.google.co.in/books/about/Engineering_Physics.html?id=KsXTN UCuby0C
4. Mahesh C Jain, Engineering Physics, PHI Learning Pvt. Ltd., 2009,https://books.google.co.in/books/about/Textbook_Of_Engineering_Physics.html?id=wKeDY bTui PAC&redir_esc=y

MOOCs:
1. http://nptel.ac.in/courses/122107035/
2. http://nptel.ac.in/courses/122103010/(Practicals)

Course Outcomes:
The students at the end of the course will be able to:

CO1: Understand the concept of theory of vibrations which helps to set up and solve differential equations related to the situation and the knowledge of elasticity that can be applied in different branches of Engineering.

CO2: The importance of free electrons in determining the properties of metals, to understand the concept of fermi energy useful in analyzing the structure of solids. The knowledge of semiconductor scan be implemented in many day to day applications.

CO3: The mechanical properties of the materials will be understood by learning the concept of magnetic and dielectric properties using which strength of the materials can be analyzed.

CO4: The importance of the Physics of Optics is significant in various fields of Science &Technology.

Scheme of Examination:

CIE – 50 marks	Test I (Unit I, II &III)- 20 marks	Quiz I – 5 marks	25 Marks	Total:50 marks
	Test II (Unit IV & V) – 20 marks	Quiz II – 5 marks	25 Marks	
SEE – 100 marks	• **Q1 (compulsory):** MCQs or short answer type questions for 15 marks covering entire syllabus.		15 Marks	Total:100 marks
	• **Q2 & Q 3** from Unit-II and Unit-III respectively, shall be answered compulsorily and will not have internal choice.		17 * 2 = 34 Marks	
	• **Q4, Q5 and Q6** from Unit-I, Unit-IV & Unit-V respectively, shall have internal choice.		17*3= 51 Marks	

Note: SEE shall be conducted for 100 marks. The marks obtained shall be reduced for 50 Marks.

BANGALORE UNIVERSITY
DEPARTMENT OF PHYSICS, BENGALURU
Title: ENGINEERINGPHYSICS

Course Code	**18BSEP103**				
Category	Basic Sciences				
Course title	**Engineering Physics –Practical**				
Scheme and Credits	No. of Hours/Week				Semester – I and II (cycle)
	L	T	P	SS	Credits	
	0	0	3	0	1.5	
CIE Marks: 50	SEE Marks: 50	Total Max. Marks: 100			Duration of SEE:3 Hrs
Prerequisites (if any): NIL					

Course Objectives:
1. To conduct experiments for determining mechanical, material and electrical properties.
2. To conduct experiments for determining typical parameters of optics.
3. To develop skills in handling precision devices and equipments.

List of Laboratory Experiments
1. Study of frequency response in series and parallel LCR circuits and quality factor.
2. Determination of frequency of tuning fork using volume resonator.
3. Determination of Young's Modulus of the material using single cantilever.
4. Determination of rigidity modulus of the given wire by torsional oscillations method.
5. Determination of electrical conductivity of a semiconductor using four probe method.
6. Measurement of energy gap of a semiconductor.
7. Determination of dielectric constant of the material by charging and discharging of the capacitor.
8. Study of B-H Curve in ferrites/soft iron using CRO.
9. Measurement of wavelength of mercury spectrum using diffraction grating.
10. Measurement of radius of curvature of a lens by Newton's rings method.
11. Determination of thickness of a paper strip using gair-wedge.
12. Estimation of numerical aperture and attenuation coefficient of an optical fibre.

Note:
1. Each student has to perform10 experiments in a semester.

E-B ooks/Online Resources:
1. https://www.bvrit.ac.in/Freshman_Lab_Manuals/freshman_enginering_physics/Engineering%20Physics.pdf
2. Engineering Physics Lab http://www.aurora.ac.in/images/pdf/departments/humanities-and-sciences/engg-phy-lab-manual.pdf

Course Outcomes:
CO1: They will be knowing the principle behind determining experimentally the physical and electrical properties of few materials.
CO2: They will be knowing the principle behind determining parameters of optics in engineering
CO3: They will develop confidence and skills in handling equipment.
CO4: They will be in a position to describe the principles and theory on which the experiment is based on.

Scheme of Examination:

Continuous Internal Evaluation (Laboratory – 50 Marks)	Marks	Semester End Evaluation(SEE) Laboratory (100 Marks)	Marks
Performance of the student in the laboratory, every week	20	Write up	20
Test at the end of the semester	20	Experiments	60
Viva voce	10	Viva voce	20
Total	**50**	**Total**	**100**

Note: SEE shall be conducted for 100 marks for practical and the marks obtained shall be reduced for 50 Marks.

Course Code	**18BSCH110**				
Category	Basic Sciences				
Course title	**Engineering Chemistry- Theory**				
Scheme and Credits	No. of Hours/Week				Semester – I and II (cycle)
	L	T	P	SS	Credits	
	2	2	0	0	3	
CIE Marks: 50	SEE Marks: 50	Total Max. Marks: 100			Duration of SEE:3 Hrs
Prerequisites (if any): NIL					

Course Objectives:

1. To provide basic principles and various aspects of atomic, molecular orbitals: their applications.
2. To expose the students to understand the theory and prevention of electroplating/electroless plating in various industries and to study green chemistry protocols.
3. To study the construction, uses of modern day batteries.
4. To enable the students to learn preparation and applications of polymers and conducting polymers.
5. To provide the factors and control of corrosion.

Unit I : Atomic and molecular structure
Molecular orbitals of diatomic molecules and plots of the multicenter orbitals. Equations for atomic and molecular orbitals. Energy level diagrams of diatomic molecules.
Bonding in solids: Ionic, covalent, metallic and molecular solids.
Band theory of solids – Molecular orbital theory, linear combination of atomic orbitals, bonding and antibonding orbitals with hydrogen as example. Extension of band theory to metals, semiconductors and insulators. Semiconductors- Intrinsic and extrinsic – p and n-types, stoicheometric semiconducting compounds,numerical problems.   **(9hrs)**

Unit II: Metal finishing
Technological importance. Effect of plating variables on electrodeposits. Electroplating techniques – methods of electroplating, surface preparation, plating of Cr. Electroless plating of copper for PCB
                                                                                              (3 hrs)
Organic reactions and synthesis
Introduction to reactions involving substitution, addition, elimination, oxidation, reduction, cyclization and ring-opening reactions. Green chemistry principles (12 principles) Atom economy: concept, AE in oxidation of benzene and butadiene. Microwave irradiation in organic synthesis: concept, advantages, synthesis of esters, oxidation reactions, amination of ketones; Bio-catalysis: Concept, advantages, synthesis of6-aminopenicillanicacid.   (**6hrs**)

Unit III: **Use of free energy in chemical equilibria**
Thermodynamic functions: energy, entropy and free energy. Free energy and emf. Cell potentials, the Nernst equation and applications.

Battery technology: Introduction, basic concepts- Principal component of battery, classification, cell reactions and performance of primary battery – $Zn-MnO_2$, secondary batteries – working principle, cell reactions and performance of Pb-acid battery, Ni-Cd battery. Fuel cells – Definition, classification and advantages and limitations. Construction and cell reactions of H_2-O_2 fuel cell and methanol-oxygen fuel cell. Numerical problems.   **(9 hrs)**

Unit IV: Stereochemistry
Representations of 3 dimensional structures, structural isomers and stereoisomers, configurations and symmetry, chirality, enantiomers, diastereomers, optical activity. Conformations in cyclohexanes (disbustituted only). Structures of different molecules.   **(3   hrs)**
Polymers
Definitions – Natural and synthetics polymers, mechanism of addition polymerization (free radical mechanism), – manufacture, properties and applications of HDPE and LDPE, polystyrene, phenol-formaldehyde, Teflon, poly methyl methacrylates, polyurethanes and polycarbonatesS. Elastomers: Synthesis, properties and uses of elastomers (synthetic rubbers) – Buna S and neoprene.
Conducting polymers Definition, examples-PA, PPP, PPy difference between conducting polymers and conventional conductors. Reactions of all the preparations.   **(6 hrs)**

Unit V: Periodicproperties
Effective nuclear charge, penetration of orbitals, variations of s, p, d and f orbital energies of atoms in the periodic table, electronic configurations, atomic and ionic sizes, ionization energies, electron affinity and electronegativity, polarizability, oxidation states, coordination numbers and geometries, hard and soft acids and bases,molecular geometries.   **(4   hrs)**
Corrosion engineering
Metallic corrosion- definition, electrochemical theory of corrosion. Forms of corrosion, stress corrosion. Factors affecting the rate of corrosion. Corrosion control surface coatings, inorganic coatings – phosphating, anodizing, organic coatings – paints and enamels. Metal coatings – anodic metal coatings – galvanizing. Cathodic metal coatings – tinning. Corrosion inhibitors. Cathodic and anodic protection.   **(5 hrs)**

Text Books
1.   Engineering Chemistry by R. Gopalan, D. Venkappayya and Nagarajan, Vikas Publishing House Pvt. Ltd.1999.
2.   Chemistry for Engineering Students by Dr. B. S. Jai Prakash, Dr. Shivakumaraiah,Prof. R. Venugopal and Dr. PushpaIyengar.
3.   Engineering Chemistry by Jain and Jain.

REFERENCE BOOKS
4.   Solid State Chemistry and its applications by A.R. West, John Wiley,1987.
5.   Chemistry in Engineering and Technology Vol.1 and Vol.2 by J. C. Kuriacoseand J. Rajaram, Tata McGraw – Hill Publishing Company Ltd.
6.   Chemistry of advanced materials by C.N. R. Rao, Blackwell ScientificPublications,1993.
7.   Solid state chemistry compounds by A. K. Cheethanand P. Day, Clarendon press, Oxford,1992.
8.   An introduction to electrochemistry by Glasstone, East-West PressPvt.Ltd.,1985
9.   Chemical and electrochemical energy systems by R. Narayan and B. Viswanathan, University press,1998.
10.   Text book of polymer science by F. W. Billmeyer, Jr., John Wiley and Sons1994.
11.   Green Chemistry An Introductory Text by Mike Lancaster, Royal Society of Chemistry, 2002.
12.   Green Chemistry Environment Friendly Alternatives by Rashmi Sanghi and M.M. Srivastava, Narosa Publishing House,2003.

Online Resources

1. http://nptel.ac.in/
2. www.smartzworld.com
3. http://www.tndte.gov.in/
4. https://pubs.acs.org/doi/abs/10.1021/ie50456a005
5. https://www.pdfdrive.net/polymer-science-and-engineering-e397082.html
6. https://www.mooc-list.com/tags/mechanical-engineering

Course Outcome:

The students at the end of the course will be able to

CO1: Understand the basic principles and various aspects diatomic molecules and band theory of solids.

CO2: Learn the various methods of metal finishing and green chemistry reactions.

CO3: Acquire the knowledge of the applications of batteries.

CO4: Learn the preparation and applications of polymers and conducting polymers.

CO5: Have the chemical knowledge of the control of corrosion.

Scheme of Examination:

CIE – 50 marks	Test I (Unit I, II &III)- 20 marks	Quiz I – 5 marks	25 Marks	Total:50 marks
	Test II (Unit IV & V) – 20 marks	Quiz II – 5 marks	25 Marks	
SEE – 100 marks	• **Q1 (compulsory):** MCQs or short answer type questions for 15 marks covering entire syllabus.		15 Marks	Total:100 marks
	• **Q2 & Q 3** from Unit-II and Unit-III respectively, shall be answered compulsorily and will not have internal choice.		$17 * 2 = 34$ Marks	
	• **Q4, Q5 and Q6** from Unit-I, Unit-IV & Unit-V respectively, shall have internal choice.		$17*3= 51$ Marks	

Note: SEE shall be conducted for 100 marks. The marks obtained shall be reduced for 50 Marks

Course Code	**18BSCH111**				
Category	Basic Sciences				
Course title	**Engineering Chemistry- Practical**				
Scheme and Credits	No. of Hours/Week				Semester – I and II (cycle)
	L	T	P	SS	Credits	
	0	0	3	0	1.5	
CIE Marks: 50	SEE Marks: 50	Total Max. Marks: 100			Duration of SEE:3 Hrs
Prerequisites (if any): NIL					

Course Objectives
1. To expose the students to learn the preparation of standard solutions.
2. To study the estimations of constituents in live samples like hard water, waste water, cement solution, brass etc.
3. To enable the students to learn the latest method for determination of metals, metal ions at very low concentration in the samples using sophisticated instruments.

PART- A
1. Preparation of standard EDTA solution and determination of total hardness of water.
2. Preparation of standard EDTA solution and determination of calcium oxide in the given sample of cement solution (rapid EDTA method)
3. Determination of Cu% in brass using standard sodium thiosulphate solution.(brass solution to be prepared by weighing the brass sample)
4. Preparation of standard dichromate solution and determination of iron in the given sample solution of haematite ore (external indicator method)
5. Determination of manganous dioxide in the pyrolusite using potassium permanganate solution (pyrolusiteis to be weighed)
6. Determination of chemical oxygen demand of the given industrial waste water sample.
7. Estimation of Ca^{2+} ions in the solution of dolomite.

Part – B
1. Determination of pKa value of a week acid using pH meter.
2. Colorimetric determination of iron/copper/any other metal.
3. Estimation of hydrochloric acid using standard sodium hydroxide solution conductometrically.
4. Determination of coefficient of viscosity of a given liquid using Ostwald's viscometer (density of the liquid is to be given)
5. Kinetics of acid hydrolysis of methylacetate.

Part – C
1. Demonstration of chemistry software – Viscosity experiment, demonstration of IR spectroscopy.
2. Demonstration of gravimetric estimation of nickel using dimethylglyoxime.
3. Demonstration of synthesis organic compound using microwave irradiation (synthesis of asprin, glucose pentaacetate, oxidation and reduction reactions).

Text Books
13. Engineering Chemistry by R. Gopalan, D. Venkappayya and Nagarajan, Vikas Publishing House Pvt. Ltd.1999.
14. Chemistry for Engineering Students by Dr. B. S. Jai Prakash, Dr. Shivakumaraiah, Prof. R. Venugopal and Dr. Pushpa Iyengar.
15. Engineering Chemistry by Jain and Jain.

Course Outcome
The students at the end of the course will be able to:
CO1: Learn the preparation of standard solutions.
CO2: Estimate the constituents in live samples like hard water, waste water, cement solution, brass etc.
CO3: Understand the latest method for determination of metals, metal ions at very low concentration in the samples using sophisticated instruments.

Scheme of Examination:

For examination an experiment each from Part-A and Part-B shall be set. Under part-A, a common experiment shall be set for all the candidates while under part-B, different experiment may be set.

Continuous Internal Evaluation (Laboratory – 50 Marks)	Marks	Semester End Evaluation(SEE) Laboratory (100 Marks)	Marks
Performance of the student in the laboratory, every week	20	Write up	20
Test at the end of the semester	20	Experiments	60
Viva voce	10	Viva voce	20
Total	**50**	**Total**	**100**

Note: SEE shall be conducted for 100 marks for practical and the marks obtained shall be reduced for 50 Marks.

BANGALORE UNIVERSITY
DEPARTMENT OF MATHEMATICS, BANGALORE UNIVERSITY, BENGALURU
Title: ENGINEERING MATHEMATICS-I

Course Code	**18BSEM101**				
Category	Basic Sciences				
Course title	**Engineering Mathematics-I (Common to all branches)**				
Scheme and Credits	No. of Hours/Week				Semester – I and II (cycle)
	L	T	P	SS	Credits	
	2	2	0	0	3	
CIE Marks: 50	SEE Marks: 50	Total Max. Marks: 100			Duration of SEE:3 Hrs
Prerequisites (if any): NIL					

Course Objectives:

This course will enable all students to:
1. Develop a thorough knowledge and deep understanding of definite and indefinite integrals, beta and gamma functions and their applications.
2. Study applications of Rolls and Mean value theorems and also concept of maxima & minima.
3. Be skilled in computations and applications of infinite series and sums and analyze a nature of the given series.
4. Be able to solve the linear algebraic equations and compute eigenvalues and eigenvectors.
5. Apply the concept of partial differentiation; determine Jacobians, gradient, curl and divergence of the problems which appear in engineering problems.

SYLLABUS
Unit I:
Calculus-I: Evaluation of definite and improper integrals, Beta and Gamma functions and their properties; Applications of definite integrals to evaluate surface areas and volumes of revolution

(6 hrs)

Unit II:
Calculus-II: Rolle's theorem, Mean value theorem, Taylor's theorems with remainders; Maxima and minima with problems. **(6 hrs)**

Unit III:
Sequence and series: Convergence of sequence and series, tests for convergence- ratio test, Raabe's test, Cauchy's test, root test, integral test; absolute and conditional convergence; Leibnitz's test; Summation of binomial, exponential and logarithmic series; Power series, Taylor's series, series for exponential, trigonometric and logarithmic functions. **(11hrs)**

Unit IV:
Matrices: Consistency of system of equations-homogeneous, non-homogeneous, rank of a matrix; Inverse and rank of a matrix, orthogonal matrices; eigenvalues and eigenvectors of the matrix; Cayley-Hamilton theorem; Diagonolisation of square matrices. **(11hrs)**

Unit V:
Multivariable calculus (Differentiation): Partial derivatives-Euler's theorem (without proof) and problems; total and implicit derivatives; evaluation of Jacobians; Method of Lagrange multipliers; Gradient, curl and divergence-problems. **(11hrs)**

Text Books
1. B. S. Grewal, "Higher Engineering Mathematics", Khanna publishers, 42nd edition,2013.
2. E. Kreyszig, "Advanced Engineering Mathematics" - Wiley,2013.
3. D. S. Chandrashekaraiah, "Engineering Mathematics-I", Prism Books Pvt. Ltd. 7th Edition, 2014.

Reference Books:
1. B.V. Ramana "Higher Engineering Mathematics" Tata Mc Graw-Hill,2006
2. N P Bali and M. Goyal, "A text book of Engineering mathematics", Laxmi publications, latest edition.
3. H. K Dassand Er. RajnishVerma, "Higher Engineering Mathematics", S. Chand publishing, 1st edition,2011.

E-B ooks:
1. http://tutorial.math.lamar.edu/Classes/CalcII/CalcII.aspx
2. http://www.ec.unipg.it/DEFS/upload.linalg_evals_evects.pdf
3. https://www.math.ku.edu/~lerner/LAnotes?LAnotes.pdf
4. https://ocu.mit.edu/courses/mathematics/18-06-linear-algebra-spring-2010/vidoe-lectures/(Gilbert Strangvediolectures)
5. http://nptel.ac.in/downloads/122101003(lecturenotes)

MOOC/NPTEL
1. http://nptel.ac.in
2. http://academicearth.org/

Course outcomes: On completion of this course, students are able to:
CO1: Use definite and indefinite integrals, beta and gamma functions appearing in engineering applications.
CO2: Solve problems of Rolls and Means value theorems, of maxima and minima.
CO3: Compute infinite series, sum an infinite series, analyze a nature of the given series.
CO4: Solve linear algebraic equations, compute eigenvalues and eigenvectors and diogonalize the square matrix.

Scheme of examination

CIE – 50 marks	Test I (Unit I, II &III)- 20 marks	Quiz I – 5 marks	25 Marks	Total:50 Marks
	Test II (Unit IV & V) – 20 marks	Quiz II – 5 marks	25 Marks	
SEE – 100 marks	**Q1 (compulsory):** MCQs type questions for 15 marks covering entire syllabus.		50 Marks	Total:100 Marks
	Q2 & Q3 from Unit I and Unit II. Respectively, shall be answered compulsorily and will not have internal choice.		17 * 2 =34 Marks	
	Q4,Q5 & Q6 from Unit III, Unit IV and Unit V respectively, shall have internal choice.		17*3=51 Marks	

BANGALORE UNIVERSITY
DEPARTMENT OF MATHEMATICS, BANGALORE UNIVERSITY, BENGALURU
Title: ENGINEERING MATHEMATICS-II

Course Code	**18BSEM201**				
Category	Basic Sciences				
Course title	**Engineering Mathematics-II (Common to all branches)**				
Scheme and Credits	No. of Hours/Week				Semester – I and II (cycle)
	L	T	P	SS	Credits	
	2	2	0	0	3	
CIE Marks: 50	SEE Marks: 50	Total Max. Marks: 100		Duration of SEE:3 Hrs	
Prerequisites (if any): NIL					

Course objectives:

This course will enable all students to:
1. Understand the concept of direction cosines and ratios, planes, etc and also find the angle between straight lines and planes.
2. Be able to solve analytically all sorts of first order ordinary differential equations which often appear in engineering applications.
3. Develop analytical technique to solve various higher order differential equations of the type constant and variable coefficients, and both homogenous and non-homogeneous.
4. Analyze the Laplace transforms for various standard functions, periodic functions, compute inverse Laplace transform and solve the differential equations.
5. Understand the double and triple integral concepts, change order of integrations, variables and solve problems involving cubes, sphere and vector integrals.

Unit I:
Analytical Geometry: Direction cosines and direction ratios, planes, straight lines, angle between planes and angle between straight lines, coplanar lines, shortest distance between skew lines, right circular cone and right circular cylinder. **(6 hrs)**

Unit II:
First order ordinary differential equations: Variable separable method, Homogeneous forms, linear, Bernoulli's equations, Exact equations, Reducible equations to exact equations, Euler's equations; Orthogonal trajectories- Cartesian and polar forms. **(6 hrs)**

Unit III:
Ordinary differential equations of higher orders: Second and higher order differential equations, homogeneous linear equations with constant and variable coefficients, non- homogeneous linear equations with constant and variable coefficients- problems, method of variation of parameters, method of undetermined coefficients. **(10 hrs)**

Unit IV:
Laplace Transform: Definition and Laplace transforms of elementary functions. Laplace transforms of   ,   ,(~~without~~ proof), periodic functions and unit-step function-problems.

Inverse Laplace Transform-problems, Convolution theorem to find the inverse Laplace transforms(without proof) and problems, solution of linear differential equations using Laplace Transforms. **(12 hrs)**

Unit V:
Multivariable calculus (Integration): Multiple Integration: Double integrals(Cartesian), change of order of integration in double integrals, Change of variables(Cartesian to polar), Applications: areas and volumes; Triple integrals(Cartesian), orthogonal curvilinear coordinates, simple applications involving cubes, sphere and rectangular parallelopipeds; line and surface integrals, vector surface integrals, theorems of Green, Gauss and Stokes. **(12 hrs)**

Text Books
1. B. S. Grewal," Higher Engineering Mathematics", Khanna publishers, 42nd edition,2013.
2. E. Kreyszig, "Advanced Engineering Mathematics" - Wiley,2013.
3. D. S. Chandrashekaraiah, "Engineering Mathematics- II", Prism Books Pvt. Ltd. 7th Ed, 2014.

Reference Books:
1. B.V. Ramana "Higher Engineering Mathematics" Tata Mc Graw-Hill,2006
2. N P Bali and M. Goyal, "A text book of Engineering mathematics", Laxmi publications.
3. H. K Dassand Er. RajnishVerma, "Higher Engineering Mathematics", 1st edition,2011.

E-B ooks:
1. http://tutorial.math.lamar.edu/Classes/CalcII/CalcII.aspx
2. http://www.ec.unipg.it/DEFS/upload.linalg_evals_evects.pdf
3. https://www.math.ku.edu/~lerner/LAnotes?LAnotes.pdf
4. https://ocu.mit.edu/courses/mathematics/18-06-linear-algebra-spring-2010/vidoe-lectures/(Gilbert Strangvediolectures)
5. http://nptel.ac.in/downloads/122101003(lecturenotes)

MOOC/NPTEL
1. http://nptel.ac.in
2. http://academicearth.org/

Course outcomes:
On completion of this course, students are able to:
CO1: Calculate the direction cosines and ratios, planes, etc and also find the angle between straight lines and planes.
CO2: Solve analytically all sorts of first order linear and nonlinear differential equations.
CO3: Solve higher order differential equations with constant and variable coefficients and also homogeneous and non-homogeneous differential equations.
CO4: Compute the Laplace transforms of standard functions, periodic function. compute inverse Laplace transform and solve the differential equations.
CO5: Evaluate the double and triple integral, change order of integrations and variables.

Scheme of examination

CIE – 50 marks	Test I (Unit I, II &III)- 20 marks	Quiz I – 5 marks	25 Marks	Total:50 Marks
	Test II (Unit IV & V) – 20 marks	Quiz II – 5 marks	25 Marks	
SEE – 100 marks	**Q1 (compulsory):** MCQs type questions for 15 marks covering entire syllabus.		50 Marks	Total:100 Marks
	Q2 & Q3 from Unit I and Unit II. Respectively, shall be answered compulsorily and will not have internal choice.		17 * 2 =34 Marks	
	Q4,Q5 & Q6 from Unit III, Unit IV and Unit V respectively, shall have internal choice.		17*3=51 Marks	

Bangalore University
University Visvesvaraya College of Engineering
Semester I/II B.Tech. – CBCS
Title: Professional English

Course Code	**18HSPE108**				
Category	Humanities				
Course title	**Professional English**				
Scheme and Credits	No. of Hours/Week				Semester – I and II (cycle)
	L	T	P	SS	Credits	
	2	0	2	0	3	
CIE Marks: 50	SEE Marks: 50	Total Max. Marks: 100		Duration of SEE: 3Hrs	
Prerequisites (if any): NIL					

Course Objectives: To enable students to learn
1. Communication skills
2. Listening and Speaking skills
3. Reading skills
4. Language skills – Grammar and Vocabulary
5. Writing skills

Unit I: Communication Skills
1. Importance of communication and its process
2. Types of communication – verbal and non verbal, intrapersonal and interpersonal, formal and informal, mass and organizational, general and technical.
3. Channels of communication – written media, oral media and electronic media
4. Barriers to communication – semantic, interpersonal, organizational, cross-cultural, intrapersonal and physical
5. Greeting, introducing and making requests
6. Asking for and giving permission /directions and offering help

Unit II:
a) Listening Skills
1. Importance of listening in communication
2. Listening distinguished from learning
3. Types of listening – Ignoring, selective listening to recall specific information, attentive listening to comprehend a lecture, empathetic listening, critical listening and creative listening
4. Techniques to hone listening skills and practice exercises for listening and phonetics.

b) Speaking Skills
1. Telephone conversations
2. Lectures or presentation using visual aids or power point to present a product or a user manual.
3. A short speech on any topic
4. Job interviews
5. Group discussion

Unit III: Reading Skills
1. Skimming and scanning as techniques in reading comprehension
2. Ways of reading – Extensive reading for pleasure, intensive reading for factual information and interactive reading on the screen.

3. Reading for local and global comprehension.
4. Reading to summarize.
5. Reading to interpret visual data such as graphs, tables, flow-charts and maps.

Unit IV: Language Skills
a) Grammar
1. Present tense, Past tense and the future tense
2. Question tags
3. Prepositions
4. Articles
5. Conjunctions
6. Subject- verb agreement
7. Reported speech
8. Active and passive voice
9. Common errors
10. Modal verbs

b) Vocabulary
1. Idiomatic expressions
2. Prefixes and suffixes, synonyms and antonyms
3. One-word substitutes
4. Words often confused
5. Linking words or cohesive devices
6. Business and job-related vocabulary

Unit V: Writing Skills
1. Email
2. Paragraph writing- narrative, cause –effect, comparative and descriptive
3. Letter writing – Letters of enquiry and complaint.
4. Resume and cover letter
5. Essay writing - types of essays – narrative, descriptive, expository and argumentative
6. Report writing
7. Punctuation

Textbook
1. Sudharshana N P and C Savitha
   English for Technical Communication, New Delhi, Cambridge University Press India Pvt.
   Ltd., -2016

Reference books:
2. Subhashini - English And Communication Skills
   Bangalore, Innovative publishers revised edition –2018.
3. English Language and Communication Skills –Lab Manual CumWorkbook
   Delhi, Cengage Learning India Pvt., Ltd.,2014.
4. Seely, John, Oxford Guide to Effective Writing and Speaking,
   New Delhi, Oxford University Press, 1998,2005, 2012.
5. Krishnaswamy N , ManjuDhariwal and LalithaKrishanswamy,
   Mastering Communication Skills and Soft Skills – Learner's Guide to Life Skills, New Delhi,
   Bloomsbury, 2015.
6. TyagiKavitha and PadmaMisra,
   Basic Technical Communication, New Delhi, PHI Learning Private Limited- 2011.

Course Outcomes:

The students at the end of the course will be able to:

CO1: Describe and learn communication skills.

CO2: Apply listening techniques to comprehend spoken English in various accents and apply English speaking skills in various contextual scenarios.

CO3: Apply reading techniques to comprehend passages and answer questions related to them and interpret factual information and summarize passages.

CO4: Practise grammar exercises and master vocabulary.

CO5: Demonstrate techniques to compose and edit messages for a given context with proper vocabulary and punctuation.

Scheme of examination

<table>
<tr>
<td rowspan="2">(i) CIE – 50 marks</td>
<td>Test I (Unit I,II & III) -20 Marks</td>
<td rowspan="2">Quiz I - 5 marks
Quiz II - 5 marks</td>
</tr>
<tr>
<td>Test II (Unit IV & V) -20 Marks</td>
</tr>
<tr>
<td>(ii) SEE – 100 marks (to be reduced to 50 marks)</td>
<td colspan="2">The question paper consists of 5 Units: Communication, listening and speaking, reading, grammar and vocabulary and writing.
i.   Answer questions from all the 5Units.
ii.   Questions Q1 and Q2 on Unit I & II respectively, carry internalchoice.
iii.   Questions Q3, Q4 and Q5 on Unit III, IV, V respectively, are compulsory with no internalchoice.
Q3: 1. Reading comprehension passage questions
     2. Summarize a passage.
Q4: 1. Grammar questions
     2. Vocabulary questions.
Q5: 1. Paragraph writing
     2. Letter/CV writing.</td>
</tr>
</table>

Bangalore University
University Visvesvaraya College of Engineering
Semester I/II B. Tech. - CBCS
Title: ಕನ್ನಡ

Course Code	**18MCK N116**				
Category	Humanities				
Course title	Kannada				
Scheme and Credits	No. of Hours/Week				
	L	T	P	SS	Credits	Semester – I and II (cycle)
	1	0	0	0	1	
CIE Marks: 50			Total Marks: 50		
Pre-requisites (if any): Nil					

Part - A (For students knowing Kannada)
ಕನ್ನಡ

ಭಾಗ –1

(ಕಥೆ / ಕವನ)

1. ಬೆಡ್ ನಂಬರ್ ಏಳು   – ತ್ರಿವೇಣಿ

2. ಗಾಂಧಿ   – ಡಾ. ಬೆಸಗರಹಳ್ಳಿ ರಾಮಣ್ಣ

3. ಶ್ರಾವಣ   – ದ. ರಾ. ಬೇಂದ್ರೆ

4. ರೊಟ್ಟಿ ಮತ್ತು ಕೋವಿ   – ಸು. ರಂ. ಎಕ್ಕುಂಡಿ

5. ಎಲ್ಲ ಹುಡುಗಿಯರ ಕನಸು   – ಸವಿತಾ ನಾಗಭೂಷಣ

6. ಬೆಳ್ಳಿಯ ಹಾಡು   – ಡಾ. ಸಿದ್ದಲಿಂಗಯ್ಯ

ಭಾಗ –2

(ಸಂಸ್ಕೃತಿ/ ಪ್ರವಾಸ ಕಥನ/ ಅಂಕಣ ಬರಹ/ ವಿನೋದ)

1. ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿ ಒಂದು ಚಿತ್ರ   –ರಹಮತ್ ತರೀಕೆರೆ

2. ಶಾಸನಗಳಲ್ಲಿ ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿ   –ಡಾ. ವಿ. ಜಯರಾಮ್
                                         (ಬಹುಮುಖಿ ಕೃತಿಯಿಂದ)

3. ದೋಣಿ ಹರಿಗೋಲುಗಳಲ್ಲಿ   –ಡಾ. ಕೆ. ಶಿವರಾಮ ಕಾರಂತ

4. ಗುಬ್ಬಿಯ ಗೂಡು   –ಪಿ. ಲಂಕೇಶ್

5. ನಮ್ಮ ಎಮ್ಮೆಗೆ ಮಾತು ತಿಳಿಯುವುದೇ?   –ಗೊರೂರು ರಾಮಸ್ವಾಮಿ ಅಯ್ಯಂಗಾರ್

ಭಾಗ –3

(ವ್ಯಕ್ತಿ ಚಿತ್ರ/ ಪ್ರಬಂಧ/ ಪರಿಸರ ಲೇಖನ)

1. ಡಾ. ಸರ್. ಎಂ. ವಿಶ್ವೇಶ್ವರಯ್ಯ   –ಡಾ. ಎ.ಎನ್. ಮೂರ್ತಿರಾವ್

2. ಅಣ್ಣಪ್ಪನ ರೇಷ್ಮೆ ಕಾಯಿಲೆ   –ಕುವೆಂಪು

3. ವೃತ್ತಿ ಶಿಕ್ಷಣದಲ್ಲಿ ಕನ್ನಡ ಮಾಧ್ಯಮ   –ಎಸ್. ಸುಂದರ್

4. ಚೆಂಕ್ರ ಮೇಸ್ತ್ರೀ ಮತ್ತು ಅರಿಸ್ಟಾಟಲ್   –ಕೆ.ಪಿ. ಪೂರ್ಣಚಂದ್ರ ತೇಜಸ್ವಿ

ಪಠ್ಯ ಪುಸ್ತಕ:

1. ಕನ್ನಡ ಮನಸು, ಪ್ರಸರಾಂಗ, ಕನ್ನಡ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಹಂಪಿ

ಪಾರಮಾರ್ಶನ ಗ್ರಂಥಗಳು:

1. ಗ್ರಾಮಾಯಣ   –ರಾವ್ ಬಹುದ್ದೂರ್
2. ಕಾನೂರು ಹೆಗ್ಗಡತಿ   –ಕುವೆಂಪು
3. ನಮ್ಮ ಹೊಟ್ಟೆಯಲ್ಲಿ ದಕ್ಷಿಣ ಅಮೇರಿಕಾ   –ಬಿ.ಜಿ.ಎಲ್. ಸ್ವಾಮಿ
4. ಬಹುಮುಖಿ   –ಡಾ. ವಿ. ಜಯರಾಮ್

Part - B (For students not knowing Kannada)
KANNADA KALI

UNIT - I

Lesson-1: Introducing each other-1. Personal Pronouns, Possessive forms, Interrogative forms.

Lesson-2: Introducing each other-2. 1. Personal Pronouns, Possessive forms, Yes/No type, Interrogation.

Lesson-3: Absolute Ramayana. Possessive forms of nouns, dubietive question, relative nouns.

Lesson-4: Enquiring about a room for rent, Qualitative and Quantitative adjectives.

Lesson-5: Enquiring about the college, Predicative forms, locative case.

Lesson-6: In hotel-dative case defective verbs.

Lesson-7: Vegetable market, Numeral, Plurals.

UNIT - II

Lesson-8: Planning for a picnic, Imperative, Permissive, hortative.

Lesson-9: Conversation between doctor and patient. Verb-iru, negation-illa, non-past tense.

Lesson-10: Doctor's advice to patient, potential forms, no-past continuous.

Lesson-11: Discussing about a film, past tense, negation.

Lesson-12: About Brindavan Garden, Past tense, negation.

Lesson-13: About routine activities of a student, verbal principle, reflexive form, negation.

Lesson-14: Telephone conversation, past and present perfect, past continuous and their negation.

Lesson-15: About Halebid, Belur, relative, principle, Negation.

Lesson 16: Discussing about examination and future plan, simple conditional and negative.

UNIT - III

Lesson-17: Karnataka (Lesson for reading)

Lesson-18: Kannada Bhaashe (Lesson for reading)

Lesson-19: Manataruva Sangatialla (Lesson for reading)

Lesson-20: Beku Bedagalu (Lesson for reading)

REFERENCE BOOKS:
1. Kannada Kali -Dr. Lingadevaru Halemane
2. Kannada Paatagalu- Editor: Dr. Chandrashekara Kambara.

Scheme of examination:

Students have to answer either Part A or Part B

(i) CIE - 50 marks	Test I -20 Marks	**Quiz I** - 5 marks
	Test II - 20 Marks	**Quiz II** - 5 marks