COURSE STRUCTURE
AND
DETAILED SYLLABUS
R18 UG

DEPARTMENT OF

ELECTRONICS AND COMMUNICATION ENGINEERING

COLLEGE VISION

KSRMCE seeks to be recognized as one of the best engineering colleges in India in providing high standards of academics with most productive, creative learning environment by including research, Innovation thoughts and producing graduates with human values & leadership qualities to serve nation.

COLLEGE MISSION

M1: To provide high quality education in Engineering & Technology in order to bring out knowledgeable engineers.
M2: To creative environment a collaborative environment with stakeholders to take up need-based research and industry specific programs.

M3: To organize co-curricular and extracurricular activities for character and personality development to produce highly competent and motivated engineers and professionals to serve and lead the society.

DEPARTMENT VISION

To emerge the Electronics and Communication Engineering Department as a value based globally recognized centre ensuring academic excellence, fostering research innovation and entrepreneurial attitude.

DEPARTMENT MISSION

M1: To be a student centric institute imbibing experiential, innovative and lifelong learning skills, addressing industrial and societal problems.

M2: To promote all-inclusive research and development.

M3: To inculcate entrepreneurial attitude and values amongst the learners.

M4: To strengthen National and International, Industrial and Institutional collaborations for symbiotic relations.

PROGRAM EDUCATIONAL OBJECTIVES

PEO1: To provide students with a strong foundation in mathematics, science and engineering.

PEO2: To provide students with sufficient technical and programming skills to meet the industry demands.

PEO3: To provide students with sufficient leadership, entrepreneurship qualities, professional and ethical attitude for a successful professional career.

PEO4: To generate graduates with a multidisciplinary approach and an ability to relate engineering issues to broader social context.

PROGRAM OUTCOMES

PO1 - Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2 - Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3 - Design/Development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4 - Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5 - Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including predication and modeling to complex engineering activities with an understanding of the limitations.

PO6 - The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7 - Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8 - Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

PO9 - Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10 - Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11 - Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12 - Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES

PSO1: An ability to design and conduct experiments, as well as to analyze and interpret data.

PSO2: An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.

PSO3: An ability to understand the impact of engineering solutions in a global, economic, environmental and societal context.

PSO4: An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

I Semester

S. No.	Subject Code	Subject	Category	L	T	P	IM	EM	Credits
1	1821101	Mathematics – I	BSC	3	1	0	30	70	4
2	1822102	Engineering Physics	BSC	3	1	0	30	70	4
3	1823103	Basic Electrical Engineering	ESC	3	1	0	30	70	4
4	1824107	Engineering Graphics & Design	ESC	1	0	4	50	50	3
5	1825108	Engineering Physics Lab	BSC	0	0	3	50	50	1.5
6	1826106	Basic Electrical Engineering Lab	ESC	0	0	2	50	50	1
7	1827110	Workshop and Manufacturing Practices	ESC	1	0	4	50	50	3
		Total:		11	3		290	410	20.5

II Semester

S. No.	Subject Code	Subject	Category	L	T	P	IM	EM	Credits
1	1821201	Mathematics - II	BSC	3	1	0	30	70	4
2	1823202	Engineering Chemistry	BSC	3	1	0	30	70	4
3	1824203	English	HSMC	2	0	0	30	70	2
4	1805204	Programming for Problem Solving	ESC	3	0	0	50	50	3
5	1823207	Chemistry Lab	BSC	0	0	3	50	50	1.5
6	1805208	Programming for Problem Solving Lab	ESC	0	0	4	50	50	2
7	1824209	English Lab	HSMC	0	0	2	50	50	1
		Total:		11	02	09			17.5

III Semester

S. No.	Subject Code	Subject	Category	L	T	P	IM	EM	Credits
1	1821301	Mathematics – III	BSC	3	1	0	30	70	4
2	1821302	Managerial Economics and Financial Analysis	HSMC	3	0	0	30	70	3
3	1821303	Electronic Devices and Circuits	EC	3	0	0	30	70	3
4	1821304	Digital System Design	EC	3	0	0	30	70	3
5	1821305	Signals And Systems	EC	3	0	0	30	70	3
6	1821306	Network Theory	EC	3	0	0	30	70	3
7	1821307	Python Programming	ESC	0	0	3	50	50	1.5
8	1821308	Electronic Devices and Circuits Lab	EC	0	0	3	50	50	1.5
9	18994M1	Environmental Science	MC	2	0	0	30		0
		Total:							22

IV Semester

S. No.	Subject Code	Subject	Category	L	T	P	IM	EM	Credits
1	1823401	Biology for Engineers	BSC	2	0	0	30	70	2
2	1804402	Probability Theory and Stochastic Processes	EC	3	0	0	30	70	3
3	1785403	Analog and Digital Circuits	EC	3	0	0	30	70	3
4	1766404	Control Systems	EC	3	0	0	30	70	3
5	1747405	Linear IC Applications	EC	3	0	0	30	70	3
6	1728406	Electromagnetic Theory and Transmission lines	EC	3	0	0	30	70	3
7	1804407	LABVIEW Programming Lab	ESC	0	0	3	50	50	1.5
8	1804408	Analog and Digital Circuits Lab	EC	0	0	3	50	50	1.5
		Total:							20

V Semester

S. No.	Subject Code	Subject	Category	L	T	P	IM	EM	Credits
1	1804501	Microprocessors & Microcontrollers	EC	3	0	0	30	70	3
2	1804502	Digital Signal Processing	EC	3	0	0	30	70	3
3	1804503	Computer Organization	EC	2	0	0	30	70	2
4	1804504	Analog Communication	EC	3	0	0	30	70	3
5	1804505	Digital IC Applications	EC	3	0	0	30	70	3
6	1804506	Antennas and Wave Propagation	EC	3	0	0	30	70	3
7	1804507	Microprocessors & Microcontrollers Lab	EC	0	0	3	50	50	1.5
8	1804508	Analog and Digital IC Lab	EC	0	0	3	50	50	1.5
9	1804509	Socially Relevant Project	PR				100		2
		Total:							22

VI Semester

S. No.	Subject Code	Subject	Category	L	T	P	IM	EM	Credits
1	1804601	Embedded Systems	EC	3	0	0	30	70	3
2	1804602	Digital Communication	EC	3	0	0	30	70	3
3	1804603	Microwave Engineering	EC	3	0	0	30	70	3
		Professional Elective I							
4	1804604	Fiber-Optic Communication	PE	3	0	0	30	70	3
5	1804605	Data structures and Algorithms	PE	3	0	0	30	70	3
6	1804606	Digital Signal Processors & Architectures	PE	3	0	0	30	70	3
7	1804607	Analog IC Design	PE	3	0	0	30	70	3
8	1804608	Introduction to MEMS	PE	3	0	0	30	70	3

9		**Open Elective I**	OE	3	0	0	30	70	3
10	1804609	Analog and digital communication Lab	EC	0	0	3	50	50	1.5
11	1804610	Digital Signal Processing Lab	EC	0	0	3	50	50	1.5
12	1804611	Micro Wave &Optical Communication Lab	EC	0	0	4	50	50	2
13	18996M1	Organizational Behaviour	MC	3	0	0	30		0
14	1804613	Internship	PR				100		2
		Total:							22

VII Semester

S. No.	Subject Code	Subject	Category	L	T	P	IM	EM	Credits
1	1804701	Internet Of Things	EC	3	0	0	30	70	3
2	1804702	Electronic Measurements & Instrumentation	EC	3	0	0	30	70	3
		Professional Elective II							
3	1804703	Information Theory & Coding	PE	3	0	0	30	70	3
4	1804704	Real Time Operating Systems	PE	3	0	0	30	70	3
5	1804705	Scientific Computing	PE	3	0	0	30	70	3
6	1804706	CMOS Design	PE	3	0	0	30	70	3
7	1804707	Electromagnetic Interference & Compatibility	PE	3	0	0	30	70	3
		Professional Elective III							
8	1804708	Radar and Satellite Communication	PE	3	0	0	30	70	3
9	1804709	Computer System Architecture	PE	3	0	0	30	70	3
10	1804710	Digital Image & Video processing	PE	3	0	0	30	70	3
11	1804711	Digital IC Design	PE	3	0	0	30	70	3
12	1804712	Cognitive Radio	PE	3	0	0	30	70	3

13		**Open Elective II**	OE	3	0	0	30	70	3
14		**Open Elective III**	OE	3	0	0	30	70	3
15	1804713	IOT Lab	EC	0	0	2	50	50	1
16	1804714	Project Stage-I	PR	0	0	6	100	0	3
17	1824715	Human Values and Professional Ethics	MC	0	0	3	30	0	0
		Total:							22

VIII Semester

S. No.	Subject Code	Subject	Category	L	T	P	IM	EM	Credits
		Professional Elective IV							
1	1824801	Wireless Communication	PE	3	0	0	30	70	3
2	1804802	SoC Architecture	PE	3	0	0	30	70	3
3	1804803	Speech Processing	PE	3	0	0	30	70	3
4	1804804	Low Power VLSI	PE	3	0	0	30	70	3
5	1804805	RF System Design	PE	3	0	0	30	70	3
		Open Elective IV	OE	3	0	0	30	70	3
6	1804806	Technical Seminar	PR	0	0	2	100	0	1
7	1804807	Project Stage-II	PR	0	0	20	50	50	5
		Total:							12

Course Title	MATHEMATICS – I				B. Tech. ECE I Sem		
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**	
1821101	**BSC**	**L**	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exams**	**Total**
		3	1	--	4	30	70	100
Mid Exam Duration: 2Hrs					**End Exam Duration: 3Hrs**		

Course Objectives:

To enable the students to apply the knowledge of mathematics in various engineering fields by making them to learn the following:

- The essential tool of matrices in a comprehensive manner.
- The convergence of series.
- Maxima and minima of a function and the radius of curvature
- The Jacobians and extreme values of a function.
- Evaluate the definite integrals, Beta and Gamma functions. Apply Fourier series in engineering problems.

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	**Apply** the essential tool of matrices in a comprehensive manner.
CO 2	**Describe** the convergence of series.
CO 3	**Classify** the functions of several variables which is useful in optimization techniques.
CO 4	**Define** Beta and gamma functions and solve definite integrals.
CO 5	**Determine** the Fourier series of the functions.

UNIT - I

Matrices: (14 Hours)

Basic definitions of Symmetric, skew-symmetric and orthogonal matrices – Elementary transformations – Rank – Echelon form, Normal form– System of linear equations – Eigen values and Eigen vectors for real matrices – Cayley-Hamilton theorem – Diagonalization of matrix by orthogonal transformation.

UNIT - II

Sequences and series: (8 Hours)

Convergence of sequences and series – Comparison test – p test – D'Alemberts ratio test – auchy's root test. Power series – Series for exponential, trigonometric and logarithm functions.

UNIT - III

Differential Calculus: (10 Hours)

Taylor's and Maclaurin's series – Maxima and minima of single variable – Curvature: Curvature of a curve – Curvature of a circle – Radius of a curvature – Centre of Curvature – Equation to the circle ofcurvature.

UNIT - IV

Multivariable Calculus: (10 Hours)

Functions of two or more variables – Partial derivatives, Total derivative – Jacobians – Maxima andminima of functions of two variables – Lagrange's method of undetermined multipliers.

UNIT - V

Integral Calculus: (12 Hours)

Evaluation of definite integrals – Beta and Gamma functions and their properties.

Fourier series: Halfrange Fourier sine and cosine expansions – Parseval's theorem.

Text Books:

1. Dr. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers-43 edition 2014.
2. Erwin Kreyszig, Advanced Engineering Mathematics, Wiley Publications, 9th edition-2013.
3. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, Pearson, 9th Edition, Reprint, 2002.
4. Kolman, Bernard Hill, David R, Introductory Linear Algebra with applications.

Reference Books:

1. B.V. Ramana, Higher Engineering Mathematics, Mc. Graw Hill Education (India) Pvt. Ltd, New Delhi, 11th Edition, Reprint 2010.
2. D Poole, Linear Algebra: A Modern Introduction, 2nd Edition, Brooks/Cole, 2005.
3. N.P. Bali and Manish Goyal, A Text Book of Engineering Mathematics, Lakshmi Publications, Reprint 2008.
4. Greenberg Michael D, Advanced Engineering Mathematics, Cengage Publishers.

Course Title	ENGINEERING PHYSICS				B. Tech. ECE I Sem		
Course Code	Category	Hours/Week		Credits	Maximum Marks		
1822102	BSC	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		3	1	0	4	30	70	100
Mid Exam Duration: 2Hrs					End Exam Duration: 3Hrs		

Course Objectives:

- Expose studentsin understanding the basic laws of nature through wave equationusing the principles of oscillations and waves.
- Expose students to theoretical and mathematical aspects of Interference, Diffraction techniques and Lasers for testing of materials.
- Develop knowledge and understanding the fundamental concepts of Quantum mechanics.
- Develop knowledge and understanding the fundamental concepts of solids and semiconductors.
- Adaptability to new developments in science and technology.

Course Outcomes :Upon successful completion of the course, students will be able to

CO 1	**Describe** a mathematical wave equation using the principles of waves and oscillations.
CO 2	**Explain** the role of semiconductors in different realms of physics and their applications in both science and technology.
CO 3	**Apply** the knowledge of Sciences to solve engineering problems by using Interference and Diffraction techniques.
CO 4	**Analyze** the working elements of different lasers and parameters.

UNIT I

Wave Optics

Introduction, Huygens' Principle, Superposition of waves, Young's double slit experiment, expression for fringe width, interference in thin film by reflection, Newton's rings experiment, Diffraction Fraunhofer diffraction due to single slit, and Diffraction grating (N-slits).

UNIT II

Lasers: Introduction to lasers, characteristics of laser, interaction of radiation with matter-spontaneous and stimulated emission, Einstein's coefficients; population inversion, excitation mechanisms, types of lasers: Solid-state lasers – Nd-YAG laser, Gas lasers - He-Ne Laser, Semiconductor p-n junction diode laser, Applications of lasers

UNIT III

Damped and Forced Simple Harmonic Oscillator: Mechanical and electrical simple harmonic oscillators, Damped harmonic oscillator – Heavy, critical and light damping, Energy decay in a damped harmonic oscillator, Quality factor, Forced Mechanical and Electrical oscillators, Electrical and Mechanical impedance.

UNIT IV

Non-dispersive transverse and longitudinal waves in one dimension String: Transverse wave on a string, the wave equation on a string, Harmonic waves, Reflection and transmission of waves at a boundary, Impedance matching, Standing waves and their Eigen frequencies, Longitudinal waves and the wave equation for them.

UNIT V

Solids & Semiconductors: Introduction, Free electron theory of metals (drift velocity and electrical conductivity), Fermi-Dirac distribution, Kronig-Penney model and origin of energy bands, band structure of metals, semiconductors, and insulators. Direct and indirect band gap semiconductors, Intrinsic and extrinsic semiconductors, Dependence of Fermi level on carrier-concentration and temperature (equilibrium carrier statistics), diffusion and drift, p -n junction.

Text books:

1. Dr. M.N. Avadhanulu& Dr. P.G. Krishnasagar, Engineering Physics –S.Chand and Company
2. Ajoy Ghatak, Optics- McGraw Hill Publishers,6^{th} edition,
3. Halliday, Resnick and Walker, Fundamental of Physics- Wiley publications.
4. Hall H E, Solid State Physics, paramount Publications

Reference Books:

1. K.Thyagarajan, Engineering Physics –McGraw Hill Publishers
2. S.M.Sze , Semiconductor Devices- Wiley Publications.
3. Nelkon M parker P, Lasers & Non-linear Optics Arnold Heinemann Publications
4. Donald A, Neamen, Semiconductor physics and devices- Basic principle –McGraw Hill, 2002

Course Title	BASIC ELECTRICAL ENGINEERING				B. Tech. ECE I Sem		
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
1802103	**ESC**	**L**	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exams**	**Total**
		3	1	--	4	30	70	100
Mid Exam Duration: 2Hrs					**End Exam Duration: 3Hrs**			

Course Objectives:

- The objective of the course is to learn the concepts of circuit analysis which includes DC excitations and AC excitations, different types of DC generators, motors which are widely used in industry, Construction and working principle of 1-F Transformers & 3-F Induction Motors ,Components of low tension switchgear

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	**Understand** basic electric circuits and network solving techniques.
CO 2	**Analyze** RL, RC and RLC circuits for AC excitations
CO 3	**Understand** working principle, operation and construction of DC machines, 3-Ø induction motors and 1-Ø transformers
CO 4	**Understand** the components of low voltage electrical installations
CO 5	**Solve** the problems on EMF, Current ,Torque ,Regulation and Efficiency of DC machines ,3-Ø induction motor and 1-Ø transformer

UNIT – I

DC Circuits: Electrical circuit elements (R, L and C), voltage and current sources – source transformation, Series & Parallel networks - Star-Delta transformation, Kirchoff's current and voltage laws, Mesh and Nodal analysis of simple circuits with DC -Problems.

UNIT – II

AC Circuits: Representation of sinusoidal waveforms, average, peak and rms values, Form factor Peak factor for sinusoidal waveform - problems, phasor representation, impedance, admittance, reactance, susceptance, real power, reactive power, apparent power, power factor. Analysis of 1Φ ac circuits for series & parallel combinations - simple problems.

UNIT – III

DC machines: DC Generators: Construction– working principle – EMF equation – types of DC generators- applications - simple problems.

Working Principle of DC motor, types, Torque Equation, Concept of Back EMF- applications - simple Problems.

UNIT – IV

Transformers & Induction Machines: Single phase transformer - principle of operation, constructional details, emf equation, losses in transformer, regulation and efficiency, equivalent circuit - simple problems.

Three phase Induction Motor: Construction and working principle, slip, rotor frequency, rotor current, and rotor power factor –simple Problems.

UNIT – V

Electrical Installations: Components of LT switchgear: Switch Fuse Unit (SFU), Miniature Circuit Breaker (MCB), Wires and Cables, Earthing. Batteries, Introduction to power converters

Text Books:

1. D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.
2. D. C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2009.
3. L. S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press, 2011.
4. E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.

Reference Books:

1 . Don Johnson, Fundamentals of Electrical Engineering, Orange Grove Books.
2. V. D. Toro, "Electrical Engineering Fundamentals", Prentice Hall India, 1989.
3. A. Chakrabarti "Circuit Theory", Dhanapath Roy & Co.
4. Electrical Circuits – N. Sreenivasulu – Reem Publications.

Course Title	ENGINEERING GRAPHICS & DESIGN				B. Tech. ECE I Sem		
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exams**	**Total**
(1803107)	**ESC**	1	0	4	3	50	50	100
Mid Exam Duration: 2Hrs					**End Exam Duration: 3Hrs**			

Course Objectives:

- To Increase ability to communicate with people
- To Learn to sketch and take field dimensions.
- To Learn to take data and transform it into graphic drawings.
- To Learn basic Auto Cad skills.
- To Learn basic engineering drawing formats
- To Prepare the student for future Engineering positions

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	**Use** CAD drafting and editing tools along with page templates ,title block & print settings
CO 2	**Describe** the geometric details of Engineering objects & Become familiar with Auto Cad 2D 3D drawings
CO 3	**Understand** Engineering drawing basic theory of projections related to points lines, plane and solids in different orientations and drafting them in cad software
CO 4	**Analyze** various sectional views related to Engineering Drawings and Create isometric drawings with 3d tools along with basic theory& procedures in engineering drawing

UNIT-I

Overview of CAD: Listing the computer technologies that impact on graphical communication, Demonstrating knowledge of the theory of CAD software [such as: The Menu System, Toolbars (Standard, Object Properties, Draw, Modify and Dimension), Drawing Area (Background, Crosshairs, Coordinate System), Dialog boxes and windows, Shortcut menus (Button Bars), Status Bar, Different methods of zoom as used in CAD, Select and erase objects, copy, move, scaling objects, mirror, rotate, offset, polar array, rectangular Array.

UNIT-II

Customization & CAD Drawing: Consisting of set up of the drawing page and the printer, including scale settings, Setting up of units and drawing limits; ISO and ANSI standards for coordinate dimensioning; Orthographic, constraints, Snap to objects manually and automatically; Producing drawings by using various coordinate input entry methods, Applying various ways of drawing circles; Annotations, layering & other functions, Diagrams for practice covering drafting and editing commands

UNIT-III

Introduction to Engineering drawing: Principles of Engineering Graphics and their significance, Conic sections including the Rectangular Hyperbola (General method only); Cycloid, Epi cycloid, Hypocycloid and In volute.

UNIT-IV

Projection of Points, lines, Planes & solids: Principles of Orthographic Projections-Conventions - Projections of Points and lines inclined to both planes; Projections of planes inclined Planes Projections of Regular Solids

Projections of solids inclined to both planes. Floor plans that include: windows, doors, and fixtures such as WC, bath, sink, shower, etc

UNIT V

Sections and Sectional Views of Right Angular solids: Sections of Prism, Cylinder, Pyramid and Cone and representation of hatching for various sectional views in cad Development of surfaces of Right Regular Prism, Pyramid, Cylinder and Cone.

Isometric & ortho Graphic Projections: Principles of Isometric projection – Isometric Scale, Isometric Views, Orthographic projection and isometric projection techniques with 3d commands, Boolean operations(Union, Region, subtract etc…,)Representation of orthographic projections with viewports, Ucs orientation for representing dimensions for isometric diagrams, scaling.

Text Books:

1. K L. Narayana & P. Kannaiah, Engineering Drawing, 3/e, Scitech Publishers,Chennai, 2012.
2. N. D. Bhatt, Engineering Drawing, 53/e, Charotar Publishers, 2016.
3. Colin simmons, Denis Maguire and NeilPhelps, "Manual of Engineering Drawing: British and International Standards", Buffer Worth_ HeinemanmInc, Fifth Edition.
4. Thomas E French, Charless John Vierck, Robert J. Foster, "Engineering Drawing and Graphic Technology", Mc Graw- Hill International Edition.

Reference Books:

1. Dhanajay A Jolhe, Engineering Drawing, Tata McGraw-Hill, Copy Right,2009
2. Venugopal, Engineering Drawing and Graphics, 3/e, New Age Publishers,2000
3. Shah and Rana, Engineering Drawing, 2/e, Pearson Education,2009
4. K.C.John, Engineering Graphics, 2/e, PHI,2013

Course Title	ENGINEERING PHYSICS LAB				B. Tech. ECE I Sem		
Course Code	Category	Hours/Week		Credits	Maximum marks		
1822108	BSC	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		0	0	3	1.5	50	50	100
							End Exam Duration: 3Hrs	

Course Objectives:

- To explore the application of interference and diffraction by doing concerned experiments.
- Elucidate the concepts of Physics through involvement in the experiment by applying theoretical knowledge.
- Develop an ability to apply the knowledge of physics experiments in the later studies.
- To understand the concept of energy gap, B-H curve, and synthesis of nano material by performing the experiments**.**

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	**Evaluate** the interference, diffraction phenomena along with laser.
CO 2	**Use** scientific process in the conduct and reporting of experimental investigations.
CO 3	**Formulate** the measurement technology, usage of new instruments and real time applications in engineering studies.
CO 4	**Justify** the theoretical ideas and concepts covered in lecture by doing hands on in the experiments.
CO 5	**Develop** the characteristics of various materials in a practical manner and gain knowledge about various optical technique methods.
CO 6	**Examine** the physical laws using experimental data.

LIST OF EXPERIMENTS

Any 7 of the following experiments has to be performed in a semester:

1. Determination of wavelengths of spectral lines of mercury spectrum using diffraction grating in normal incidence method.
2. Determination of dispersive power of the prism.
3. Rigidity Modulus- Torsonal Pendulum.
4. Study of resonance effect in series and parallel LCR circuit.
5. Determination of thickness of thin object by wedge method.
6. Determination of radius of curvature of lens by Newton's Rings.
7. Laser: Determination of wavelength using diffraction grating.
8. Energy gap of a semiconductor using p-n junction diode.
9. Hysteresis: B-H curve.
10. Magnetic field along the axis of a current carrying coil – Stewart and Gee's method.
11. Frequency of the tuning fork - Melde's apparatus.
12. Spring constant - Coupled Pendulums.

Course Title	BASIC ELECTRICAL ENGINEERING LAB				B. Tech. ECE I Sem		
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum marks**	
1802106	**ESC**	**L**	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exams**	**Total**
		-	-	2	1	50	50	100
						End Exam Duration: 3Hrs		

Course Objectives:

- The objective of the course is to verify theoretically and practically Kirchhoff's laws, determination of R, L, and C Parameters, measure the power for RL, RC circuits, speed-torque characteristics of DC shunt motor, speed control of 3-F IM, performance of transformer.

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	**Understand** the Kirchhoff's laws by theoretically and practically.
CO 2	**Determine** the active and reactive power for RL, RC and RLC circuits.
CO 3	**Determine** equivalent circuit parameters on no-load and its performance on load of a 1-Ø transformer.
CO 4	**Analyze** the characteristics of DC shunt motor and 3-Ø Induction motor
CO 5	**Identify** various parts of DC and AC machines, fuse, MCB & Batteries.

List of Experiments

1. Determination of values of R, L and C parameters of a given R-L-C series circuit
2. Verification of KCL and KVL.
3. Determination of Active, reactive and apparent power for R-L circuit (series & parallel).
4. Determination of Active, reactive and apparent power for R-C circuit (series & parallel).
5. Load test on 1-phase transformer.
6. OC & SC tests on 1-phase transformer to obtain equivalent circuit.
7. Torque-speed characteristics of DC shunt motor.
8. Speed Control of three –phase induction motors using pole changing method
9. Demonstration of cut out sections of DC & AC machines
10. Study of fuse, MCB, Batteries

Course Title	WORKSHOP AND MANUFACTURING PRACTICES				B. Tech. ECE I Sem		
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**	
1803110	**ESC**	**L**	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exams**	**Total**
		1	0	4	3	50	50	100
					End Exam Duration: 3Hrs		

Course Objectives:

- To understand the basic knowledge of Workshop Practice and Safety.
- To identify and use of different hand tools and other instruments like Hack Saw, Jack Plane, Chisels etc. and operations like Marking, Cutting etc.
- To expose students to different types of manufacturing/fabrication processes
- To develop a skill in dignity of labour, precision, safety at work place, team working and development of right attitude.

Course Outcomes:: At the end of the course, the student will be able to

CO 1	**Identify** different manufacturing processes which are commonly employed in the industry
CO 2	**Analyze** the practical knowledge about fabricate components using different materials with their own hands
CO 3	**Understand** the knowledge of the dimensional accuracies and tolerances applicable for different manufacturing processes
CO 4	**Understand** the knowledge of the dimensional accuracies and tolerances applicable for different manufacturing processes

WORKSHOP AND MANUFACTURING PRACTICES:

LIST OF EXPERIMENTS IN THE SYLLABUS

1. MACHINE SHOP: 1. STEP TURNING OPERATION
2. TAPER TURNING OPERATION

2. FITTING SECTION: 1. SQUARE FITTING
2. STEEPED FITTING

3. CARPENTRY SECTION: 1. TEE HALVING JOINT
2. DOVETAIL TEE HALVING JOINT

4. HOUSE WIRING SECTION: 1. TO CONTROL TWO LAMPS BY ONE SINGLE WAY SWITCH (IN SERIES)

2. TO CONTROL TWO LAMPS BY ONE SINGLE WAY SWITCH(PARALLEL)

5. WELDING SECTION: 1. SINGLE V BUTT JOINT
2. LAP JOINT

6. FOUNDRY SECTION: 1. SINGLE PIECE SQUARE PATTERN
2. SINGLE PIECE ROUND PATTERN

7. SHEET METAL SECTION

1. SQUARE TRY
2. CYLINDER

Textbooks:

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 and publishers private limited, Mumbai.
2. Rao P.N., ―Manufacturing Technology‖, Vol. I and Vol. II, Tata McGrawHill House, 2017.
3. K. Venugopal, V.Prabhu Raja, Engineering Drawing + Auto Cad, New AgeInternational Publishers.
4. Kulkarni D.M, AP Rastogi and AK Sarkar, Engineering Graphics with Auto Cad, PHI Learning, Eastern Economy editions.

Reference Books:

1. Kalpakjian S. And Steven S. Schmid, ―Manufacturing Engineering and Technology ‖, 4th edition, Pearson Education India Edition, 2002.
2. Gowri P. Hariharan and A. Suresh Babu,‖Manufacturing Technology – I‖ Pearson Education,2008.
3. Roy A. Lindberg, ―Processes and Materials of Manufacture‖, 4th edition, Prentice Hall India, 1998.
4. Basant Agarwal & C.M.Agarwal, Engineering Drawing, Tata McGraw-Hill,Copy Right, 2008.

Course Title	MATHEMATICS – II					B. Tech. ECE II Sem		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1821201	BSC	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		3	1	--	4	30	70	100
Mid Exam Duration: 2Hrs					End Exam Duration: 3Hrs			

Course Objectives:

- To enable the students to apply the knowledge of mathematics in various engineering fields by making them to learn the following:
- First order differential equations.
- Linear differential equations with constant coefficients.
- Laplace transforms in engineering problems.
- Evaluate multiple integrals.
- Understand Vector Calculus concepts and their applications.

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	Solve the first order differential equations.
CO 2	Solve linear differential equations with constant coefficients.
CO 3	Apply Laplace Transforms in engineering problems.
CO 4	Evaluation of multiple integrals.
CO 5	Understand Vector Calculus concepts and their applications.

UNIT I

First order ordinary differential equations:

Linear, Bernoulli equations, Exact and equations reducible to Exact Applications: Orthogonal trajectories, Newton's law of cooling, Law of natural growth and decay.

UNIT I

Ordinary differential equations of higher order:

Linear differential equations of second and higher order with constant coefficients – R.H.S term of the type e^{ax}, sinax, cosax, polynomials in x, e^{ax} V(x), xV(x) – Method of variation of parameters.

UNIT III

Laplace transforms:

Laplace transforms of standard functions – Properties of Laplace Transforms – Transforms of derivatives and integrals– Evaluation of integrals by Laplace transforms – Laplace transform of periodic functions. Convolution theorem. Inverse Laplace Transforms – Applications of Laplace transforms to ordinary differential equations.

UNIT IV

Multiple Integrals: Evaluation of double integrals in Cartesian coordinates and polar coordinates – Change of variables in double integrals – Change the order of integration in double integrals – Evaluation of triple integrals in Cartesian and polar coordinates – Change of variables in triple integrals.

UNIT V

Vector calculus: Vector differentiation: Scalar point function - Vector point function – Vector operator Del – Gradient – Divergence – Curl. Vector integration: Line, Surface and Volume integrals. Green's theorem in a plane, Stoke's theorem and Gauss-divergence theorems (Statements only).Applications of Green's, Stoke's and Gauss divergence theorems.

Textbooks:

1. B. S. Grewal, Higher Engineering Mathematics, 44/e, Khanna Publishers, 2017.
2. P. Kandasamy, K. Thilagavathy, K. Gunavathi, Numerical Methods, S. Chand & Company, 2/e, Reprint 2012.
3. Walpole, Myers, Myers, Ye, Probability & Statistics for Engineers & Scientists, Seventh Edition, Pearson Education Asia.
4. Curtis F.Gerald, Patrick O.Wheatley, Applied Numerical Analysis, Seventh Edition, Pearson Education.

References:

1. Veerarajan T., Engineering Mathematics, Tata McGraw-Hill, New Delhi, 2008.
2. Erwin Kreyszig, Advanced Engineering Mathematics, 9/e, John Wiley & Sons, 2006.
3. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2010.
4. Johnson, Probability and Statistics for Engineers, Prentice Hall of India, Fifth edition.

Course Title	ENGINEERING CHEMISTRY					B. Tech. ECE II Sem		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1823202	BSC	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		3	1	--	4	30	70	100
Mid Exam Duration: 2Hrs					End Exam Duration: 3Hrs			

Course Objectives:

- Knowledge in Chemistry serves as basic nutrient for the understanding and thereby design of materials of importance in life. Thus the advancement in Engineering depend on the outcome of basic sciences.
- The Engineering Chemistry course for undergraduate students is framed to strengthen the fundamentals of chemistry and then build an interface of theoretical concepts with their industrial! Engineering applications.
- The course main aim is to impart in-depth knowledge of the subject and highlight the role of chemistry principles (or) applications in the field of engineering.
- An attempt has been made to logically correlate the topic with its application.
- After the completion of the course, the student would understand about the concepts of chemistry.

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	Analyze microscopic chemistry in terms of atomic and molecular orbitals and intermolecular forces. Rationalize bulk properties and processes using thermodynamic considerations.
CO 2	Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques.
CO 3	Rationalize periodic properties such as ionization potential, electro negativity, oxidation states and electro negativity.
CO 4	List major chemical reactions that are used in the synthesis of molecules.

UNIT-I:

Atomic and molecular structure

Schrodinger wave equation. Particle in a box (one dimensional) and their applications .Molecular orbital's of diatomic molecules and plots of the multicenter orbital's. Equations for atomic and molecular orbital's.Crystal field theory and the energy level diagrams for transition metal ions and their magnetic properties.Band structure of solids and the role of doping on band structures.

Learning Outcomes: At the end of this unit, the student will be able to

*****Apply Schrodinger wave equation to particle in a box.

*****Illustrate the molecular orbital energy diagrams of diatomic molecules.

*****Get knowledge on properties of conductors, semiconductors and insulators and role

of doping.

*****Discuss the magnetic behavior of transition metal complexes.

UNIT-II:

Periodic properties

Effective nuclear charge, penetration of orbital's, 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 electro negativity, polarizability, oxidation states, coordination numbers and geometries, hard, soft acids and bases.

Learning Outcomes: At the end of this unit, the student will be able to

*Describe the arrangement of the elements in the periodic table.

*Explains the discovery of electron ,proton and neutron and their characteristics.

*Explains the rules of electron filling in atoms and writes the electronic configuration.

* Explains the energies of s ,p, d, f orbitals & identifies the periodic properties and can explainhow they vary in group and period.

*Illustrate the geometries of complex structures and explains the acid- base nature

UNIT- III :

Intermolecular forces

Ionic, dipolar and van Der Waals interactions. Equations of state of real gases and criticalphenomena.

Use of free energy in chemical equilibria

Thermodynamic functions: Introduction, define energy, entropy, Free energy. Free energy and emf. Cell potentials, Nernst equation and applications. Water chemistry-types of water and Boilertroubles. Corrosion-types of corrosion and factors influencing corrosion.

Learning Outcomes: At the end of this unit, the student will be able to

*****Explains the formation of ionic bond and dipolar interactions**.**

*Explains the behavior of real gases and describe the conditions required for liquification andgases and critical phenomenon.

*Illustrate the definitions of energy and entropy and apply Nernst equation for calculating cellpotentials.

* List the differences between temporary and permanent hardness and illustrate problems associated with use of hard water in boilers

* Demonstrate corrosion types and factors influencing corrosion.

UNIT - IV:

Spectroscopic techniques and applications

Principles of spectroscopy and selection rules. Electronic spectroscopy. Fluorescence and its applications in medicine. Vibrational and rotational spectroscopy of diatomic molecules.

Learning Outcomes: At the end of this unit, the student will be able to

*****Explains principles of spectroscopy and explains different types of spectral series inelectromagnetic spectrum.

*****Illustrate the principle of fluorescence and its application in medicine

*Derive equation for rotational and vibrational spectra and its application for diatomic molecules.

UNIT - V:

Stereochemistry

Representations of 3 dimensional structures, structural isomers and stereo isomers, configurationsand symmetry and chirality, enantiomers, diastereomers, optical activity, absolute configurations and conformational analysis of Cyclohexane.

Simple Organic Reactions

Introduction to reactions involving Substitution (SN^1 &SN^2), Addition Reactions involving C=C(Mark on ikoff reaction) & C=O(Grignardreagent), Elimination(E_1&E_2)Oxidation(Baeyer villiger reaction),Reduction(Clemmensen reduction).

Learning Outcomes: At the end of this unit, the student will be able to

*Represent the organic molecule in 3-dimensional structure.

*Explains different types of isomers with examples.

*Illustrate the mechanisms of substitution, addition and elimination reaction.

*Explains oxidation and reduction reactions.

Text Books:

1. Shashi Chawla, A textbook of Engineering chemistry, Dhanpat Rai & Co publications
2. Peter Atkins, Julio de Paula and James Keeler, Atkins' Physical Chemistry, Oxford University Press, 2010.
3. Glasstone, An Introduction to Electrochemistry, Arihant Publications.
4. Clayden and Warren, Organic chemistry, Oxford publications

Reference Books:

1. Jain and Jain, Textbook of Engineering Chemistry, DhanpatRai& Co publications, 2013
2. J. D. Lee, New Concise Inorganic Chemistry, 5th Edition, Oxford University Press, 2008.
3. Douglas A. Skoog, Principles of Instrumental Analysis, 6th edition, Cengage Publications.
4. Cotton F Albert, Wilkinson Geoffrey, Advanced Inorganic Chemistry, Prism Publications

Course Title	ENGLISH					B. Tech. ECE II Sem		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1824203	HSMC	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		2	-	--	2	30	70	100
Mid Exam Duration: 2Hrs					End Exam Duration: 3Hrs			

Course Objectives:

- To improve the language proficiency of the students in English with an emphasis on LSRW Skills.
- To develop an awareness in the students about the significance of silent reading and comprehension
- To equip the students study academic subjects with greater facility through theoretical and practical components of the syllabus.
- To develop study skills as well as communication in formal and informal situations.
- To develop an awareness in the students about writing as an exact and formal skill.

Course Outcomes: On successful completion of this course, the students will be able to	
CO 1	Retrieve the knowledge of basic grammatical concepts
CO 2	Understand the context, topic, and pieces of specific information from social or transactional dialogues spoken by native speakers of English
CO 3	Apply grammatical structures to formulate sentences and correct word forms
CO 4	Analyze discourse markers to speak clearly on a specific topic in informal discussions
CO 5	Evaluate reading/listening texts and to write summaries based on global comprehension of these texts.
CO 6	Create a coherent paragraph interpreting a figure/graph/chart/table

1. Vocabulary Building

1.1 The concept of Word Formation
1.2 Root word from foreign languages and their use in English
1.3 Acquaintance with prefixes and suffixes from foreign languages in English to form derivatives
1.4 Synonyms, antonyms
1.5 Idioms and phrases.

2 Basic Writing Skills

2.1 Sentence Structures
2.2 Use of phrases and clauses in sentences
2.3 Importance of proper punctuation
2.4 Creating coherence
2.5 Organizing principles of paragraphs in documents
2.6 Techniques for writing precisel

3 Transformation

3.1 Interchange of parts of speech
3.2 Active voice and Passive voice
3.3 Direct and Indirect speech
3.4 3.4Degrees of comparison
3.5 3.5Simple, compound and complex sentences

1. **Identifying Common Errors in Writing**

a. Subject-Verb agreement
b. Noun-pronoun agreement
c. Misplaced modifiers
d. Articles
e. Prepositions
f. Redundancies
g. Clichés
h. Tenses

2. **Reading and Writing Practices**

a. Comprehension
b. Précis Writing
c. Essay writing
d. Essay writing

Suggested Readings:

(i) Practical English Usage. Michael Swan. OUP. 1995.
(ii) Remedial English Grammar. F.T. Wood. Macmillan.2007
(iii) On Writing Well. William Zinsser. Harper Resource Book. 2001
(iv) Study Writing. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press. 2006.
(v) Communication Skills. Sanjay Kumar and PushpLata. Oxford University Press. 2011.
(vi) Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press.

Course Title	PROGRAMMING FOR PROBLEM SOLVING				B. Tech. ECE II Sem		
Course Code	Category	Hours/Week			Credits	Maximum Marks	
1805204	ESC	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		3	-	--	3	30	70	100
Mid Exam Duration: 2Hrs					End Exam Duration: 3Hrs		

Course Objectives:

- The course aims to provide exposure to problem-solving through programming
- It aims to train the student to the basic concepts of the C programming language

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	Formulate simple algorithms for arithmetic and logical problems and translate the algorithms to programs
CO 2	Choose the loops and decision making statements to solve the problem.
CO 3	Implement different Operations on arrays.
CO 4	Use functions to solve the given problem.
CO 5	Understand structures, unions and pointers

UNIT I

Introduction to Computers: - Introduction, computer hardware and software, creating and running programs, software development life cycle, algorithms, flowcharts.

Introduction to C programming: - Overview of C, structure of a C program, variables, constants, data types, identifiers, keywords, Input/output statements in C, programming examples.

UNIT II

Operators and Expressions:-Operators, expressions, precedence and associativity, evaluating expressions, type conversion, typedef, enumerations.

Decision making statements: if statement, if-else statement, nested if-else statement, switch statement.

Loops in C: while loop, for loop, do-while loop, nested for loops,

Jumping statements: break, continue and goto statements.

UNIT III

Arrays: Introduction, Declaration and initialization of 1D and 2D arrays.

Array applications: -bubble (exchange) sort, selection sort, linear search, binary search.

Strings: -Definition, declaration and initialization of strings, string I/O functions, string handling functions, array of strings (table of strings).

UNIT IV

Functions: introduction, category of functions, parameter passing methods, storage classes, recursive function.

Pointers: Understanding pointers, declaring and initialization of pointer variable, accessing the address of variables, accessing a variable through its pointer, chain of pointers.

UNIT 5

Structures and union: Introduction, defining a structure, declaring structure variable, structure initialization, accessing members of structure, copying and comparing structure variables, structures within structures, array of structures, and introduction of union.

TEXT BOOKS:

1. E. Balagurusamy, Programming in ANSI C, Fifth Edition, McGraw Hill.
2. Rema Theraja, Programming in C, second edition, Oxford.
3. Fundamentals of Data Structures in C, Ellis Horowitz, SartajSahni, Susan Anderson- Freed, Computer Science Press.
4. Programming in C and Data Structures, J.R.Hanly, Ashok N. Kamthane and A. AnandaRao, Pearson Education

REFERENCE BOOKS:

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India
2. R.G. Dromey, How to solve it by Computer, Pearson.
3. Yashavant Kanetkar, Let us C, 15th edition, BPB Publications.
4. Dr. P. ChennaReddy, Computer Fundamentals and C Programming, Second Edition.

Course Title	CHEMISTRY LAB					B. Tech. ECE II Sem		
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
1805204	**BSC**	**L**	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exams**	**Total**
		-	-	3	1.5	50	50	100
						End Exam Duration: 3Hrs		

Course Objectives:

- The chemistry laboratory course will consist of experiments illustrating the principles of chemistry relevant to the study of science and engineering.

Course Outcomes: On successful completion of this course, the students will be able to	
CO 1	Estimate rate constants of reactions from concentration of reactants/products as a function of time.
CO 2	Measure molecular/system properties such as surface tension, viscosity, conductance of solutions, redox potentials, chloride content of water, etc.
CO 3	Synthesize a small drug molecule and analyse a salt sample.

Choice of experiments from the following:

1. Estimation of Hardness of Water present in given water sample by EDTA method.
2. Determination of surface tension and viscosity.
3. Determination of chloride content of water.
4. Colligative properties using freezing point depression.
5. Estimation of Dissolved Oxygen present in given water sample by Winkler's method.
6. Potentiometry - determination of Redox potentials and emfs.
7. Synthesis of a polymer/drug.
8. Saponification/acid value of oil.
9. Determination of cell constant and conductance of solutions..
10. Chemical oscillations- Iodine clock reaction.
11. Determination of the partition coefficient of a substance between two immiscible liquids.
12. Adsorption of acetic acid by charcoal.

Course Title	PROGRAMMING FOR PROBLEM SOLVING LAB				B. Tech. ECE II Sem		
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**	
1805208	**ESC**	**L**	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exams**	**Total**
		-	-	4	2	50	50	100
					End Exam Duration: 3Hrs		

Course Objectives:

- To impart knowledge so that the student will
- know how to write and debug programs
- know the principles of designing structured programs
- Know when and how to use the appropriate statements available in the C language.
- Write basic C programs using, Selection statements, Repetitive statements, Functions, Pointers, Arrays, Strings and structures

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	Formulate the algorithms for simple problems.
CO 2	Translate given algorithms to a working and correct program
CO 3	Correct syntax errors as reported by the compilers.
CO 4	Identify and correct logical errors encountered at run time
CO 5	Write iterative as well as recursive programs
CO 6	Represent data in arrays, strings and structures and manipulate them through a program

DOS commands, Algorithms, Flowcharts and sample C programs

1. Practice DOS commands necessary for design of C programs.
2. Design and develop algorithms and flowcharts for simple and logical problems
3. If the total selling price of 15 items and total profit earned on them is input through the keyboard. Write a C program to find the cost price of one item.
4. Ramesh's basic salary is input through the keyboard. His dearness allowance is 40% of basic salary and house rent allowance is 20% of basic salary. Write a C program to calculate his gross salary.
5. The distance between two cities (in km) is input through the keyboard. Write a C program to convert and print the distance in meters, centimetres, inches and feet.
6. Write a program to take input of name, roll no and marks obtained by a student in 5 subjects each have its 100 full marks and display the name, roll no with percentage score secured.

Problems involving if-then-else structures

7. Write a C program to find out whether a given number is even number or odd number.
8. Write a C program to check whether a given year is leap year or not.
9. Design and develop an algorithm that takes three coefficients (***a***, ***b***, and ***c***) of a Quadratic equation ($\boldsymbol{a}x^2+\boldsymbol{b}x+\boldsymbol{c}=0$) as input and compute all possible roots. Implement a C program for the developed algorithm and execute the same to output the possible roots

for a given set of coefficients with appropriate messages.

10. If the ages of the Ramesh, Suresh and Mahesh are input through the keyboard, write a C program to determine youngest of the three.

11. A character is entered through keyboard. Write a C program to determine whether the character entered is a capital letter, a small case letter, a digit or a special symbol using if-else and switch case. The following table shows the range of ASCII values for various characters.

Characters	**ASCII values**
A – Z	65 – 90
a – z	97 – 122
0 – 9	48 – 57
Special symbols	0 – 47, 58 – 64, 91 – 96, 123 – 127.

12. A library charges fine for every book returned late. For first five days the fine is 50 paisa, for 6-10 days fine is one rupee and above 10 days fine is 5 rupees. If you return the book after 30 days your membership will be cancelled. Write a C program to accept the number of days that the member is late to return the book and display the fine or appropriate message.

13. Write a C program which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +, -, *, /, % and use switch statement).

Problems involving Looping statements

14. If the sum of the cubes of each digit of a number is equal to the number itself, then the number is called Armstrong number. (for example, $153 = 1^3+5^3+3^3$). Design and develop an algorithm to find whether a given number is Armstrong number or not. Implement a C program for the developed algorithm.

15. Design and develop an algorithm to find the square root of a given number ***N***. Implement a C program for the same and execute for all possible inputs with appropriate messages. Note: **Don't use library function *sqrt(n)*.**

16. If a number and its reversed number are same then the number is called as palindrome number. Design and develop an algorithm to check whether a given number is palindrome or not. Implement a C program for the same.

17. Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.

18. Write a C program to evaluate the sin(x) function series

$$\sin x = \frac{x}{1!} - \frac{x3}{3!} + \frac{x5}{5!} - \frac{x7}{7!} + \cdots$$

19. **Fibonacci Sequence**

A Fibonacci sequence is defined as follows:
The first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a program to generate the first N terms of the sequence.

Arrays

20. Write a C program to find the smallest and largest number in a given array.
21. Write a C program to find the frequency of a particular number in a list of integers.
22. Write a C program to sort the list of elements using

a) Bubble Sort b) Selection sort.

23. Write a C program to search for an element in a list of elements using

a) Linear search b) Binary search

24. Write a C program to find the transpose of a matrix.

25. Write a C program to read two matrices and perform the following operations

a) Addition of two matrices

b) Multiplication of two matrices

Additional Problems on arrays

26. **Partitioning an array**

Given a randomly ordered array of n elements, write a C program to partition the elements into two subsets such that elements $\leq X$ are in one subset and elements $\geq X$ are in another subset.

27. **Finding the k^{th} smallest element**

Given a randomly ordered array of n elements, write a C program to determine the k^{th} smallest element.

28. **Array order reversal**

Write a C program to rearrange the elements in an array so that they appear in reverse order.

Strings

29. If a string and its reversed string are same then the string is called as palindrome string. Design and develop an algorithm to check whether a given string is a palindrome or not and implement a C program for the same.

30. Write a C program to sort the names of students in a class in alphabetical order.

Additional Problems on strings

31. Write a C program to read two strings and perform the following operations without using built string library functions.

i) String length

ii) String reversing

iii) Comparison of two strings

iv) Concatenation of two strings

32. Write a C program to count the number of vowels, consonants, digits, blank spaces and special characters in a given string.

Functions and Recursion

33. Write a C program to swap the contents of two variables using

a) Call by value

b) Call by reference.

34. Write a C program using recursion to

a) Find the factorial of a given number

b) Print the Fibonacci series up to a given number.

c) Find the GCD of two integers.

Structures

35. Write a C program to define a structure with the following members.

Roll No., Name, marks in Sub1, Sub2, Sub3. Read the n students records and find the total marks of each student and print the result in the following format.

Roll No	Name	Sub1	Sub2	Sub3	Total marks	result
189Y1A0501	Kavya	80	70	75	225	Distinction

36. Write a C program to copy the contents of one file to another file.

TEXT BOOKS

1. Yashavant Kanetkar, Let us C, 15th edition, BPB publications.
2. E. Balagurusamy, Programming in ANSI C, Fifth Edition, McGraw Hill.
3. R.G. Dromey, How to solve it by Computer, Pearson.

Course Title	ENGLISH LAB					B. Tech. ECE II Sem		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1824209	HSMC	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		-	-	2	1	50	50	100
						End Exam Duration: 3Hrs		

Course Objectives:

- To improve the language proficiency of the students in English with an emphasis on LSRW Skills.
- To develop an awareness in the students about the significance of silent reading and comprehension
- To equip the students study academic subjects with greater facility through theoretical and practical components of the syllabus.
- To develop study skills as well as communication in formal and informal situations.
- To develop an awareness in the students about writing as an exact and formal skill.

Course Outcomes: On successful completion of this course, the students will be able to	
CO 1	Retrieve the knowledge of basic grammatical concepts
CO 2	Understand the context, topic, and pieces of specific information from social or transactional dialogues spoken by native speakers of English
CO 3	Apply grammatical structures to formulate sentences and correct word forms
CO 4	Analyze discourse markers to speak clearly on a specific topic in informal discussions
CO 5	Evaluate reading/listening texts and to write summaries based on global comprehension of these texts.
CO 6	Create a coherent paragraph interpreting a figure/graph/chart/table

Syllabus:

- Oral Communication (This unit involve interactive practice sessions in Language Lab)
- Listening Comprehension---------- Language Lab
- Pronunciation, Intonation, Stress and Rhythm ---------- Language Lab
- Everyday Situations: Conversations and Dialogues ---------- Communication Lab
- Communication at workplace ---------- Communication Lab
- Interviews----------Communication Lab
- Formal Presentations ---------- Communication Lab

Text Books:

1) Cambridge Advanced Learners' English Dictionary with CD.
2) Grammar Made Easy by Darling Kindersley.
3) Punctuation Made Easy by Darling Kindersley.
4) Oxford Advanced Learner's Compass, 8th Edition.
5) English in Mind (Series 1-4), Herbert Puchta and Jeff Stranks with MeredithLevy, Cambridge.
6) English Pronunciation in Use (Elementary, Intermediate, Advanced)Cambridge University Press.
7) TOEFL and GRE (KAPLAN, AARCO and BARRONS, USA, Cracking GRE by CLIFFS).