REGULATIONS - 2015

DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING

CURRICULUM & SYLLABUS - FIRST YEAR

B.E. – ELECTRONICS AND COMMUNICATION ENGINEERING
COLLEGE VISION

- Transforming lives through quality Education and research with human values.

COLLEGE MISSION

- To maintain excellent infrastructure and highly qualified and dedicated faculty.

- To provide a conducive learning environment with an ambience of humanity, wisdom, creativity and team spirit.

- To promote the values of ethical behavior and commitment to the society.

- To partner with academic, industrial and government entities to attain collaborative research.
VISION

- To produce communication engineers capable of generating a knowledge economy with social responsibility

MISSION

- To impart high quality education with ethical behavior.
- To equip the students compatible with recent trends in Electronic industries.
- To develop leadership qualities with humanity, wisdom, creativity and team spirit.
- To provide a passionate environment for continual learning.

Program Educational Objectives (PEO)

- Graduate will have successful technical career in core and related fields.
- Graduates will pursue higher education and work in Research and Development for solving real world problems.
- Graduates will have leadership qualities with social consciousness and ethics.
Program Outcomes (PO)

1. An ability to apply knowledge of mathematics, science, engineering and technology to solve complex Electronics and communication Engineering problems.

2. An ability to identify, formulate and analyze engineering problems using knowledge of Basic Mathematics and Engineering sciences.

3. An ability to provide solution and to design Electronics and Communication systems that meets out the social needs.

4. An ability to investigate the problems in an Electronics and Communication systems and rectifying it.

5. An ability to use latest hardware and software tools to solve complex engineering problems.

6. An ability to gain knowledge on contemporary issues which influence engineering design.

7. Awareness on society and environment to have sustainable solution for Electronics and Communication engineering problems.

8. An ability to demonstrate understanding of professional and ethical responsibilities.

9. An ability to work efficiently as an individual and in multidisciplinary teams.

10. An ability to communicate effectively and efficiently both in verbal and written form.

11. An ability to develop confidence for self education and understanding the value for life-long learning.

12. Able to implement Electronic system projects for real world applications.
# B.E. – ELECTRONICS AND COMMUNICATION ENGINEERING

## REGULATIONS – 2015

FIRST YEAR CURRICULUM AND SYLLABUS

## SEMESTER – I

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Course Category</th>
<th>Course Code</th>
<th>Course Title</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
<th>Question pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MAC</td>
<td>15SH11C</td>
<td>Technical English*</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>B</td>
</tr>
<tr>
<td>2</td>
<td>CFC</td>
<td>15SH12C</td>
<td>Mathematical Foundations for Engineers*</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>4</td>
<td>B</td>
</tr>
<tr>
<td>3</td>
<td>CFC</td>
<td>15SH13C</td>
<td>Engineering Physics*</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>B</td>
</tr>
<tr>
<td>4</td>
<td>CFC</td>
<td>15SH14C</td>
<td>Engineering Chemistry*</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>B</td>
</tr>
<tr>
<td>5</td>
<td>CFC</td>
<td>15SH15C</td>
<td>Introduction to Engineering*</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>A</td>
</tr>
<tr>
<td>6</td>
<td>CFC</td>
<td>15SH16C</td>
<td>Engineering Graphics*</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>A</td>
</tr>
</tbody>
</table>

### PRACTICAL COURSES

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Course Category</th>
<th>Course Code</th>
<th>Course Title</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>CFC</td>
<td>15SH17C</td>
<td>Engineering Physics and Engineering Chemistry Laboratory*</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>CFC</td>
<td>15SH18C</td>
<td>Engineering Practice Laboratory*</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

**Total** 16 2 6 20

## SEMESTER – II

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Course Category</th>
<th>Course Code</th>
<th>Course Title</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
<th>Question pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MAC</td>
<td>15EC21C</td>
<td>Professional English*</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>B</td>
</tr>
<tr>
<td>2</td>
<td>SFC</td>
<td>15EC22C</td>
<td>Calculus and Laplace Transforms</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>4</td>
<td>B</td>
</tr>
<tr>
<td>3</td>
<td>SFC</td>
<td>15EC23C</td>
<td>Semiconductor Physics#</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>B</td>
</tr>
<tr>
<td>4</td>
<td>SFC</td>
<td>15EC24C</td>
<td>Circuit Analysis</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>4</td>
<td>B</td>
</tr>
<tr>
<td>5</td>
<td>CFC</td>
<td>15EC25C</td>
<td>C Programming for Engineers*</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>B</td>
</tr>
<tr>
<td>6</td>
<td>MAC</td>
<td>15EC26C</td>
<td>Environmental Science and Engineering*</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>A</td>
</tr>
</tbody>
</table>

### PRACTICAL COURSES

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Course Category</th>
<th>Course Code</th>
<th>Course Title</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>SFC</td>
<td>15EC27C</td>
<td>Semiconductor Physics and Environmental Chemistry Laboratory#</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>CFC</td>
<td>15EC28C</td>
<td>C Programming Laboratory*</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>SFC</td>
<td>15EC29C</td>
<td>Circuits and Devices Laboratory</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

**Total** 18 4 6 23

---

*MAC - Mandatory Course, CFC - Common Foundation Course, SFC - Specific Foundation Course, PCC – Programme Core Course, XEC - X Stands for P or O (PEC – Programme Elective Course, OEC – Open Elective Course)

*Common to all B.E. / B.Tech., Programmes, #Common to ECE and EEE*
<table>
<thead>
<tr>
<th>Question pattern</th>
<th>1 mark</th>
<th>2 marks</th>
<th>4 marks</th>
<th>10 marks</th>
<th>12 marks</th>
<th>16 marks</th>
<th>20 marks</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1 Qn Compulsory &amp; 4 Qns (either or type)</td>
<td>-</td>
<td>100</td>
</tr>
<tr>
<td>B</td>
<td>-</td>
<td>10</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1 Qn Compulsory &amp; 4 Qns (either or type)</td>
<td>-</td>
<td>100</td>
</tr>
<tr>
<td>C</td>
<td>10</td>
<td>-</td>
<td>10 out of 12</td>
<td>1 Qn Compulsory &amp; 4 Qns (either or type)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>100</td>
</tr>
<tr>
<td>D</td>
<td>10</td>
<td>10</td>
<td>5 out of 6</td>
<td>1 Qn Compulsory &amp; 4 Qns (either or type)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>100</td>
</tr>
<tr>
<td>E</td>
<td>-</td>
<td>10</td>
<td>5 out of 6</td>
<td>1 Qn Compulsory &amp; 4 Qns (either or type)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>100</td>
</tr>
</tbody>
</table>

**FORMAT FOR COURSE CODE**

<table>
<thead>
<tr>
<th>1</th>
<th>5</th>
<th>E</th>
<th>C</th>
<th>2</th>
<th>3</th>
<th>C</th>
</tr>
</thead>
</table>

Compulsory Course
Course Number
Semester Number
Branch Name
Regulations 2015
15SH11C TECHNICAL ENGLISH (Common to all B.E. / B.Tech. Degree Programmes) 3 0 0 3

COURSE OUTCOMES
Upon completion of this course, the students will be able to
CO1: acquire the basics of English communication skills. (K3)
CO2: apply the basic language skills to understand various aspects of technical writing. (K3)
CO3: understand main ideas, specific details and implied meaning while listening and develop the factual & imaginative information. (S4)
CO4: coordinate and communicate in a wide range of situation. (S4)
CO5: integrate and apply the acquired skills in real life situation. (S4)

UNIT I                                                      9
Parts of Speech - Sentence Structure (SV/SVO/SVC/SVIDO) -Identifying the kinds of sentences (Statement, Interrogative, Imperative, Exclamatory & Negative) -Informal writing (Diary writing & letter to friend/ parent/siblings) - Self Introduction -Listening for general information.

UNIT II                          9
Transformation of words into different grammatical forms- Converting one kind of sentence into another sentence (Statement, Interrogative, Imperative, Exclamatory & Negative) - Technical Vocabulary - Tense Usage (Present tense- Past tense - Future tense - Writing passages in all tenses) -Letter writing (Permission letter & Requisition letter) - Listening for specific information.

UNIT III                               9
Personality Adjective - Concord - Letter Writing: Invitation / Acceptance letters - Itinerary Writing (with valued points/ situation) - Phonetics (Vowels - Consonants - Diphthongs) - Listening and filling up the information - Process Description (with valued points).

UNIT IV                            9
IF Conditionals - British & American Vocabulary - Letter Writing (Declining / Thanking letters) - Email writing (with valued points) - Instruction Writing - Listening and giving opinion on the pictures.

UNIT V                 9
Reading comprehension - Error Spotting (Article, Preposition, Modals and Concord) - Presenting article based on newspaper reading- Situational Conversation - Listening and writing dialogues – Checklists.

L: 45 TOTAL: 45 PERIODS

Suggested Activity: Each student should read the suggested fiction for oral assignment

TEXT BOOKS

REFERENCES

Listening files: Audio files from net sources, Softwares: ODLL, Globerena.
15SH12C      MATHEMATICAL FOUNDATIONS FOR ENGINEERS
(Common to all B.E / B.Tech. Degree Programmes)      L  T  P  C
3  2  0  4

COURSE OUTCOMES
Upon completion of this course, the students will be able to
CO 1: make use of orthogonal transformation. (K3)
CO 2: use the basic concepts of three dimensional geometry in engineering. (K2)
CO 3: obtain maxima and minima of real valued functions. (K3)
CO 4: solve ordinary differential equations. (K3)
CO 5: solve partial differential equations. (K3)

UNIT I  MATRICES
Characteristic equation – Eigen values and Eigen vectors of a real matrix – Independency and
dependency of Eigen vectors – Properties of Eigen values and Eigen vectors (excluding proofs) -
Diagonalisation of a matrix by orthogonal transformation- Quadratic forms – Reduction of quadratic
form to canonical form by orthogonal transformation and its nature.

UNIT II  THREE DIMENSIONAL ANALYTICAL GEOMETRY
Direction cosines and Direction ratios - Planes and Lines - Equations of plane and line -
Intersection of two planes - Shortest distance between two lines - Equation of a sphere - Plane
section of a sphere - Tangent Plane - Orthogonal spheres.

UNIT III  FUNCTIONS OF SEVERAL VARIABLES
Euler’s theorem on homogeneous functions of two variables - Taylor’s Series - Jacobians -
Maxima and Minima - Constrained Maxima and Minima by the method of Lagrange multipliers.

UNIT IV  ORDINARY DIFFERENTIAL EQUATIONS
Solutions of higher order linear differential equations with constant coefficients - Cauchy’s and
Legendre’s linear equations - Solutions of simultaneous first order linear equations with constant
coefficients - Method of variation of parameters.

UNIT V  PARTIAL DIFFERENTIAL EQUATIONS
Formation of partial differential equations - Lagrange’s linear equations - Solutions of standard
types of first order partial differential equations - Solutions of homogeneous linear partial
differential equations of second and higher order with constant coefficients.

L: 45 T: 30 TOTAL: 75 PERIODS

TEXT BOOKS
   2012.

REFERENCES
   Distributors, New Delhi, 2005.
5. Anthony Croft, Robert Davison, Martin Hargreaves James Flint, “Engineering Mathematics:
   A Foundation for Electronic, Electrical, Communications and System Engineers”, 4th
15SH13C ENGINEERING PHYSICS (Common to all B.E / B.Tech. Degree Programmes) 3 0 0 3

COURSE OUTCOMES

Upon completion of this course, the students will be able to

CO 1: summarize the properties and structures of solids. (K2)
CO 2: define the principles of acoustics and ultrasonics and apply the ultrasonic methods for industrial and medical field. (K1)
CO 3: choose the appropriate Laser technique for industrial and medical applications. (K3)
CO 4: describe the different types, fabrication, losses of optical fibers and their applications in communication and instrumentation,(K1)
CO 5: explain the physical properties of photons & electrons and their applications in different electron microscopes,(K2)

UNIT I PROPERTIES OF MATTER AND CRYSTAL PHYSICS 9
Hooke’s law - Types of moduli of elasticity - Determination of Rigidity modulus and Young’s modulus - I shaped Girders.
Miller indices – d spacing - Characteristics of SC, BCC, FCC and HCP structures.

UNIT II ACOUSTICS AND ULTRASONICS 9
Ultrasonics: Production - magnetostriction generator - piezoelectric generator, Properties - Cavitations - Velocity measurement - acoustic grating, Industrial applications - Medical application - Sonograms.

UNIT III LASER SYSTEM AND APPLICATIONS 9

UNIT IV FIBER OPTICS AND ITS APPLICATIONS 9
Numerical aperture and Acceptance angle - Types of optical fibers - Double crucible technique – Splicing - Loss in optical fiber - Fiber optical communication system - Applications - Fiber optic sensors - Endoscope.

UNIT V QUANTUM PHYSICS 9
Photo electric effect - Matter Waves - Davisson and Germer experiment - Heisenberg’s Uncertainty principle - Schrodinger’s wave equation - particle in one dimensional box - Electron microscope - Scanning electron microscope - Transmission electron microscope.

L: 45 TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
COURSE OUTCOMES
Upon completion of this course, the students will be able to
CO 1: identify suitable water treatment techniques for industrial and domestic purpose. (K3)
CO 2: explain the type of corrosion and corrosion control methods. (K2)
CO 3: select the polymer for specific application. (K3)
CO 4: explain nano materials preparation. (K2)
CO 5: outline the principle and instrumentation of various analytical techniques. (K2)

UNIT I WATER TREATMENT

UNIT II CORROSION AND ITS CONTROL
Chemical corrosion – electrochemical corrosion – mechanism – different types of electrochemical corrosion – factors influencing corrosion – corrosion control methods.

UNIT III ENGINEERING POLYMERS

UNIT IV NANO MATERIALS
Nanoparticles – synthesis of CNT – precipitation, thermolysis, hydrothermal, solvothermal, electrodeposition, chemical vapour deposition, laser ablation – toxic effect of nano materials- properties and applications.

UNIT V ANALYTICAL TECHNIQUES
Principle, instrumentation and applications of UV-Visible and IR spectroscopy; chromatography: instrumentation and working of gas chromatography and HPLC; conductivity measurements – pH measurements – applications.

L: 45 TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
15SH15C INTRODUCTION TO ENGINEERING
(Common to all B.E./B.Tech. Degree Programmes) 2 0 0 2

COURSE OUTCOMES
Upon Completion of this course, the students will be able to

CO 1: recognizes the needs of engineering and should be able to acquaint with various fields of engineering and technology. (A4, K2)
CO 2: practices how to be successful in work and life in general. (K2, S3, A5)
CO 3: feels proud to be an engineering student. (A4)
CO 4: appreciates the initial career profiles of engineers. (A3)
CO 5: prepares for an Engineering Career. (A5)
CO 6: should be able to appreciate creative thinking means to provide engineering solution (K2, A3)
CO 7: should be able to appraise the values of Outcome Based Education and Choice Based Credit System. (K2, A2)

UNIT I HISTORY OF ENGINEERING AND INTRODUCTION TO ENGINEERING PROFESSION


Introduction to Engineering Profession: Engineering work is all around you - Engineering as a profession and common traits of Good Engineers – History of Engineering Disciplines – Functions of Engineering.

UNIT II CAREER PATHS OF ENGINEER AND PREPARING FOR AN ENGINEERING CAREER

Career Paths for Engineers: The corporate ladder, The independent entrepreneur, Employment Opportunities in Government, The military, Engineering and social service abroad, The Engineering Professor, Graduate work outside of engineering, A mix of two or more of the first six options.


UNIT III PROFILES OF ENGINEERS


UNIT IV OVERVIEW OF OBE AND CBCS

Graduate attributes of Washington Accord – Programme Specific Criteria (PSC) – Programme Educational Objectives (PEOs) – Programme Outcomes (POs) – Course Outcomes (COs) – CBCS : Course categories - Scheme of instruction, Assessment and Evaluation.

UNIT V LEARNING AND CREATIVE THOUGHT

Introduction: The successful engineering student - the engineering curriculum - curriculum planning and management - adapting to the college classroom.

The learning process: the nature of learning - information processing and memory - determinants of efficient learning - practical suggestions for learning.

Differences in the way people think: The four-quadrant model of thinking - hindrances to problem solving.
On Creativity: What is creativity? - the nature of creativity - characteristics of creative people - the creative process - overcoming obstacles to creative thinking.

L: 30 TOTAL: 30 PERIODS

REFERENCES

WEB RESOURCES
www.ieagreements.org/IEA-Grad-Attr-Prof-Competencies.pdf
COURSE OUTCOMES

Upon completion of this course, the students will be able to
CO 1: use the drawing instruments effectively. (K2, S4, A3)
CO 2: draw the projections of points, straight lines, planes. (K2, S3, A3)
CO 3: construct the projections of various solids in different positions. (K3, S3, A3)
CO 4: draw the sectional views of various solids and construct the true shape of the section. (K3, S3, A3)
CO 5: identify and draw the surface areas of simple solids. (K3, S3, A3)
CO 6: draw perspective views of simple solids and draw the orthographic views of simple objects. (K3, S3, A3)

UNIT I  PROJECTION OF POINTS, LINES AND PLANE SURFACES 12
Drawing Instruments - IS specifications on lines - drawing sheets - Printing letters and dimensioning - scales - First angle projection. (Not for examination).
Projections of points and straight lines located in the first quadrant - Determination of true lengths and true inclinations. Projections of regular polygonal surfaces and circular lamina inclined to both reference planes

UNIT II  PROJECTION OF SOLIDS 12
Projections of simple solids - axis inclined to one reference plane - change of position method.

UNIT III  SECTION OF SOLIDS 12
Sectioning of simple solids - cutting planes inclined to one reference plane and perpendicular to the other.

UNIT IV  DEVELOPMENT OF SURFACES AND ISOMETRIC PROJECTIONS 12
Development of lateral surfaces of simple and truncated solids - Principles of isometric projection and view of simple solids - truncated prism and pyramids.

UNIT V  PERSPECTIVE PROJECTIONS AND ORTHOGRAPHIC PROJECTIONS 12
Perspective projection of cube, prisms and pyramids by visual ray method and vanishing point method. Orthographic projection - simple objects with straight and curved surfaces.

L: 30 P: 30 TOTAL: 60 PERIODS

TEXT BOOKS

REFERENCES
PART A – ENGINEERING PHYSICS LABORATORY

COURSE OUTCOMES
Upon completion of this course, the students will be able to
CO1: demonstrate the properties of light waves. (K2, S3)
CO2: interpret the production of ultrasounds and how the velocity of ultrasounds varies with respect to medium. (K2, S3)
CO3: illustrate the mechanical and electrical properties of materials. (K2, S3)

LIST OF EXPERIMENTS
1. Determination of thickness of a thin wire – Air wedge method.
2. Determination of velocity of sound and compressibility of the liquid – Ultrasonic Interferometer.
3. Determination of Dispersive power of a prism using Spectrometer.
5. Torsional pendulum – Determination of Moment of Inertia of the disc and Rigidity modulus of the material of the wire.
6. Determination of specific resistance of a given coil of wire – Carey Foster’s Bridge.
10. Determination of temperature coefficient of resistance.

P:15 TOTAL: 15 PERIODS

PART B - ENGINEERING CHEMISTRY LABORATORY

COURSE OUTCOMES
Upon completion of this course, the students will be able to
CO 1: estimate the amount of hardness of the water sample (K5, S3)
CO 2: determine the rate of corrosion (K5, S3)
CO 3: synthesize a polymer and to determine molecular weight of the polymer (K6, S3)
CO 4: synthesize silver nano particles (K6, S6)
CO 5: quantify different ions by different analytical techniques (K5, S3)

LIST OF EXPERIMENTS
1. Estimation of hardness of water sample by EDTA method
2. Rate of corrosion- weight loss method
3. Synthesis of urea-formaldehyde resin
4. Determination of molecular weight of a polymer – Oswald’s viscometer
5. Synthesis and characterization of silver nano particles.
6. Estimation of iron (Fe^{2+}) in water sample by dichrometry
7. Estimation of hydrochloric acid by conductometric method
8. Estimation of mixture of acids by conductometric method

P: 15 TOTAL: 15 PERIODS

- A minimum of FIVE experiments shall be offered.
- Laboratory classes on alternate weeks for Physics and Chemistry.
REFERENCES

15SH18C ENGINEERING PRACTICE LABORATORY (Common to all B.E./B.Tech. Degree Programmes) L T P C 0 0 2 1

PART A - MECHANICAL LABORATORY

COURSE OUTCOMES
Upon completion of this course, the students will be able to
CO 1: prepare basic carpentry jobs (at least three joints). (K3,S2,A2)
CO 2: prepare the welded joint (minimum three) using arc and gas welding. (K3,S2,A2)
CO 3: Machine metals using lathe, shaper and drilling machine (each one job). (K3,S2,A2)

UNIT I CARPENTRY PRACTICES 5
Study of carpentry tools – preparation of joints like half lap, Tee and dove tail in wood.

UNIT II WELDING 5
Study of welding tools – Preparation of welded joints with Mild steel specimen like lap, butt and tee joints using ARC and Gas welding. (any one exercise should be given using Gas welding among three)

UNIT III BASIC MACHINING PRACTICES 5
Simple turning and taper turning using lathe – use of shaper and drilling machine for basic operations (Minimum three exercises should be given for students)

P: 15 TOTAL: 15 PERIODS

TEXT BOOK

REFERENCES
PART – B ELECTRICAL AND ELECTRONICS LABORATORY

COURSE OUTCOMES

Upon completion of this course, the students will be able to,

CO 1: develop simple residential wiring circuits. (K6)
CO 2: calculate the basic electrical quantities. (K4)
CO 3: identify the value of resistance using appropriate methods. (K4, A4)
CO 4: realize the fundamentals of Boolean algebra using digital logic gates. (A4)
CO 5: practice soldering to design PCB for electronic circuits. (A5)

I. ELECTRICAL ENGINEERING PRACTICE

1. Residential house wiring using switches, fuse, indicator, lamp and energy meter.
2. Fluorescent lamp wiring.
5. Measurement of energy using single phase energy meter.

II. ELECTRONICS ENGINEERING PRACTICE

1. Study of Electronic components and equipments – Resistor, colour coding, measurement of AC signal parameters (peak-peak, rms period, frequency) using CRO
2. Study of logic gates AND, OR, XOR and NOT.
4. Soldering practice – Components, Devices and Circuits – Using general purpose PCB.
5. Measurement of ripple factor of HWR and FWR.

P: 15 TOTAL: 15 PERIODS

REFERENCES

COURSE OUTCOMES

Upon completion of this course, the students will be able to

CO 1: contribute the lingual power to frame sentences in different context. (A2)
CO 2: write effectively in any Professional context. (A2)
CO 3: acquire the skills related to Group discussion. (A2)
CO 4: communicate and respond in different social and professional contexts. (A3)
CO 5: recall the acquired skills in solving competitive exam. (K3)

UNIT I 9
Phrasal Verbs (Based on root words: call, come, get, look, put, run, and take) - Foreign Words and Phrases (from the given list) - Listening to audio files and finding the technical words and framing different sentences - Channel conversion - Descriptive writing on various charts.

UNIT II 9
Idioms and Phrases (with animal names from the given list) - Report writing (types-structure-stages in report writing - model report) - Job Application Letter with curriculum vitae.

UNIT III 9
One word substitution (from the list given) Group Discussion (Why is GD a part of selection process? - Structure of GD – Strategies in GD – Team Work - Body Language - Video Samples-GD).

UNIT IV 9
Choosing a suitable connotation (from the given list) - Note making – Preparing Circular and Minutes of meeting – Listening to TED Talks – Giving opinion on the given TED Talks and interviewing the TED talkers.

UNIT V 9
Error Spotting (Tense, Relative Pronouns, Conjunctions, Sentence Structure, Adverb Placement) Sentence Completion - Reading comprehension.

L: 45 TOTAL: 45 PERIODS

Activity: Each student should read the suggested fiction for oral assignment.

TEXT BOOK

REFERENCES

Listening files: Audio files from net sources and softwares: ODLL, Globerena.
15EC22C  CALCULUS AND LAPLACE TRANSFORMS  L T P C
3  2  0  4

COURSE OUTCOMES
Upon completion of this course, the students will be able to
CO 1: evaluate area and volume using double and triple integrals. (K3)
CO 2: analyze the concepts related to vector calculus and apply them in engineering field. (K3)
CO 3: grasp analytic functions and their properties and be introduced to the host of conformal mappings. (K2)
CO 4: perform the ideas of Laplace transform. (K3)

UNIT I  MULTIPLE INTEGRALS  15
Double integration – Cartesian and polar coordinates - Change of order of integration - Change of variables between Cartesian and polar coordinates - Triple integration in Cartesian coordinates - Area as double integral.

UNIT II  VECTOR CALCULUS  15
Gradient, Divergence and Curl – Directional derivative – Irrotational and solenoidal vector fields - Vector integration – Green's theorem in a plane, Gauss divergence theorem and Stokes' theorem (excluding proofs) – Simple applications involving cubes and rectangular parallelepipeds.

UNIT III  ANALYTIC FUNCTIONS  15
Functions of a complex variable – Analytic functions – Necessary and Sufficient conditions (excluding proofs) – Harmonic and orthogonal properties of analytic functions – Harmonic conjugate – Construction of analytic functions – Conformal mapping: w=z+c, cz, 1/z and bilinear transformation.

UNIT IV  LAPLACE TRANSFORMS  16

UNIT V  APPLICATIONS OF LAPLACE TRANSFORMS  14
Solutions of linear ordinary differential equations of second order with constant coefficients - Solutions of simultaneous differential equations of first order with constant coefficients – Solutions of Integro-differential equations.

L: 45 T: 30 TOTAL: 75 PERIODS

TEXT BOOKS

REFERENCES
15EC23C SEMICONDUCTOR PHYSICS (Common to ECE & EEE) L T P C 3 0 0 3

COURSE OUTCOMES
Upon completion of this course, the students will be able to
CO 1: explain the basics of semiconductors. (K2)
CO 2: discuss the V - I characteristics of diode and apply the diode concept in rectifiers. (K2)
CO 3: compare the characteristics of various transistors. (K2)
CO 4: describe the operation and characteristics of different types of semiconductor devices (K1)
CO 5: express the properties and applications of the optical materials. (K2)

UNIT I SEMICONDUCTORS 9
Intrinsic semiconductor – carrier concentration – determination of bandgap energy - Extrinsic semiconductors – carrier concentration - Hall effect.

UNIT II PN JUNCTION DIODE AND ITS APPLICATIONS 9

UNIT III TRANSISTORS 9
BJT: Construction and Operation of NPN and PNP Transistors - Study of CE, CB and CC configurations and comparison of their characteristics – Breakdown in Transistors.
FET: Construction and Operation of N-Channel JFET – Expression for Drain Current, Comparison of JFET and BJT. MOSFET: Structure and Operation of N MOS and P MOS in Enhancement and Depletion nodes – characteristics of N type MOSFET – Comparison of MOSFET with JFET

UNIT IV SPECIAL SEMICONDUCTOR DEVICES 9
SCR – UJT – DIAC and TRIAC – Tunnel diode - PIN diode – Photodiode - Phototransistor – Varactor diode, LDR.

UNIT V OPTICAL MATERIALS 9
Optical properties of metals, insulators and semiconductors - Liquid Crystal Display – LED – Thermography - Solar cell.

L:45 TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
COURSE OUTCOMES
Upon completion of this course, students will be able to
CO 1: analyze the circuits using various network theorems and graph theory (K1-K4)
CO2: compute the transient response of RL, RC and RLC circuits for AC and DC inputs. (K1-K3)
CO 3: determine the resonance condition for series and parallel circuits. (K1-K3)

UNIT I CIRCUIT ANALYSIS TECHNIQUES FOR DC CIRCUIT 15

Network Theorems: Thevenin’s Theorem, Superposition Theorem, Norton’s Theorem, Maximum Power Transfer Theorem.

UNIT II CIRCUIT ANALYSIS TECHNIQUES FOR AC CIRCUIT 15

UNIT III RESONANT CIRCUITS 15

UNIT IV TRANSIENT RESPONSE FOR CIRCUIT 15
Transient Response of RL, RC and RLC Circuits using Laplace Transform for DC input and AC with sinusoidal input.

UNIT V CIRCUIT ANALYSIS USING GRAPH THEORY AND TWO PORT NETWORKS 15

L: 45 T:30 TOTAL: 75 PERIODS

TEXT BOOKS

REFERENCES
COURSE OUTCOMES

Upon completion of this course, the students will be able to

CO1: recognize the system fundamentals and the role of hardware components of the Computer. (K3)

CO2: apply the basic concepts and solve simple problems by analyzing the logics of conditional statements and looping constructs. (K3)

CO3: handle similar types of data using array and utilize their functionality. (K3)

CO4: appreciate the call by value and call by reference features in functions. (K5)

CO5: design programs involving their own derived data types, pointers, memory allocation concepts. (K4)

CO6: handle the file contents with access permissions. (K3)

UNIT I   COMPUTER FUNDAMENTALS 10


UNIT II   BASIC C PROGRAMMING 9

Overview of C Program – Constants, Variables and Data Types – Operators and Expressions – Managing Input and Output operations – Decision Making and Branching – Decision making and Looping.

UNIT III   ARRAYS AND FUNCTIONS 9


UNIT IV   STRUCTURES AND POINTERS 9


UNIT V   FILES AND DYNAMIC MEMORY ALLOCATION 8

File management in C – Defining and opening a file – closing a file - Input and Output operations on file – Error handling during IO operations – Random access to files – Command line Arguments. Dynamic memory allocation: Allocating a block of memory - Allocating a multiple block of memory – Releasing the used space – Altering the size of a block

L: 45 TOTAL: 45 PERIODS

TEXT BOOKS


REFERENCES

COURSE OUTCOMES
Upon completion of this course, the students will be able to

CO 1: explain the structure and function of ecosystem (K2)
CO 2: recognize the values of biodiversity and natural resources and the ways to protect the biodiversity of his /her locality (K1)
CO 3: explain the causes and effects of pollution (K2)
CO 4: describe social issues related to the environment and the environment act (K2)
CO 5: identify the nutrients in food and impact of metals on human health (K1)

UNIT I ENVIRONMENT AND ECOSYSTEMS 9
Scope and importance of environment – need for public awareness –ecosystem – structure and function of an ecosystem – energy flow in the ecosystem – forest and aquatic ecosystems – Field study of simple ecosystems – pond and forest.

UNIT II BIODIVERSITY AND NATURAL RESOURCES 9
Biodiversity: genetic, species and ecosystem diversity – threats to biodiversity – endangered and endemic species in India – conservation of biodiversity; forest resources: use and over-exploitation – deforestation - dams and their effects on forests and tribal people – water resources: use and overutilization of surface and ground water – role of an individual in conservation of natural resources.

UNIT III ENVIRONMENTAL POLLUTION 9

UNIT IV SOCIAL ISSUES, HUMAN POPULATION AND ENVIRONMENTAL LAW 9

UNIT V FOOD AND HUMAN HEALTH 9

L: 45 TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
2. Strange C. “Environmental Science and production” Nason Trest Publisher, 2010
PART A – SEMICONDUCTOR PHYSICS LABORATORY

COURSE OUTCOMES

Upon completion of this course, the students will be able to

CO 1: demonstrate the properties of optical materials. (K2, S3)
CO 2: analyze the characteristics of semiconducting materials and devices. (K3, S3)
CO 3: design the rectifier using PN diode (K3, S3)

LIST OF EXPERIMENTS

1. (a) Determination of wave length of Laser source.
   (b) Particle size determination using Diode Laser.
   (c) Determination of Numerical aperture and acceptance angle of an optical fiber.
2. Determination of Band Gap of a semiconductor material.
4. Transistor Characteristics of BJT (CB & CE) and FET.
5. V-I Characteristics of UJT/Photo diode/ Photo Transistor.
6. V-I Characteristics of SCR.
7. Characteristics of LED/LCD/LDR.

P:15 TOTAL: 15 PERIODS

PART - B ENVIRONMENTAL CHEMISTRY LABORATORY

COURSE OUTCOMES

Upon completion of this course, the students will be able to

CO 1: quantify the amount of acidity, alkalinity, DO and COD present in water sample (K5, S3)
CO 2: analyse the ions present in the soil (K4, S3)
CO 3: quantify the amount of chloride ion in water sample (K5, S3)
CO 4: identify the adulteration in food samples (K1, S3)
CO 5: estimate the amount of metal ions in water sample (K5, S3)

LIST OF EXPERIMENTS

1. Estimation of acidity of Water sample.
2. Estimation of alkalinity of Water sample.
3. Determination of Dissolved Oxygen (DO) in water sample (Winkler’s method).
4. Determination of COD in water sample.
7. Estimation of chloride ion in water sample by argentometric method.
8. Simple adulteration test in food samples.

P:15 TOTAL: 15 PERIODS

• A minimum of FIVE experiments shall be offered.
• Laboratory classes on alternate weeks for Physics and Chemistry.
REFERENCES
COURSE OUTCOMES

Upon completion of this course, the students will be able to

CO 1: solve the given problem using the syntactical structures of C language. (K3)
CO 2: develop, execute and document computerized solution for various logic based problems using the flow control features of C language. (K3)
CO 3: enhance the programming skills in C by discriminating constants, variables and arrays and the functionality. (K3)
CO 4: learn about the connection between function return values and variables. (K5)
CO 5: develop programs using string manipulation and file manipulation functions. (K3)

Simple programs

1. Solve problems such as temperature conversion, student grading, interest calculation.
2. Solving the roots of a quadratic equation
3. Designing a simple arithmetic calculator. (Use switch statement)
4. Given distance traveled by a vehicle as \( d = ut + \frac{1}{2}at^2 \), where ‘u’ and ‘a’ are the initial velocity and acceleration. Calculate the distance traveled for different time intervals

Programs using different control structures

5. Performing the following operations:
   a. Generate Pascal’s triangle.
   b. Construct a Pyramid of numbers.
6. Generation of the first ‘n’ terms of the Fibonacci sequence and prime sequence.
8. Finding the 2’s complement of a binary number.

Programs using arrays

9. Performing the following operations:
   a. Matrix addition.
   b. Transpose of a matrix.
   c. Matrix multiplication by checking compatibility.

Programs using string manipulation

10. Performing the following operations to a string:
    a. To insert a sub-string into main string at a given position.
    b. To delete ‘n’ characters from a given position in a string.
    c. To replace a character of string either from beginning or ending or at a specified location.

Programs using functions

11. Performing the following operations: (Use recursive functions)
    a. To find the factorial of a given integer.
    b. To find the GCD (Greatest Common Divisor) of two given integers.
    c. To solve Towers of Hanoi problem.

Programs using files


P:30 TOTAL: 30 PERIODS
15EC29C    CIRCUITS AND DEVICES LABORATORY     L T P C
                                                     0 0 2 1

COURSE OUTCOMES
Upon completion of this course, the students will be able to
CO 1: analyze the circuits using various network theorems and laws. (K2-K4, S1)
CO 2: determine the parameters from the characteristics of semiconductor devices.
        (K1-K3, S2, S3)
CO3: analyze the given circuit under transient and steady state conditions.
        (K2-K4, S2)
CO4: demonstrate the applications of Semiconductor devices. (K2, K3, S2, S3)

LIST OF EXPERIMENTS
1. Verification of KVL & KCL
2. Verification of Thevenin’s Theorem.
3. Verification of Norton’s Theorem.
4. Verification of Superposition Theorem.
5. Verification of Maximum Power Transfer Theorem.
8. Characteristics of MOSFET.

P: 30 TOTAL: 30 PERIODS