REGULATIONS - 2015

DEPARTMENT OF
ELECTRICAL AND ELECTRONICS ENGINEERING

CURRICULUM & SYLLABUS - FIRST YEAR

B.E. – ELECTRICAL AND ELECTRONICS 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

- Promoting active learning, critical thinking coupled with ethical values to meet the global challenges.

MISSION

- To instill state-of-the-art technical knowledge and research capability that will prepare our graduates for professionalism and life-long learning.

- To update knowledge to meet industrial and real world challenges.

- To inculcate social and ethical values.

Program Educational Objectives (PEO)

- Excel in industrial or graduate work in Electrical Engineering and allied fields.

- Practice their profession conforming to ethical values and active participation in the affairs of the profession.

- Adapt to evolving technologies and stay current with their profession.
Program Outcomes (PO)

POs describe the expectation of students to know by the time of graduation from the programme. Programme Outcomes are recognized as per the process described in 2.1.3. The Programme Outcomes of UG in Electrical and Electronics Engineering are:

1. An ability to apply the knowledge of mathematics, physical sciences, and engineering fundamentals to the solution of complex problems in electrical and electronics engineering.

2. An ability to identify, formulate and analyze the complex electrical and electronics engineering problems by applying first principles of engineering knowledge.

3. An ability to design a system, component, or process and development of solutions to meet desired needs with economic, environmental, social, health and safety constraints.

4. An ability to investigate complex electrical and electronics engineering problems by conducting suitable experiment, analysis and interpretation of data and synthesize the solutions.

5. An ability to use the techniques, skills, and modern engineering tools necessary for electrical and electronics engineering practice.

6. An ability to develop an understanding of contemporary technical and professional issues in the practice of complex electrical and electronics engineering problems in societal context.

7. An ability to understand and evaluate the sustainability of the solutions of complex electrical and electronics engineering problems in global and environmental contexts.

8. An ability to practice the profession with ethical responsibilities.

9. An ability to apply the coordinated effort as an individual or as a part of the team.

10. An ability to communicate effectively in oral and written forms.

11. An ability to apply the project and finance management skills.

12. An ability to recognize the need for and to engage in life-long learning in the broadest context of technological changes.
# B.E. – ELECTRICAL AND ELECTRONICS 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></td>
<td>THEORY AND INTEGRATED COURSES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<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>
<tr>
<td></td>
<td>PRACTICAL COURSES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<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>
<td></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>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>16</td>
<td>2</td>
<td>6</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

## 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></td>
<td>THEORY COURSES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>MAC</td>
<td>15EE21C</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>15EE22C</td>
<td>Calculus, Probability and Statistics®</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>15EE23C</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>15EE24C</td>
<td>Circuit Theory</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>15EE25C</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>15EE26C</td>
<td>Environmental Science and Engineering*</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>PRACTICAL COURSES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>SFC</td>
<td>15EE27C</td>
<td>Semiconductor Physics and Environmental Chemistry Laboratory®</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>CFC</td>
<td>15EE28C</td>
<td>C Programming Laboratory®</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>SFC</td>
<td>15EE29C</td>
<td>Electric Circuits Laboratory</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>18</td>
<td>4</td>
<td>6</td>
<td>23</td>
<td></td>
</tr>
</tbody>
</table>

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 EEE and EIE, #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>-</td>
<td>-</td>
<td>100</td>
</tr>
<tr>
<td>B</td>
<td>-</td>
<td>10</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1 Qn Compulsory &amp; 4 Qns (either or type)</td>
<td>100</td>
</tr>
<tr>
<td>C</td>
<td>10</td>
<td>-</td>
<td>10 out of 12</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1 Qn Compulsory &amp; 4 Qns (either or type)</td>
<td>100</td>
</tr>
<tr>
<td>D</td>
<td>10</td>
<td>10</td>
<td>5 out of 6</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1 Qn Compulsory &amp; 4 Qns (either or type)</td>
<td>100</td>
</tr>
<tr>
<td>E</td>
<td>-</td>
<td>10</td>
<td>5 out of 6</td>
<td>-</td>
<td>-</td>
<td>1 Qn Compulsory &amp; 4 Qns (either or type)</td>
<td>-</td>
<td>100</td>
</tr>
</tbody>
</table>

FORMAT FOR COURSE CODE

```
1 5 E E 2 3 C
```

- **1**: Compulsory Course
- **5**: Course Sequence Number
- **E**: Semester Number
- **E**: Branch Name
- **2**: Year of Regulation

Page 6 of 27
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, Globerenas.
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 15
Characteristic equation – Eigen values and Eigen vectors of a real matrix – Independence 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 15
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 15
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 15
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 15

TEXT BOOKS

REFERENCES
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

L: 45 TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
15SH14C ENGINEERING CHEMISTRY (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: 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 9
domestic water treatment – desalination.

UNIT II CORROSION AND ITS CONTROL 9
Chemical corrosion – electrochemical corrosion – mechanism – different types of electrochemical corrosion – factors influencing corrosion – corrosion control methods.

UNIT III ENGINEERING POLYMERS 9

UNIT IV NANO MATERIALS 9
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 9
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
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 L T P C (Common to all B.E./B.Tech. Degree Programmes) 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
Study of carpentry tools – preparation of joints like half lap, Tee and dove tail in wood.

UNIT II WELDING
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
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
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
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
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
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
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.
15EE22C  CALCULUS, PROBABILITY AND STATISTICS  L T P C
(Common to EEE and EIE)  3 2 0 4

COURSE OUTCOMES
Upon completion of this course, the students will be able to
CO 1: compute and change variables in double and triple integrals. (K3)
CO 2: analyze the concepts related to vector calculus and apply them in engineering
field. (K3)
CO 3: use the concepts of multivariate random variables. (K2)
CO 4: calculate the various measures of dispersion. (K3)
CO 5: explain and successfully apply all aspects of appropriate testing techniques. (K3)

UNIT I  MULTIPLE INTEGRALS  15
Double integration – Cartesian and polar coordinates - Change of order of integration - Change of
variables - Cartesian to polar coordinates- Area as double integral- Triple integration - Cartesian
and polar coordinates – Change of Variables- Cartesian to spherical and cylindrical coordinates.

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

UNIT III  PROBABILITY  15
Discrete and continuous random variables – Moments - Moment generating function and their
properties- Normal Distribution - Joint distributions - Marginal and conditional distributions -
Covariance - Correlation and Regression.

UNIT IV  STATISTICS  15
Mean, median, mode and standard deviation – Moments – Skewness – Kurtosis - Correlation of
single and bivariate frequency distributions – Regression lines.

UNIT V  TESTING OF HYPOTHESIS  15
Sampling distributions - Tests for single mean, Proportion, Difference of means (for large samples)
– Tests for single variance and equality of variances – t-test, F-Test and Chi-square test for
goodness of fit – Independence of attributes.

L: 45 T:30  TOTAL: 75 PERIODS

TEXT BOOKS
   2012.
2. Ronald E.Walpole, Raymond H.Myres, Sharon L.Myres, Keying E. Ye, "Probability and

REFERENCES
2. Richard Arnold Johnson, Irwin Miller, John E Freund, “Miller and Freund’s Probability and
15EE23C 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
Intrinsic semiconductor – carrier concentration – determination of bandgap energy - Extrinsic semiconductors – carrier concentration - Hall effect.

UNIT II PN JUNCTION DIODE AND ITS APPLICATIONS

UNIT III TRANSISTORS
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
SCR – UJT – DIAC and TRIAC –Tunnel diode - PIN diode – Photodiode - Phototransistor – Varactor diode, LDR.

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

L:45 TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
15EE24C CIRCUIT THEORY L T P C
3 2 0 4

COURSE OUTCOMES
Upon the successful completion of this course, the students will be able to,
CO 1: describe the basic concepts of electric circuits.
CO 2: illustrate the network theorems for DC and AC circuits.
CO 3: explain the concepts of resonant circuits.
CO 4: analyze the dynamic behavior of electric circuits
CO 5: analyze the three phase electric circuits.

UNIT I  BASIC CIRCUITS ANALYSIS 15

UNIT II  NETWORK REDUCTION AND NETWORK THEOREMS FOR DC AND AC CIRCUITS 15
Network reduction: voltage and current division, source transformation – Star-delta conversion - Thevenin’s and Norton’s Theorem – Superposition Theorem – Maximum Power Transfer Theorem – Reciprocity Theorem.

UNIT III  RESONANCE AND COUPLED CIRCUITS 15
Series and parallel resonance – Quality factor and Bandwidth – Self and mutual inductance – Coefficient of coupling – Single tuned circuits.

UNIT IV  TRANSIENT RESPONSE ANALYSIS 15
Transient response of RL, RC and RLC Circuits using Laplace transform for DC input and AC with sinusoidal input.

UNIT V  ANALYSIS OF THREE PHASE CIRCUITS 15
Three phase balanced / unbalanced voltage sources – Analysis of three phase 3-wire and 4- wire circuits with star and delta connected loads, balanced and unbalanced loads – Phasor diagram of voltages and currents – power and power factor measurements in three phase circuits.

L: 45 T: 30 TOTAL: 75 PERIODS

TEXT BOOKS

REFERENCES
15EE25C  C PROGRAMMING FOR ENGINEERS  L T P C
(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: recognize the system fundamentals and the role of hardware components of the Computer. (K3)
CO 2: apply the basic concepts and solve simple problems by analyzing the logics of conditional statements and looping constructs. (K3)
CO 3: handle similar types of data using array and utilize their functionality. (K3)
CO 4: appreciate the call by value and call by reference features in functions. (K5)
CO 5: 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
Causes, effects and control measures of air pollution, water pollution, soil pollution, noise pollution
and nuclear hazards – solid waste management – e-waste – toxic substances in e-waste – risks
related to toxic substances – role of an individual in prevention of pollution.

UNIT IV SOCIAL ISSUES, HUMAN POPULATION AND ENVIRONMENTAL LAW 9
Water conservation – rain water harvesting – climate change – global warming, acid rain, ozone
layer depletion – population growth – population explosion – family welfare programme;
environment laws: the water (prevention and control pollution) act, 1974-the air (prevention and
control of pollution) act, 1981-environmental (protection) act,1986-the wild life (protection) act
1972.

UNIT V FOOD AND HUMAN HEALTH 9
Carbohydrates, amino acids, proteins, lipids and vitamins in balanced diet food; disease caused by
deficiency of carbohydrates, amino acids, proteins, lipids and vitamins - food adulteration - simple
test for food adulterants; environmental toxicology: metals in environment- impacts of fluoride,
arsenic, cadmium, mercury and chromium on human health.

L: 45 TOTAL: 45 PERIODS

TEXT BOOKS
Co., 2012.

REFERENCES
2. Strange C. “Environmental Science and production” Nason Trest Publisher, 2010
15EE27C SEMICONDUCTOR PHYSICS AND ENVIRONMENTAL CHEMISTRY LABORATORY
(Common to ECE and EEE)

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
15EE29C ELECTRIC CIRCUITS LABORATORY L T P C 0 0 2 1

COURSE OUTCOMES
Upon the successful completion of this course, the students will be able to,
CO 1: illustrate the basic concepts of electric circuits.
CO 2: relate the physical observations in network theorems of electrical circuits to theoretical principles.
CO 3: examine the electric circuits using mesh and nodal analysis.
CO 4: analyze the dynamic behavior of electric circuits using PSIM.
CO 5: compute the frequency response of resonant and tuned circuits.

LIST OF EXPERIMENTS
1. Verification of Ohm's laws and Kirchoff's laws
2. Verification of Thevenin's and Norton's theorem
3. Verification of Superposition theorem
4. Verification of Maximum Power Transfer theorem
5. Verification of Reciprocity theorem
6. Measurement of self inductance of a coil
7. Verification of mesh and nodal analysis
8. Transient response of RL and RC circuits for DC input
9. Frequency response of series and parallel resonance circuits
10. Frequency response of single tuned coupled circuits

P: 30 TOTAL: 30 PERIODS