

**COURSE STRUCTURE
AND
DETAILED SYLLABUS
R15 REGULATIONS**

**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 create 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 center 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 prediction 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 Name	Category	L	T	P	IM	EM	CR
1	1521101	Mathematics-1	BS	3	1	0	30	70	3
2	1521102	Mathematics-2	BS	3	1	0	30	70	3
3	1503103	Engineering Graphics	ED	1	0	3	30	70	3
4	1524104	English-1	HS	4	0	0	30	70	3
5	1505105	Programming in C	ED	3	1	0	30	70	3
6	1501106	Environmental Studies	HS	4	0	0	30	70	3
7	1505107	Programming in C Lab	ED	0	0	3	50	50	2
8	1599108	Engineering Workshop	ED	0	0	3	50	50	2
Total									22

II SEMESTER

S.No	Subject Code	Subject Name	Category	L	T	P	IM	EM	CR
1	1522201	Engineering Physics	BS	3	1	0	30	70	3
2	1521202	Mathematics-3	BS	3	1	0	30	70	3
3	1523203	Engineering Chemistry	BS	3	1	0	30	70	3
4	1524204	English-2	HS	4	0	0	30	70	3
5	1502205	Electrical Circuits	PJ	3	1	3	30	70	3
6	1525206	Human Values and Professional Ethics	HS	4	0	0	30	70	3
7	1524207	English Language and Communication Skills Lab	HS	0	0	3	50	50	2
8	1599208	Physics and Chemistry Lab	BS	0	0	3	50	50	2
Total									22

III SEMESTER

S. No.	Subject Code	Subject Name	Category	L	T	P	IM	EM	CR
1	1521301	Mathematics-4	BS	3	1	0	30	70	3
2	1504302	Electromagnetic Fields	PN	3	1	0	30	70	3
3	1504303	Electronic Devices and Circuits	PJ	3	1	0	30	70	3
4	1504304	Signals and Systems	PJ	3	1	0	30	70	3
5	1502305	Network Theory	PN	3	1	0	30	70	3
6	1512306	Electrical Machines	PJ	3	1	0	30	70	3
7	1512307	Electrical Engineering Lab	PN	0	0	3	50	50	2
8	1504308	Electronic Devices & Circuits Lab	PJ	0	0	3	50	50	2
Total									22

IV SEMESTER

S. No.	Subject Code	Subject Name	Category	L	T	P	IM	EM	CR
1	1504401	Analog Communications	PJ	3	1	0	30	70	3
2	1504402	Switching Theory and Logic Design	PJ	3	1	0	30	70	3
3	1504403	Electronic Circuit Analysis	PJ	3	1	0	30	70	3
4	1504404	Pulse and Digital Circuits	PJ	3	1	0	30	70	3
5	1504405	Electromagnetic waves & Transmission Lines	PJ	3	1	0	30	70	3
6	1504406	Probability Theory & Stochastic Processes	PJ	3	1	0	30	70	3
7	1504407	Electronic Circuit Analysis Lab	PJ	0	0	3	50	50	2
8	1504408	Pulse & Digital Circuits Lab	PJ	0	0	3	50	50	2
Total									22

V SEMESTER

S. No.	Subject Code	Subject	Category	L	T	P	IM	EM	CR
1	1504501	Microprocessors & Interfacing	PJ	4	0	0	30	70	3
2	1504502	Linear IC Applications	PJ	4	0	0	30	70	3
3	1504503	Digital Communications	PJ	4	0	0	30	70	3
4	1504504	Antenna and Wave Propagation	PJ	4	0	0	30	70	3
5	1515505	Computer Organization	PN	4	0	0	30	70	3
6	1504506	Digital IC Applications	PJ	4	0	0	30	70	3
7	1504507	IC Applications Lab	PJ	0	0	3	50	50	2
8	1504508	Communication Engineering Lab	PJ	0	0	3	50	50	2
Total									22

VI SEMESTER

S. No.	Subject Code	Subject	Category	L	T	P	IM	EM	CR
1	1525601	Managerial Economics & Financial Analysis	HS	4	0	0	30	70	3
2	1504602	Digital Signal Processing	PJ	4	0	0	30	70	3
3	1504603	Microwave Engineering	PJ	4	0	0	30	70	3
4	1512604	Control Systems	PN	4	0	0	30	70	3
5	1504605	Microcontrollers and Applications	PJ	4	0	0	30	70	3
		Elective-I							
6	1515606	Data structures	PN	4	0	0	30	70	3
7	1515607	Computer Network	PN	4	0	0	30	70	3
8	1515608	Database Management Systems	PN	4	0	0	30	70	3
9	1504609	Microprocessors & Microcontrollers Lab	PJ	0	0	3	50	50	2
10	1504610	Digital Signal Processing Lab	PJ	0	0	3	50	50	2
Total									22

VII SEMESTER

S. No.	Subject Code	Subject	Category	L	T	P	IM	EM	CR
1	1525701	Management Science	HS	4	0	0	30	70	3
2	1504702	VLSI Design	PJ	4	0	0	30	70	3
3	1504703	Electronic Measurements and Instrumentation	PJ	4	0	0	30	70	3
4	1504704	Optical communications	PJ	4	0	0	30	70	3
5	1504705	Digital Image Processing	PJ	4	0	0	30	70	3
		Elective-II							
6	1504706	Embedded Real Time Operating Systems	PJ	4	0	0	30	70	3
7	1504707	Neural networks and Fuzzy Logic	PJ	4	0	0	30	70	3
8	1504708	Data Communications	PJ	4	0	0	30	70	3
9	1504709	Microwave & Optical Communications Lab	PJ	0	0	3	50	50	2
10	1504710	VLSI Lab	PJ	0	0	3	50	50	2
Total									22

VIII SEMESTER

S. No.	Subject Code	Subject	SC	L	T	P	IM	EM	CR
1	1504801	Cellular & Mobile Communications	PJ	4	0	0	30	70	3
2	1504802	Satellite Communications	PJ	4	0	0	30	70	3
		Elective -III							
3	1504803	RADAR Systems	PJ	4	0	0	30	70	3
4	1504804	Speech Processing	PJ	4	0	0	30	70	3
5	1504805	OOPS through Java Programming	PJ	4	0	0	30	70	3
		Elective-IV							
6	1504806	Data Acquisition Systems	PJ	4	0	0	30	70	3
7	1504807	Spread Spectrum Communications	PJ	4	0	0	30	70	3
8	1504808	Biomedical Instrumentation	PJ	4	0	0	30	70	3
9	1504809	Seminar	PJ	0	0	0	100	0	3
10	1504810	Project	PJ	0	0	0	50	50	10
Total									25

Course Title	MATHEMATICS – I (R15)				B. Tech. I Sem (Common to All Branches)			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1521101	BS	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		3	1	--	3	30	70	100
Mid Exam Duration: 90 Min					End Exam Duration: 3Hrs			
Course Objectives:								
<ul style="list-style-type: none"> To enable the students to apply the knowledge of mathematics in various engineering fields by making them to learn the following: To make the students to understand differential equations and to make use these equations not only in mathematics but also in solving engineering problems. To make the students to understand the importance of differential calculus double integrals and triple integrals. 								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Apply differential equations to solve engineering problems.							
CO 2	Apply differential equations of higher order to solve engineering problems.							
CO 3	Determine the functions as series expansions.							
CO 4	Define radius of curvature and find them.							
CO 5	Determine the multiple integrals in Cartesian and Polar coordinates.							

UNIT I

Differential equations of first order and first degree: Exact, Non exact, Linear and Bernoulli equations. Applications: Orthogonal trajectories, Newton's law of cooling, Law of natural growth and decay.

UNIT II

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

UNIT III

Simple examples of Taylor's and Maclaurin's series – Functions of two or more variables Jacobians – Maxima and minima of functions of two variables – Lagrange's method of undetermined multipliers.

UNIT IV

Curvature: Curvature of a curve – Curvature of a circle – Radius of a curvature – Centre of Curvature – Equation to the circle of curvature. Curve tracing – Cartesian, polar and parametric curves.

UNIT V

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.

Text Books:

1. Higher Engineering Mathematics, Dr. B.S. Grewal, Khanna Publishers-42 edition.
2. Higher Engineering Mathematics, B.V. Ramana, Mc. Graw Hill Education (India) Pvt. Ltd
3. Calculus and Analytic geometry, G.B. Thomas and R.L. Finney, Pearson, 9th Edition, Reprint, 2002.
4. Introductory Linear Algebra with applications, Kolman, Bernard Hill, David R

Reference Books:

1. Advanced Engineering Mathematics, Erwin Kreyszig, Willey Publications, 9th edition- 2013
2. Engineering Mathematics Volume-1, Dr. D.S Chandra Sekharaiah, Prism Books Pvt. Ltd.
3. Advanced Engineering Mathematics by N. Bali, M Goyal, Firewall Media 7th edition.
4. Advanced Engineering Mathematics, Greenberg Michael D, Cengage Publishers.

Course Title	MATHEMATICS – II				B. Tech. I Sem (Common to EEE, ECE & CSE Branches)			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1521102	BSC	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		3	1	--		4	30	70
Mid Exam Duration: 90 min					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: <ul style="list-style-type: none"> • Understand Vector Calculus concepts and their applications. • Laplace transforms in engineering problems. • Understand Fourier series and apply them in solving problems. • Inculcate the concept of partial differential equations and its application to solve wave equation and heat equations. 								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Understand Vector Calculus concepts and analyze their applications in engineering problems.							
CO 2	Understand Laplace Transforms in engineering problems.							
CO 3	Apply Laplace Transforms in engineering problems.							
CO 4	Apply Fourier series in different problems.							
CO 5	Understand wave equation and heat equations and solve them by the method of separation of variables							

UNIT I

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.

UNIT II

Laplace transforms of standard functions – Properties of Laplace Transforms - Transforms of derivatives and integrals- Evaluation of integrals by Laplace transforms – Unit step function – Second shifting theorem – Dirac’s delta function. Laplace transform of periodic functions.

UNIT III

Convolution theorem. Inverse Laplace Transforms – Applications of Laplace transforms to ordinary differential equations.

UNIT IV

Fourier series: Determination of Fourier coefficients - Fourier series - Even and odd functions - Fourier series in an arbitrary interval - Functions having points of discontinuity- Half range Fourier sine and cosine expansions.

UNIT V

Partial Differential Equations: Formation of partial differential equations by eliminating arbitrary constants and arbitrary functions - Method of separation of variables. Solution of one dimensional wave equation - Solution of one dimensional heat equation.

Text Books:

1. Higher Engineering Mathematics, Dr. B.S Grewal, Khanna Publishers-42 edition.
2. Higher Engineering Mathematics, B.V.Ramana, Mc. Graw Hill Education (India) Pvt. Ltd.
3. Advanced Engineering Mathematics, Greenberg Michael D, Cengage Publishers.
4. Calculus and Analytic geometry, G.B. Thomas and R.L. Finney, Pearson, 9th Edition, Reprint, 2002.

Reference Books:

1. Advanced Engineering Mathematics, Erwin Kreyszig, Willey Publications, 9th edition- 2013
2. Engineering Mathematics Volume -1, Dr. D.S Chandra Sekharaiah, Prism Books Pvt. Ltd.
3. Advanced Engineering Mathematics by N. Bali, M Goyal, Firewall Media 7th edition.
4. Advanced Calculus, Widder V David, Pearson Publishers

Course Title	ENGINEERING GRAPHICS				B. Tech. ECE I Sem			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1503103	ED	L	T	P	C	Continuou s Internal Assessmen t	End Exam s	Total
		1	--	3				
Mid Exam Duration: 1Hr 30 Min					End Exam Duration: 3Hrs			
Course Objectives:								
<ul style="list-style-type: none"> This course develops the engineering imagination i.e., so essential to a successful design. Learning techniques of engineering drawing change the way one thinks about technical images. It is ideal to master the fundamentals of engineering drawing first and to later use these fundamentals for a particular application, such as computer aided drafting. Engineering Drawing is the language of engineers and by studying this course, engineering students will eventually be able to prepare drawings of various objects being used in technology. 								
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, planes 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

INTRODUCTION TO ENGINEERING DRAWING:

Principles of Engineering Graphics and their significance- Drawing instruments and their use- Conventions in Drawing- Lettering- BIS Conventions.

Curves used in Engineering Practice: (a) Conic sections –General methods only
(b) Cycloid, Epicycloids and Hypocycloid
(c) Involute.

UNIT-II

PROJECTION OF POINTS AND LINES: Principles of orthographic projection- conventions- First and Third angle projections. Projections of points, Lines inclined to one or both planes, Problems on projections, Finding True lengths & traces.

UNIT- III

PROJECTION OF PLANES: Projections of regular plane surfaces/figures, Projection of planes using auxiliary planes.

PROJECTIONS OF SOLIDS: Projections of regular solids inclined to one or both planes..

UNIT- IV

SECTIONS OF SOLIDS: Section planes and sectional views of right regular solids- Prism, Cylinder, Pyramid and Cone. True shape of sections

UNIT- V

ORTHOGRAPHIC PROJECTIONS: Conversion of isometric projections/views to Orthographic Views- Conventions.

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 Neil Phelps, "Manual of Engineering Drawing: British and International Standards", Butterworth Heinemann Inc, Fifth Edition.
4. Thomas E French, Charles John Vierck, Robert J. Foster, "Engineering Drawing and Graphic Technology", McGraw-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	ENGLISH-1					B. Tech. ECE I Sem		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1524104	HS	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		4	--	--				
Mid Exam Duration: 1Hr 30 Min					End Exam Duration: 3Hrs			
Course Objectives:								
<ul style="list-style-type: none"> To improve the language, proficiency of the students in English with an emphasis on LSRWS skills. To develop an awareness in the students about the significance of silent reading and comprehension. To equip the students to 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 enable students to express themselves fluently and appropriately in social and professional contexts. 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	Describe the classification of words, sentences and their usages in sentences.							
CO 2	Understand the difference between spoken and written English.							
CO 3	Analyze the rules in language for changing the form of sentences.							
CO 4	Illustrate the factors that influence grammar and vocabulary in speaking and writing							
CO 5	Classify the parts of speech, tenses and sentence structures							

UNIT – I

An Astrologer's day – R.K. Narayan
My struggle for an education – Booker T. Washington
Grammar – Identification and Interchange of parts of speech.

UNIT – II

Building A New State – Dr. A.P.J. Abdul Kalam
The Happy Prince – Oscar Wilde
Grammar – Reading comprehension

UNIT – III

The woodrose – Abburi Chayadevi
Mokshagundam Visveswaraiah – A Biography
Grammar – Vocabulary

UNIT – IV

Homi Jehangir Baba – A Biography
If Rudyard Kipling
Grammar – Transformation sentences

UNIT – V

Remedial Grammar

Text Books:

1. Glossary of Grammatical Terms – GeogreyLeech
2. Practical English Usage – MichalSwan
3. English Grammar and Composition - Wren andMartin
4. Advanced English Grammar & Composition – M.P. Bhatia
5. English Improvement Course –Dhillon

Course Title	PROGRAMMING IN C				B. Tech. ECE I Sem			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1505105	ED	L	T	P	C	Continuou s Internal Assessmen t	End Exam s	Total
		3	1	--		3	30	70
Mid Exam Duration: 1Hr 30 Min					End Exam Duration: 3Hrs			
Course Objectives:								
<ul style="list-style-type: none"> To understand the syntax and semantics of C programming language and other features of the language To learn logical skills for solving problems, implement them using C language. 								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Understand the basics of computer system and C programming.							
CO 2	Analyze a given problem and develop an algorithm to solve the problem.							
CO 3	Apply proper branching and loop constructs to solve a complex problem							
CO 4	Understand the concepts of arrays and strings to solve real time applications							
CO 5	Apply modular approaches for solving complex problems							
CO 6	Illustrate memory optimization for solving real world problems using structures and Unions							

UNIT I

Introduction to Computers: Computer Systems, Computing Environment, Computer Languages, Creating and Running Programs, System Developments, Algorithms, Flowcharts.

Introduction to the C Language : Introduction, C programs, Identifiers, Types, Variables, Constants, Input and Output, Programming Examples.

UNIT II

Structure of C program: Expressions, Precedence and Associativity, Evaluating Expressions, Type Conversion, Statements, Sample Programs.

Selections and Making Decisions: Logical Data and Operators, Two-way Selection, Multiway Selection.

UNIT III

Repetition: Concept of Loop, Pretest and Post-test Loops, Initialization and Updation, Event and Counter Controller Loop, Loops in C, Looping Applications

Functions: Introduction, User Defined Functions, Inter-Function Communication, Standard Functions, Scope, Programming Examples.

UNIT IV

Arrays: Introduction, Two Dimensional Arrays, Multi-Dimensional Arrays, Inter Function Communication, Array Applications, Exchange(Bubble) Sort, Binary Search, Linear Search.

Strings: String Concepts, C Strings, Sting Input/output Functions, Arrays of Strings, String Manipulation Functions, String/Data Conversion.

UNIT V

Enumerated, Structure, and Union Types: The Type Definition, Enumerated Types, Structure, Unions, Programming Applications.

Bitwise Operators: Exact Size Integer Types, Logical Bitwise Operators, Shift Operators, Mask, Introduction to Pointers and File management.

TEXT BOOKS

1. E. Balagurusamy, C Programming and Data structures, Fourth Edition, McGrawHill.
2. Rema Theraja, Programming in C, second edition, Oxford.
3. Fundamentals of Data Structures in C, Ellis Horowitz, Sartaj Sahni, 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 TEXT 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. Chenna Reddy, Computer Fundamentals and C Programming, Second Edition.

Course Title	Environmental Studies				B. Tech. EEE, ECE & CSE (I Sem) CE, ME (II Sem)			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1501106/ 1501206	HS	L	T	P	C	Continuou s Internal Assessmen t	End Exam s	Total
		4	0	0				
Mid Exam Duration:90 Min					End exam: 3 Hrs			
Course Objectives:								
<ul style="list-style-type: none"> To make the students to get awareness on importance of environment in our life. To understand the importance of protecting natural resources, ecosystems for future generations and pollution causes due to the day to day activities of human life to save earth from the inventions by the engineers. 								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Demonstrate the improper utilization of Natural resources by society.							
CO 2	Understand the interconnection of human dependence on this ecosystem.							
CO 3	Recall the concepts of biodiversity & gain knowledge on distribution at different levels.							
CO 4	Analyze the impact of environmental pollution on environment & solving environmental problems							
CO 5	Outline the management of environmental hazards and disasters and have a clear understanding on environmental concerns and follow sustainable developmental activities.							

UNIT I

MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES: Definition, Scope and Importance – Need for Public Awareness. **NATURAL RESOURCES :** Renewable and non-renewable resources – Natural resources and associated problems – (a) Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction – Mining, dams and other effects on forest and tribal people – (b) Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems – (c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – (d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. – (e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, Case studies;(f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification; Role of an individual in conservation of natural resources; equitable use of resources for sustainable lifestyles.

UNIT II

ECOSYSTEMS: Concept of an ecosystem. – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession – Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the following ecosystem:
(a)Forest ecosystem,(b)Grassland ecosystem,(c)Desert ecosystem,(d)Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

UNIT III

BIODIVERSITY AND ITS CONSERVATION: Introduction - Definition: genetic, species and ecosystem diversity – Bio-geographical classification of India – Value of biodiversity: consumptive use, Productive use, social, ethical, aesthetic and option values – Biodiversity at global, National and local levels – India as a mega-diversity nation – Hot-spots of biodiversity – Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT IV

ENVIRONMENTAL POLLUTION: Definition, Cause, effects and control measures of :(a)Air Pollution,(b)Water pollution,(c)Soil pollution,(d)Marine pollution,(e)Noise pollution,(f)Thermal pollution,(g)Nuclear hazards **SOLID WASTE MANAGEMENT:** Causes, effects and control measures of urban and industrial wastes – Role of an individual in prevention of pollution – Pollution case studies – Disaster management: floods, earthquake, cyclone and landslides.

UNIT V

SOCIAL ISSUES AND THE ENVIRONMENT: From Unsustainable to Sustainable development – Urban problems related to energy – Water conservation, rain water harvesting, watershed management – Resettlement and rehabilitation of people; its problems and concerns. Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies – Wasteland reclamation. – Consumerism and waste products. – Environment Protection Act. – Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act – Wildlife Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness.

HUMAN POPULATION AND THE ENVIRONMENT: Population growth, variation among nations- Population- explosion – Family Welfare Programme. – Environment and human health – Human Rights – Value Education – HIV/AIDS – Women and Child Welfare – Role of information Technology in Environment and human health – Case studies.

FIELD WORK: Visit to a local area to document environmental assets River/forest grassland/hill/mountain – Visit to a local polluted site-Urban/Rural/Industrial/Agricultural Study of common plants, insects, birds – Study of simple ecosystems-pond, river, hill slopes, etc.

Text Books:

1. Text book of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission, Universities Press.
2. Environmental studies by Benny Joseph, Mc, Graw Hill Publications.
3. Principles and a basic course of Environmental science for under graduate course by Kousic.
4. Text book of Environmental science and Technology by M. Anji Reddy,BS Publication.

Reference Books:

1. Environmental sciences and engineering – J. Glynn Henry and Gary W. Heinke – Printice hall of India Private limited.
2. Environmental Studies by Anindita Basak – Pearson education.
3. Introduction to Environmental engineering and science by Gilbert M. Masters and Wendell P. Ela - Printice hall of India Private limited.
4. Environmental Science, A Global Concerns, William P. Cunningham, Mary Ann Cunningham, Mc Graw Hill publications.

Course Title	PROGRAMMING IN C LAB				B. Tech. ECE I Sem			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1505107	ED	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		--	--	3				
Mid Exam Duration: 1Hr 30 Min					End Exam Duration: 3Hrs			
Course Objectives: <ul style="list-style-type: none"> To make the student learn C Programming language. To make the students solve problems, implement them using C language. <p style="text-align: center;">The Student is expected to solve at least 12 assignments from different concepts (every year 12 different experiments).</p>								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Analyze given problem and develop an algorithm							
CO 2	Implement Code and debug programs in C language using various constructs							
CO 3	Choose proper C language constructs to solve complex problems.							
CO 4	Organize and implement heterogeneous data in efficient memory utilization							

SAMPLE LIST OF EXPERIMENTS:

- Practice DOS/LINUX commands necessary for design of C programs.
- Write, edit, debug, compile and execute sample C programs to understand the programming environment.
- Write a C program to find the sum of the individual digits of a given number.
 - Write a C program to check whether a given number is a palindrome or not.
- Write a C program to generate & print first n terms of the Fibonacci sequence.
 - Write a C program to find the roots of a quadratic equation.
- Write a C program to compute the factorial of a given number.
 - Write a C program to generate all the prime numbers within a given range.
- Write a C program to generate PASCAL triangle.
 - Write a C program to find the GCD of two integers.
- Write a C program to evaluate the function Sin(x) as defined by the infinite series expression.

$$\sin(x) = \frac{x}{1!} - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \dots$$

- Write a C program to find the square root of a given number.

8.
 - a) Write a C program to find both smallest and largest number in a list of integers.
 - b) Write a C program to perform multiplication of two matrices.
9. Write a C program to read a matrix and perform the following operations.
 - i) Print transpose of a matrix.
 - ii) Removal of duplicates from an ordered array.
10. a) Write a C program to perform arithmetic operations using functions.
 - b) Write a C program to find the factorial of a given number using recursive function.
11. a) Write a C program to count the number of vowels, constants, blank spaces, digits and special characters in a given string.
 - b) Write a C program to check whether a given string is palindrome or not.
12. Write a C program to read two strings and perform the following operations without using built-in string library functions.
 - i) String length determination.
 - ii) Comparison of two strings.
 - iii) Concatenation of two strings.
 - iv) String reversing.
12. 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
1234	XXX	40	50	90	180	Distinction

Course Title	ENGINEERING WORKSHOP				B. Tech. ECE I Sem			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1599108	ED	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		--	--	3				
Mid Exam Duration: 1Hr 30 Min					End Exam Duration: 3Hrs			
Course Objectives: <ul style="list-style-type: none"> To equip the engineer with the knowledge of common and newer engineering materials as well as shop practices to fabricate, manufacture or work with materials. To introduce some common shop practices and on hand experience to appreciate the use of skill, tools, equipment and general practices to all the engineering students. To provide Technical training to the students on Productivity tools like Word processors, Spreadsheets, Presentations. To make the students know about the internal parts of a computer, assembling a computer from the parts, preparing a computer for use by installing the operating system. To learn about Networking of computers. 								
Course Outcomes: On successful completion of this course, the students 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	Experiment various basic House Wiring techniques such as connecting one lamp with one switch, connecting two lamps with one switch, connecting a fluorescent tube, Series wiring.							

PART A – Engineering Workshop

Objectives: The budding Engineer may turn out to be a technologist, scientist, entrepreneur, practitioner, consultant etc. There is a need to equip the engineer with the knowledge of common and newer engineering materials as well as shop practices to fabricate, manufacture or work with materials. Essentially he should know the labor involved, machinery or equipment necessary, time required to fabricate and also should be able to estimate the cost of the product or job work. Hence engineering work shop practice is included to introduce some common shop practices and on hand experience to appreciate the use of skill, tools, equipment and general practices to all the engineering students.

TRADES FOR EXERCISES:

- a. Carpentry shop– Two joints (exercises) involving tenon and mortising, groove and tongue: Making middle lap T joint, cross lap joint, mortise and tenon T joint, Bridle T joint from out of 300 x 40 x 25 mm soft wood stock
- b. Fitting shop– Two joints (exercises) from: square joint, V joint, half round joint or dove tail joint out of 100 x 50 x 5 mm M.S. stock
- c. Sheet metal shop– Two jobs (exercises) from: Tray, cylinder, hopper or funnel from out of 22 or 20 gauge G.I. sheet
- d. House-wiring– Two jobs (exercises) from: wiring for ceiling rose and two lamps (bulbs) with independent switch controls with or without looping, wiring for stair case lamp, wiring for a water pump with single phase starter.
- e. Foundry– Preparation of two moulds (exercises): for a single pattern and a double pattern.
- f. Welding – Preparation of two welds (exercises): single V butt joint, lap joint, double V butt joint or T fillet joint

TEXT BOOKS:

1. Work shop Manual / P.Kannaiah/ K.L.Narayana/ SciTechPublishers.
2. Engineering Practices Lab Manual, Jeyapoovan, Saravana Pandian, 4/eVikas
3. Dictionary of Mechanical Engineering, GHF Nayler, Jaico PublishingHouse

PART B – IT Workshop

Task 1: Learn about Computer: Identify the internal parts of a computer, and its peripherals.

Represent the same in the form of diagrams including Block diagram of a computer. Write specifications for each part of a computer including peripherals and specification of Desktop computer. Submit it in the form of a report.

Task 2: Assembling a Computer: Disassemble and assemble the PC back to working condition. Students should be able to trouble shoot the computer and identify working and non-working parts. Student should identify the problem correctly by various methods available (eg: beeps). Students should record the process of assembling and trouble shooting a computer.

Task 3: Install Operating System: Student should install Linux on the computer. Student may install another operating system (including proprietary software) and make the system dual boot or multi boot. Students should record the entire installation process. Students

should record the various features that are supported by the operating system(s) installed. They have to submit a report on it. Students should be able to access CD/DVD drives, write CD/DVDs, access pen drives, print files, etc. Students should install new application software and record the installation process.

Task 4: Networking: Students should connect two computers directly using a cable or wireless connectivity and share information. Students should connect two or more computers using switch/hub and share information. Crimping activity, logical configuration etc should be done by the student. The entire process has to be documented.

Task 5: Word Processor: Students should be able to create documents using the word processor tool. Some of the tasks that are to be performed are inserting and deleting the characters, words and lines, Alignment of the lines, Inserting header and Footer, changing the font, changing the color, including images and tables in the word file, making page setup, copy and paste block of text, images, tables, linking the images which are present in other directory, formatting paragraphs, spell checking, etc. Students should be able to prepare project cover pages, content sheet and chapter pages at the end of the task using the features studied. Students should submit a user manual of the word processor considered.

Task 6: Presentations: creating, opening, saving and running the presentations, Selecting the style for slides, formatting the slides with different fonts, colors, creating charts and tables, inserting and deleting text, graphics and animations, bulleting and numbering, hyperlinking, running the slide show, setting the timing for slide show. Students should submit a user manual of the Presentation tool considered.

TEXT BOOKS:

1. Introduction to Computers, Peter Norton, Mc GrawHill.
2. MOS study guide for word, Excel, Powerpoint & Outlook Exams”, Joan Lambert, Joyce Cox, PHI.
3. Introduction to Information Technology, IT Education Solutions limited, Pearson Education.
4. Networking your computers and devices, Rusen, PHI. Trouble shooting, Maintaining & Repairing PCs”, Bigelows, TMH

Course Title	ENGINEERING PHYSICS					B. Tech. ECE II Sem		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1522201	BS	L	T	P	C	Continuou s Internal Assessmen t	End Exam s	Total
		3	1	--				
Mid Exam Duration: 1Hr 30 Min					End Exam Duration: 3Hrs			
Course Objectives:								
<ul style="list-style-type: none"> To understand Physical Optics, Lasers And Fibre Optics. To learn Crystallography, Ultrasonics. To understand Magnetic Materials, Superconductors And Semiconductor Physics 								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Apply the knowledge of Sciences to solve engineering problems by using Interference and Diffraction techniques.							
CO 2	Understand the idea of Electronic materials & its applications in Engineering.							
CO 3	Describe Origin of bands in solids							
CO 4	Formulate the working elements of different lasers and estimate Laser operation parameters.							

UNIT I

PHYSICAL OPTICS, LASERS AND FIBER OPTICS

PHYSICAL OPTICS: Interference, Interference in thin films by reflection – Newton’s Rings-Fraunhofer diffraction due to single slit, double slit and diffraction grating.

LASERS: Introduction –characteristics of laser-Spontaneous and stimulated emission of radiation-Einstein’s coefficients-population inversion – Excitation mechanisms and optical resonator-Nd-YAG laser – He-Ne laser- Application of lasers.

FIBER OPTICS: Introduction-Construction and working principle of optical fiber-Numerical aperture and acceptance angle- Types of optical fibers- Black diagram of Optical fiber Communication system- Applications of optical fibers.

UNIT II

CRYSTALLOGRAPHY AND ULTRASONICS:

CRYSTALLOGRAPHY: Introduction –Space lattice –unit Cell- lattice parameters- Bravis lattice – Crystal systems- Packing fractions of SC, BCC and FCC – Directions and planes in Crystals – Miller indices – Inter Planar spacing in cubic crystal – X-ray diffraction – Bragg’s law and Powder method.

ULTRASONICS: Introduction- Production of Ultrasonic’s by piezoelectric method- Properties and detection- Applications in non –destructive testing.

UNIT III

QUANTUM MECHANICS AND ELECTRON THEORY:

QUANTUM MECHANICS: Introduction to Matter waves – de-Broglie hypothesis principle – Schrodinger's time independent wave equation – Physical Significance of wave function – Particle in one dimensional infinite potential well.

ELECTRON THEORY: Classical free electron theory – Sources of electrical resistance – Equation for electrical conductivity – Quantum free electron theory – Fermi-Dirac distribution - Kronig-Penny model (qualitative) – Origin of bands in solids – Classification of solids in to Conductors, Semiconductors and Insulators.

UNIT IV

ENGINEERING MATERIALS:

MAGNETIC MATERIALS: Introduction and basic definitions- Origin of Magnetic moments- Bohr magneton- Classification of magnetic materials into Dia, Para, Ferro, Antiferro and Ferri magnetic materials- Hysteresis loop- Soft and hard magnetic materials and Applications of magnetic materials.

SUPERCONDUCTORS: Introduction- effect of magnetic field-Meissner effect- Type I and Type II Superconductors- Flux quantization- London penetration depth- ac and dc Josephson effects- BCS theory(Qualitative)- Applications of Superconductors.

UNIT V

PHYSICS OF SEMICONDUCTORS AND NANO MATERIALS:

SEMICONDUCTOR PHYSICS: Introduction- Intrinsic and Extrinsic Semiconductors- Drift and Diffusion currents and Einstein's equation- Hall effect- Direct and Indirect band gap Semiconductors- Formation of p-n junction.

NANOMATERIALS: Introduction- Significance of Nanoscale and types of Nanomaterials- Physical properties: Optical, Thermal, Mechanical and Magnetic properties- Synthesis of Nanomaterials: Ball mill, Chemical Vapour Deposition and Sol-gel methods-Applications of nanomaterials.

Text Books:

1. Engineering Physics by K. Thygarajan, Mac Graw – Hill Publishing Co. NewDelhi.
2. Engineering Physics by P.K. Palanisamy, ScitechPublications.
3. Engineering Physics by S. Mani Naidu, Pearsonedition.
4. EngineeringPhysics-SanjayD.Jain,D.SahasrambudheandGirishUniversityPress,IEdition,2009

Reference Books:

1. EngineeringPhysics–DKPandey,S. Chaturvedi,CengageLearning,IEdition,2012
2. Engineeringphysics–M.N.AvadhanuluandP.G.KshirSagar,ChandandCo,RevisedEdition,2013.
3. Solid State Physics – A.J. Dekkar, McMillan Publishers, Latest edition,2012.
4. EngineeringPhysics–GaurandGuptaDhanapati,RaiPublishers,7 Edition,1992.
5. TextbookofNanoscienceandNanotechnology:BSMurthy,P.Shankar,BaldevRajBBRath,James Murday, University Press, I Edition,2012.

Course Title	MATHEMATICS – II				B. Tech. I Sem (Common to EEE, ECE & CSE Branches)			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1521102	BSC	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		3	1	--		4	30	70
Mid Exam Duration: 90 min					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: <ul style="list-style-type: none"> • Understand Vector Calculus concepts and their applications. • Laplace transforms in engineering problems. • Understand Fourier series and apply them in solving problems. • Inculcate the concept of partial differential equations and its application to solve wave equation and heat equations. 								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Understand Vector Calculus concepts and analyze their applications in engineering problems.							
CO 2	Understand Laplace Transforms in engineering problems.							
CO 3	Apply Laplace Transforms in engineering problems.							
CO 4	Apply Fourier series in different problems.							
CO 5	Understand wave equation and heat equations and solve them by the method of separation of variables							

UNIT I

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.

UNIT II

Laplace transforms of standard functions – Properties of Laplace Transforms - Transforms of derivatives and integrals- Evaluation of integrals by Laplace transforms – Unit step function – Second shifting theorem – Dirac’s delta function. Laplace transform of periodic functions.

UNIT III

Convolution theorem. Inverse Laplace Transforms – Applications of Laplace transforms to ordinary differential equations.

UNIT IV

Fourier series: Determination of Fourier coefficients - Fourier series - Even and odd functions - Fourier series in an arbitrary interval - Functions having points of discontinuity- Half range Fourier sine and cosine expansions.

UNIT V

Partial Differential Equations: Formation of partial differential equations by eliminating arbitrary constants and arbitrary functions - Method of separation of variables. Solution of one dimensional wave equation - Solution of one dimensional heat equation.

Text Books:

1. Higher Engineering Mathematics, Dr. B.S Grewal, Khanna Publishers-42 edition.
2. Higher Engineering Mathematics, B.V.Ramana, Mc. Graw Hill Education (India) Pvt. Ltd.
3. Advanced Engineering Mathematics, Greenberg Michael D, Cengage Publishers.
4. Calculus and Analytic geometry, G.B. Thomas and R.L. Finney, Pearson, 9th Edition, Reprint, 2002.

Reference Books:

1. Advanced Engineering Mathematics, Erwin Kreyszig, Willey Publications, 9th edition- 2013
2. Engineering Mathematics Volume -1, Dr. D.S Chandra Sekharaiah, Prism Books Pvt. Ltd.
3. Advanced Engineering Mathematics by N. Bali, M Goyal, Firewall Media 7th edition.
4. Advanced Calculus, Widder V David, Pearson Publishers

Course Title	Engineering Chemistry				B. Tech. ECE & CSE (II Sem)			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1523103/ 1523203	BS	L	T	P	C	Continuou s Internal Assessmen t	End Exam s	Total
		3	1	0				
Mid Exam Duration: 90 Min					End Exam Duration: 3Hrs			
Course Objectives:								
<ul style="list-style-type: none"> • 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. 								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Recall differences between hard and soft water, treatment methods & disadvantages of using hard water domestically and industrially.							
CO 2	Analyze the industrial based polymers, various engineering materials.							
CO 3	Understand the electrochemical sources of energy and corrosion.							
CO 4	Explain the synthesis of different types of fuels, mechanism of lubrication & their properties							
CO 5	Illustrate the principles of Green chemistry & different types of Photoluminescence process							

UNIT.I

Water: Sources of water, types of impurities in water. Hardness of water: Causes, expression of hardness - units - Types of hardness-Temporary & permanent hardness of water. Disadvantages of hard water, Methods of treatment of water for domestic purpose. Analysis of water : Hardness of water by EDTA method, Estimation of Dissolved oxygen by Winkler's method Numerical problems.

Boiler troubles - Scale & Sludge formation, caustic embrittlement, Boiler corrosion, priming & foaming. Softening of water -Internal Treatment: phosphate, colloidal, calgon, carbonate and sodium aluminate treatment, External treatment : Zeolite, Ion exchange process. Reverse osmosis, electro dialysis.

UNIT II

Polymers: Introduction, Types of Polymerization, Mechanism (chain growth & Step growth).
Plastics: Thermoplastic resins & Thermo set resins. Compounding of plastics, Preparation, properties, engineering applications of polyethylene, Bakelite, Nylon, Teflon. Elastomers-Natural rubber, vulcanization, Compounding of rubber,
Synthetic Rubbers :Buna-S, Butyl rubber and Thiokol Rubbers.
Inorganic Polymers : Basic introduction, Preparation, properties and engineering applications of Silicones, Polyphospazins(-(R)2-P=N-)

UNIT III

Electrochemistry: Basic concepts for construction of Electrochemical cells, Types of cells: Concentration cells, Galvanic cells. Electrochemical Series. Batteries- Primary (Laclanche cell) and Secondary Batteries (Lead acid cell) .Fuel cells-H₂-O₂fuel cell and methanol- oxygen fuel cells.

Corrosion- Introduction, Types and Mechanism of Corrosion(Wet and Dry corrosion), factors influence corrosion, Control of Corrosion- Cathodic Protection(Sacrificial anodic protection & impressed current cathodic protection). Basic principles of Electroplating, Electroless plating.

UNIT IV

Fuel technology:

Fuels: Classification, Characteristics of good fuel. Solid fuels: Manufacture of Metallurgical coke by Otto Hoffmann's by product oven process. Liquid fuels – petroleum crude - refining of petroleum. Synthetic petrol: Bergius and Fischer Tropsech's process, Calorific value of fuels: HCV, LCV, determination of Calorific value of solid fuels(Bomb calorimetry).

Lubricants: Functions of lubricant, mechanism of lubrication(thick film, thin film& extreme pressure lubrication). Properties of lubricants: Viscosity, Flash & fire point,Cloud and pour point, Aniline point.

UNIT V

Advanced Chemistry:

Green Chemistry: Introduction , Significance of green chemistry, 12 principles of Green chemistry. .

Photo Chemistry: Introduction, Fluorescence, Phosphorescence, Luminiscent compounds, Solar cells

Catalysis: Introduction, Types of Catalysis (Homogenous& Heterogenous catalysis) Action of catalyst (Catalytic promoters, Catalytic inhibitor and catalytic poisons) and applications of catalyst.

Text Books:

1. A textbook of Engineering chemistry by Shashi Chawla, Dhanpat Rai & Co publications
2. Atkins' Physical Chemistry, Peter Atkins, Julio de Paula and James Keeler, Oxford University Press, 2010.
3. Textbook of Polymer Science, Third Edition, Fred W. Billi Meyer, TR, A Wiley-Inter Science Publications
4. An Introduction to Electrochemistry, Glasstone, Arihant Publications.

Reference Books:

1. Textbook of Engineering Chemistry, Jain and Jain, DhanpatRai& Co publications, 2013
2. New Concise Inorganic Chemistry, 5th Edition, J. D. Lee, Oxford University Press, 2008..
3. Advanced Inorganic Chemistry, Cotton F Albert, Wilkinson Geoffrey, Prism Publications
4. Water Technology, 2nd Edition, N.F. Gray, Elsevier publications, 2005.
5. Fuels & Fuel- Additives, S.P.Srivastava , Jeno Hancsok, Willey Publications.
6. Handbook of Green chemistry and technology, James H. Clark, Duncan J. MacQuarrie, Blackwell, Abingdon,2002

Course Title	ENGLISH-2					B. Tech. ECE II Sem		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1524204	HS	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		4	--	--				
Mid Exam Duration: 1Hr 30 Min					End Exam Duration: 3Hrs			
Course Objectives: <ul style="list-style-type: none"> 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 to 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 enable students to express themselves fluently and appropriately in social and professional contexts. 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	Express themselves fluently and appropriately in social and professional contexts.							
CO 2	Understand academic subjects with greater facility through theoretical and practical components of the syllabus.							
CO 3	Apply communication skills in formal and informal situations.							
CO 4	Express themselves fluently and appropriately in social and professional contexts.							
CO 5	Apply writing skills for the preparation of document.							

UNIT I

Phonetics and Transcription
Resume and Emails

UNIT II

Dialogue Writing
Speech Making

UNIT III

Paragraph Writing
Precis Writing

UNIT IV

Group Discussion
Interviews

UNIT V

Letter writing

Technical Report Writing

Reference Books

1. Effective Technical Communication – M. Ashraf Rizvi, TataMcGraw-Hill
2. Speaking English Effectively – Krishna Mohan & N.P. Sing, MacmillanPublication
3. ATextBookofEnglishPhoneticsforIndianStudents–T.BalaSubramanian,TrinityPress.
4. Communication with Confidence – Puspalatha, OxfordPublication
5. An approach to Communication Skills – DhanRajan
6. Business Correspondence and Report Writing – R.C. Sharma & Krishnamohan

Course Title	ELECTRICAL CIRCUITS					B. Tech. ECE II Sem		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1502205	PJ	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		3	1	--				
Mid Exam Duration: 1Hr 30 Min					End Exam Duration: 3Hrs			
Course Objectives:								
<ul style="list-style-type: none"> This course introduces the basic concepts of circuit analysis which is the foundation for all subjects of the Electrical Engineering discipline. The emphasis of this course is laid on the basic analysis of circuits which includes single phase circuits, magnetic circuits, theorems, transient analysis and network topology. 								
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	Describe working principle, operation and construction of DC machines, 3- ϕ induction motors and 1- ϕ transformers							
CO 4	Solve the problems on EMF, Current, Torque, Regulation and Efficiency of DC machines, 3- ϕ induction motor and 1- ϕ transformer.							

UNIT – I

Introduction to Electrical Circuits: circuit concepts, classification of network elements, voltage & current sources; independent & dependent sources, source transformation techniques, R-L-C Parameters, Voltage-Current relationship for passive elements. Kirchhoff's laws, network reduction techniques – series, parallel, series parallel, Y/-Transformations, Mesh and Nodal analysis for D.C. excitation.

UNIT – II

Single Phase AC Circuits: RMS, Average values, form factor, peak factor for different periodic waveforms, phase, phase difference, phasor notation, J-notation. Concept of Reactance, Impedance, Susceptance, and Admittance, Active & Reactive power, Power factor, power triangle.

Response of R, L & C elements for sinusoidal excitation, steady state analysis of RL, RC and R-L-C (Series, parallel, series parallel) Circuits for sinusoidal excitations, phasor diagram. Steady state analysis of A.C. Circuits using mesh and nodal analysis.

UNIT – III

Series and Parallel resonance: Resonant frequency, Half Power frequency, Band width, Q-Factor, Relation between them, problems.

Locus Diagrams: Impedance & admittance locus diagrams of RL & RC Series circuits and two branch parallel circuits.

UNIT – IV

Magnetic Circuits: Concept of self & mutual inductances, Dot Convention, Problems, Coefficient of coupling, Composite Magnetic circuit, analysis of Series and Parallel Magnetic Circuits, Duality and dual Circuits, problems.

UNIT – V

Network Topology: Definition – Graph, tree, Co-tree, Incidence Matrix, Tie-Set & Cut – Set Matrices for Planar networks, Formulation of equilibrium equations based on graph theory, problems.

Text Books

1. Network Analysis – Van Valkenburg - 3rd edition, PHI.
2. Engineering Circuit Analysis – William H. Hayt – Jack E. Kimmerly – TMH
3. Fundamentals of Electric Circuits – Charles's, Alexander & Mathew N.O. Sadiku, TMH 3rd Edition.
4. Electrical Circuits – N. Sreenivasulu – Reem Publications

References

1. Circuits & Networks – A. Sudhakar, Shayammohan. S. Pillai, 4th Edition – TMH.
2. Theory and Problems of Electrical Circuits – Joseph A. Edminister – Schaum Series, 1st Edition – TMH.
3. Network Analysis – N C Jagan & C. Lakshmi Narayana, BSP

Course Title	HUMAN VALUES AND PROFESSIONAL ETHICS				B. Tech. ECE II Sem			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1525206	HS	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		4	--	--	3	30	70	100
Mid Exam Duration: 1Hr 30 Min					End Exam Duration: 3Hrs			
Course Objectives:								
<ul style="list-style-type: none"> This course deals with professional ethics which includes moral issues and virtues, social responsibilities of an engineer, right qualities of moral leadership. 								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Deal with professional ethics which includes moral issues and virtues.							
CO 2	Describe social responsibilities of an engineer.							
CO 3	Build right qualities of moral leadership.							

UNIT I

ENGINEERING ETHICS

Senses of Engineering Ethics – Variety of Moral issues – Types of inquiry – Moral Dilemmas – Moral Autonomy – Kohlberg’s Theory – Consensus and Controversy – Professions and Professionalism – Professional ideals and virtues

UNIT II

ENGINEERING AS SOCIAL EXPERIMENTATION

Engineering as experimentation – Engineers as Responsible Experimenters – Research Ethics – Codes of Ethics – Industrial Standards – A Balanced Outlook on Law – The Challenger Case Study

UNIT III

ENGINEER’S RESPONSIBILITY FOR SAFETY

Safety and Risk – Assessment of Safety and Risk – Risk benefit Analysis – Reducing Risk – The Government Regulator’s Approach to Risk – Chernobyl Case and Bhopal Case studies.

UNIT IV

RESPONSIBILITIES AND RIGHTS

Collegiality and Loyalty – Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of interest – Occupational Crime – Professional Rights – Employee Rights – Intellectual Property (IPR) – Discrimination.

UNIT V

GLOBAL ISSUES

Multinational Corporations – Business Ethics – Environmental Ethics – Computer Ethics – Role in Technological Development – Weapons Development – Engineers as Managers – Consulting Engineers – Engineers as Expert Witnesses and Advisors – Honesty – Leadership – Sample Code of conduct.

TEXT BOOKS:

1. MikemartinandRolandSchinzinger.“EthicsinEngineering”,McGrowHill,NewYork2005
2. CharlesEHarris.MichaelSPritchardandMichaelJRabins.“EngineeringEthics–Concepts and Cases”, Thompson Learning2000.
3. CharlesDFleddermann,“EngineeringEthics”,PrenticeHall,NewMexico,1999.

REFERENCE BOOKS:

1. JohnRBaatright.“EthicsandtheConductofBusiness”,PearsonEducation2003.
2. Edmund G Seeabauer and Robert L Barry, “Fundamentals of Ethics for Scientists and Engineers”, Oxford University press2001.
3. Prof. (Col) P S Bajaj and Dr. Raj Agrawal, “ Business Ethics – An Indian Perspective”, Biztantra, New Delhi,2004.
4. DavidErmannandMicheleSShauf,“Computers,EthicsandSociety”,OxfordUniversityPress,2003

Course Title	ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB				B. Tech. ECE II Sem			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1524207	HS	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		--	--	3	2	50	50	100
Mid Exam Duration: 1Hr 30 Min					End Exam Duration: 3Hrs			
Course Objectives:								
<ul style="list-style-type: none"> 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 to 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 enable students to express themselves fluently and appropriately in social and professional contexts. 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	Describe objects, places and persons.							
CO 2	Understand the listening process and answer the questions related to it.							
CO 3	Analyze phonetics with examples							
CO 4	Illustrate different modes of communication skills							
CO 5	Classify LSRW skills							

LANGUAGE LAB

1. Phonetics
2. Situational Dialogues
3. Telephonic Skills
4. Describing Objects / Situation / People and Places
5. Information Transfer
6. Idioms

COMMUNICATION LAB

1. Introducing oneself
2. JAM Session
3. Extempore / Elocution
4. Role-play
5. Debate
6. Group Discussion

Suggested Software: Walden & K-Van Solutions

Course Title	PHYSICS AND CHEMISTRY LAB				B. Tech. ECE II Sem			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1599208	BS	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		--	--	3	2	50	50	100
Mid Exam Duration: 1Hr 30 Min					End Exam Duration: 3Hrs			
Course Objectives:								
<ul style="list-style-type: none"> To explore the application of interference and diffraction by doing concerned experiments. To understand the role of laser in various applications. To know the significance of fiber parameters in communication application. To understand the concept of energy gap, Hall effect, B-H curve, X-ray diffraction 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 of the application of interference, diffraction phenomena along with laser							
CO 2	Support the 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	Estimate rate constants of reactions from concentration of reactants/products as a function of time.							
CO 5	Measure molecular/system properties such as surface tension, viscosity, conductance of solutions, redox potentials, chloride content of water, etc.							

PART A – ENGINEERING PHYSIC LAB

LIST OF EXPERIMENTS

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

- Determination of wavelengths of various colours of mercury spectrum using diffraction grating in normal incidence method.
- Determination of dispersive power of the prism.
- Determination of thickness of thin object by wedge method.
- Determination of radius of curvature of lens by Newton's Rings.
- Laser : Determination of wavelength using diffraction grating.
- Determination of Numerical aperture and acceptance angle of an optical fiber.
- Energy gap of a semiconductor using p-n junction diode.
- Hall effect: Determination of mobility of charge carriers in semiconductor
- Hysteresis: B-H curve
- Magnetic field along the axis of a current carrying coil – Stewart and Gee's method.
- Determination of crystallite size using X-ray pattern (powder) by using Debye-Scherrer method.

12. Synthesis of nanomaterial by any convenient method.

PART B – ENGINEERING CHEMISTRY LAB

OBJECTIVES

- The objective of the course is that the student will have exposure to various experimental skills which is very essential for an Engineering student.
- The experiments are selected from various areas of Chemistry like Conductometry, Polymers, Energy sources and water.
- Also the student is exposed to various tools like Analytical Balance, pH meter, Viscometer, Bomb calorimeter, etc.

LIST OF EXPERIMENTS

Introduction to Lab-Analytical Balance, Molarity, Normality, Calculations, Glass wares.

1. Determination of total hardness of water by EDTA method.
2. Estimation of Dissolved Oxygen present in given water sample by Winkler's method
3. Determination of viscosity of oils by Redwood viscometer I.
4. Determination of viscosity of oils by Redwood viscometer II.
5. Determination of calorific value of fuel sample using Bomb Calorimetry.
6. Estimation of Iron by Diphenyl amine indicator.
7. Determination of Copper by EDTA method.
8. Conductometric titrations of Strong acid Vs Strong base ((NaOH).
9. Colorimetric estimation of Manganese.
10. pH meter calibration and measurement of pH of water and various other samples.

REFERENCES

1. Vogel's Text book of Quantitative Chemical Analysis, J. Mendham et. al., Pearson Education, Sixth Edition, 2012.
2. Laboratory manual on Engineering Chemistry, Anupama Rajput, Dhanpat Rai & Co Publications.
3. Essentials of Experimental Engineering Chemistry, Shashichawla, Dhanpat Rai & Co Publications.