REGULATIONS – 2013

CURRICULUM AND SYLLABI OF

B.E. / B.Tech., – FIRST SEMESTER
VISION

Transforming lives through compassionate quality education and research with human values

MISSION

- To produce competitive and versatile engineering graduates for facing the challenges of globalization
- To provide a conducive 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 efforts
### CURRICULUM AND SYLLABI

#### SEMESTER I (Common to all B.E. / B.Tech., Degree Programmes)

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<tr>
<th>Sl. No.</th>
<th>Course Code</th>
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<td>SH100</td>
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<td>Part B – Electrical and Electronics Engineering Practices</td>
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**Total Number of Credits:** 27
SH100  
TECHNICAL ENGLISH – I  
(Common to all B.E. / B.Tech., Degree Programmes)  

COURSE OUTCOMES  
The Student will  
- apply basic grammar in Writing and Speaking.  
- prepare formal Letter Writings.  
- come out with proper pronunciation.  
- speak confidently in interactions.  
- develop interest to read any article.  

UNIT I  
Language Focus: Technical Vocabulary, Word Formation, Concord, Tense (Present).  
Writing: Leave Application Letter, Paragraph writing.  
Listening: Listening to correct pronunciation of words.  

UNIT II  
Language Focus: Words often misspelled, Articles, Tense (Past)  
Writing: Permission letters (In-plant training/Seminar/Workshop), Chart description.  
Listening: Listening to the Sentences with correct stress and Intonation.  
Speaking: Situational Conversations.  

UNIT III  
Language Focus: Compound nouns, Tense (Future), Preposition, Comparative Adjectives.  
Listening: Listening to the conversations.  
Speaking: One minute speech.  

UNIT IV  
Language Focus: Modal verbs, Gerund, Infinitives, Voice.  
Writing: Writing Instructions, Letters to Editor.  
Listening: Listening to the different Tonal Expressions.  
Speaking: Giving Opinions.  

UNIT V  
Language Focus: ‘If’ Conditionals, ‘Wh’ questions, Question Tags.  
Writing: Reading and Note - taking  
Speaking: Group Discussion.  
Reading: ERC, one word questions from the suggested book.  

SUGGESTED ACTIVITIES  
2. Exercises on gap filling and correction of errors on Concord (Subject – Verb Agreement).  
3. Gap filling exercises using the appropriate Tense forms.  
4. Exercises on transferring information from Graph to Text – Bar charts, Flow charts.  
5. Making sentences using Modal verbs to express probability, compulsion, etc.  
6. Exercises on Writing Instructions.  
7. Exercises on framing Questions.  
8. Other relevant classroom activities.  

L: 45 T: 15 TOTAL: 60 PERIODS
BOOK SUGGESTED FOR READING

REFERENCES
SH101 MATRICES AND DIFFERENTIAL CALCULUS
(Common to all B.E. / B.Tech., Degree Programmes)

L T P C
3 1 0 4

COURSE OUTCOMES
- Ability to find inverse and integral powers of matrices and to perform transformations of matrices.
- Ability to find the evolutes of various curves.
- Ability to solve ordinary and partial differential equations.
- Ability to obtain constrained maxima and minima.

UNIT I MATRICES 12
Characteristic equation – Eigen values and Eigen vectors of a real matrix – Properties (excluding proofs); Cayley – Hamilton theorem (excluding proof) – Inverse and integral powers of a matrix using Cayley – Hamilton theorem; Diagonalisation of a matrix by orthogonal transformation; Quadratic form – Reduction of quadratic form to canonical form by orthogonal transformation.

UNIT II DIFFERENTIAL CALCULUS 12
Curvature in cartesian, parametric and polar forms; Centre, radius and circle of curvature; Evolutes.

UNIT III FUNCTIONS OF SEVERAL VARIABLES 12
Partial derivatives; Total derivatives; Differentiation of implicit functions; Jacobians; Maxima and Minima - Method of Lagrangian multipliers.

UNIT IV ORDINARY DIFFERENTIAL EQUATIONS 12
Higher order linear differential equations with constant coefficients; Method of variation of parameters; Cauchy’s and Legendre’s linear equations; Simultaneous first order linear equations with constant coefficients.

UNIT V PARTIAL DIFFERENTIAL EQUATIONS 12
Formation of partial differential equations; Lagrange’s linear equations; Solutions of standard types of first order partial differential equations; Linear partial differential equations of second and higher order with constant coefficients.

L: 45 T: 15 TOTAL: 60 PERIODS

TEXT BOOKS

REFERENCES
SH102  APPLIED PHYSICS
(Common to all B.E. / B.Tech., Degree Programmes)  L T P C
3 0 0 3

COURSE OUTCOMES
The students will be able to

- gain knowledge on the properties of matter and hydrodynamics.
- study and apply the ultrasonic methods for industrial and medical field.
- understand Lasers and to identify the appropriate Laser technique for industrial and medical field.
- understand the different types, fabrication, losses of optical fibers and the applications of fiber optics in communication and instrumentation.
- understand the physical properties of photons and electrons and to study the different Electron Microscopes.

UNIT I     PROPERTIES OF MATTER AND HYDRODYNAMICS  9

**Properties of Matter**
Stress, Strain, Hooke’s law; Types of moduli of elasticity; Torsional pendulum – Determination of Rigidity modulus of a wire; Bending of beams – Expression for bending moment – Measurement of Young’s modulus by uniform and Non-uniform bending – I Shaped girders.

**Hydrodynamics**
Stream line flow, Turbulent flow, Poiseuille’s formula for flow of liquid through a capillary tube, Determination of coefficient of viscosity of a liquid.

UNIT II    ULTRASONICS  9


UNIT III   LASERS  9

Principle of spontaneous emission and stimulated emission, Population inversion, Pumping, Einstein’s A and B coefficients – derivation; Types of Lasers - CO₂ Laser, Nd-YAG Laser, Semiconductor Laser (Homojunction); Determination of wavelength of Laser using grating and Particle size; Applications of Lasers: Industrial applications – Welding, Cutting and Heat treatment; Medical applications; Holography (construction and reconstruction).

UNIT IV    FIBER OPTICS AND ITS APPLICATIONS  9

Principle and propagation of light in optical fibers; Numerical aperture and Acceptance angle; Types of optical fibers – material, refractive index and mode; Double crucible technique of fiber drawing; Splicing – fusion splicing; Loss in optical fiber – attenuation, dispersion and bending; Fiber optical communication system (Block diagram); Advantages and Applications of optical fiber; Fiber optic sensors – temperature and displacement; Endoscope.

UNIT V     QUANTUM PHYSICS AND MICROSCOPY  9

Black body radiation – Planck’s theory (derivation) – Deduction of Wien’s displacement law and Rayleigh Jean’s Law from Planck’s theory; Photoelectric effect – Law of Photoelectric effect – Photoelectric equation; Matter Waves – De Broglie wavelength - Schrodinger’s wave equation – time independent and time dependent equations – Particle in one dimensional box; Heisenberg’s Uncertainty principle; Linear Harmonic oscillator; Electron microscope – scanning electron microscope – transmission electron microscope.

TOTAL: 45 PERIODS
TEXT BOOKS

REFERENCES
SH103 ENGINEERING CHEMISTRY
(Common to all B.E. / B.Tech., Degree Programmes)

L T P C
3 0 0 3

COURSE OUTCOMES
The students will be able to
- select suitable water treatment techniques for industrial and domestic purpose.
- acquire knowledge of electrochemistry.
- apply the contextual knowledge of adsorption techniques for industrial applications.
- synthesize polymers for domestic and industrial applications.
- understand the knowledge of nano materials for their applications in Science and Engineering.

UNIT I WATER TREATMENT 9

UNIT II ELECTRO ANALYTICAL TECHNIQUES 9
Electrode potential: definition, measurement of electrode potential, Nernst equation – problems; EMF: definition, measurement of EMF – Poggendorff’s method; reference electrode: standard hydrogen electrode, calomel electrode, glass electrode – measurement of pH using glass electrode; CO₂ sensing electrode; conductometric titrations: acid-base titration (HCl vs NaOH); potentiometric titrations: redox titration (Fe²⁺ vs K₂Cr₂O₇), precipitation titration (Ag⁺ vs NaCl).

UNIT III CATALYSIS AND SURFACE PHENOMENA 9
Types of catalysis – homogeneous catalysis – heterogeneous catalysis, mechanism of catalytic action - contact theory, catalytic promoters, catalytic poison; enzyme catalysis: Michaelis-Menton equation; adsorption: definition, types – physical adsorption – chemical adsorption – differences between physical and chemical adsorption; adsorption isotherms: definition, Freundlich and Langmuir adsorption isotherms, applications of adsorption.

UNIT IV ENGINEERING POLYMERS 9

UNIT V NANO MATERIALS 9
Nanoparticles: definition, carbon nanotubes (CNT), types of carbon nano tubes – single walled and multi walled carbon nanotubes – fullerene; synthesis of carbon nanotubes: chemical vapour deposition – laser ablation – arc-discharge method; properties of CNT: mechanical, electrical, thermal and optical properties; applications of carbon nanotubes in chemical field, medicinal field, mechanical field and current applications.

TOTAL: 45 PERIODS

TEXT BOOKS
REFERENCES

SH104  FUNDAMENTALS OF COMPUTING AND PROGRAMMING IN C  
( Common to all B.E. / B.Tech., Degree Programmes)  
L T P C  
3 0 0 3  

COURSE OUTCOMES  
- Learn the major components of a computer system.  
- Formulate the algorithms and analyze their complexity.  
- Identify the correct and efficient ways of solving problems.  
- Acquire knowledge about dynamic memory allocation, modular programming and data organization.  
- Develop real time applications using the power of C language features.  

UNIT I  COMPUTER FUNDAMENTALS  

UNIT II  BASIC C PROGRAMMING  
Structure of C Program – Keywords, Constants, Variables and Data Types – Operators and Expressions – Managing Input and Output operators – Decision Making – Branching and Looping.  

UNIT III  FUNCTIONS, ARRAYS AND POINTERS  

UNIT IV  STRUCTURES AND UNIONS  

UNIT V  FILE HANDLING  

TOTAL: 45 PERIODS  

TEXT BOOKS  

REFERENCES  
SH105  
ENGINEERING GRAPHICS  
(Common to all B.E. / B.Tech., Degree Programmes)  

L T P C  
2 3 0 4

COURSE OUTCOMES

- Students will be able to use the drawing instruments effectively.
- An ability to draw the basic engineering curves and problems related to projections of points, straight lines, planes and solids.
- Able to apply the knowledge acquired on practical applications of sectioning and development of solids.
- Able to draw simple solids and its sections in isometric view and projections and also to draw its perspective views.

Drawing Instruments – IS specifications on lines – drawing sheets – Printing letters and dimensioning – scales (not for examination) – First angle projection should be followed.

UNIT I  PLANE CURVES  
12
Conics – Construction of ellipse, Parabola and hyperbola by eccentricity method – Construction of cycloids – Epi and Hypo cycloids - construction of involutes of square and circle – Drawing of tangents and normals to the above curves.

UNIT II  PROJECTION OF POINTS, LINES AND PLANE SURFACES  
12
Projection of points and straight lines located in the first quadrant – Traces – Determination of true lengths and true inclinations.

Projection of regular polygonal surfaces and circular lamina inclined to any one reference plane.

UNIT III  PROJECTION OF SOLIDS  
12
Projection of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to one reference plane by change of position method.

UNIT IV  SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES  
12
Sectioning of above solids in simple vertical position by cutting planes inclined to one reference plane and perpendicular to the other – obtaining true shape of section.
Development of lateral surfaces of simple and truncated solids – Prisms, pyramids, cylinder and cone – Development of lateral surfaces of solids with cylindrical cutouts, perpendicular to the axis.

UNIT V  ISOMETRIC AND PERSPECTIVE PROJECTIONS  
12
Perspective projection of prisms, pyramids and cylinders by visual ray method and vanishing point method.

TOTAL: 60 PERIODS

Note: In end semester examination from each unit one question with either or pattern may be asked. No short questions.

TEXT BOOK

REFERENCES
SH106 C PROGRAMMING LABORATORY
(Common to all B.E. / B.Tech., Degree Programmes)  L T P C
0 0 3 2

COURSE OUTCOMES
- Acquire logical thinking and problem solving skills.
- Implement the algorithms and analyze their complexity.
- Identify the correct and efficient ways of solving problems.
- Acquire hands on practice in dynamic memory allocation, modular programming and data organization.
- Implement real time applications using the power of C language features.

LIST OF EXPERIMENTS
1. Solve problems such as temperature conversion, student grading, interest calculation.
2. Finding the 2’s complement of a binary number.
3. Generation of the first ‘n’ terms of the Fibonacci sequence and prime sequence.
5. 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.
6. Solving the roots of a quadratic equation.
7. Designing a simple arithmetic calculator. (Use switch statement)
8. Performing the following operations: (Use loop statement)
   i. Generate Pascal’s triangle.
   ii. Construct a Pyramid of numbers.
9. Performing the following operations to a string:
   i. To insert a sub-string into main string at a given position.
   ii. To delete ‘n’ characters from a given position in a string.
   iii. To replace a character of string either from beginning or ending or at a specified location.
10. Performing the following operations: (Use arrays)
    i. Matrix addition.
    ii. Transpose of a matrix.
    iii. Matrix multiplication by checking compatibility.
11. Performing the following operations: (Use recursive functions)
    i. To find the factorial of a given integer.
    ii. To find the GCD (Greatest Common Divisor) of two given integers.
    iii. To solve Towers of Hanoi problem.
12. Performing the Student Information Processing using File Handling concepts.

TOTAL: 45 PERIODS

SOFTWARE REQUIREMENTS
- Turbo C/ ANSI C Compiler
- Gcc compiler
SH107 PHYSICS AND CHEMISTRY LABORATORY – I
(Common to all B.E. / B.Tech., Degree Programmes)  

**PART A – PHYSICS LABORATORY – I**

**COURSE OUTCOMES**

At the end of the Laboratory classes, the students are able to
- develop collaborative learning skills and to add some of their own ideas to the experiments and their explanations.
- understand the optical properties, mechanical properties and electrical properties.

**LIST OF EXPERIMENTS**

1. (a) Particle size determination using Diode Laser.
   (b) Determination of Laser parameters – Wavelength, and angle of divergence.
   (c) Determination of Numerical aperture and acceptance angle of an optical fiber.
2. Determination of thickness of a thin wire – Air wedge method.
3. Determination of velocity of sound and compressibility of the liquid – Ultrasonic Interferometer.
5. Determination of Young’s modulus – Non-uniform bending method.
7. Determination of specific resistance of a given coil of wire – Carey Foster’s Bridge.

• **A minimum of FIVE experiments shall be offered.**

**PART B - CHEMISTRY LABORATORY – I**

**COURSE OUTCOMES**

The student
- can estimate the amount of hardness and acidity present in the water sample.
- gain knowledge about the estimation of nickel in an alloy.
- quantify the electrolyte by measuring the conductance and pH.

**LIST OF EXPERIMENTS**

1. Estimation of hardness of Water sample by EDTA method.
2. Estimation of acidity of Water sample.
3. Estimation of Nickel by EDTA method.
4. Conductometric titration (HCl Vs NaOH).
5. Conductometric titration (BaCl₂ Vs Na₂SO₄).
6. pH metric titration (HCl Vs NaOH).
7. Determination of molecular weight and degree of polymerization using Viscometry.

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

**TOTAL: 45 PERIODS**
SH108 ENGINEERING PRACTICES LABORATORY  
(Common to all B.E. / B.Tech., Degree Programmes)  

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COURSE OUTCOMES

- Students will be able to prepare the pipe connections and identify the various components used in plumbing.
- An ability to prepare simple wooden joints using wood working tools.
- An ability to prepare simple lap, butt and tee joints using arc welding equipments.
- An ability to prepare simple components using lathe and drilling machine.

PART A – MECHANICAL AND CIVIL ENGINEERING PRACTICES

I PLUMBING WORKS:  
Study of components related to plumbing.  
Hands-on-exercise:  
Basic pipe connections – Mixed pipe material connection – Pipe connections with different joining components.

II CARPENTRY PRACTICES:  
Study of the joints in roofs, doors, windows and furniture.  
Hands-on-exercise:  
Wood work, joints by sawing, planning and cutting.

III WELDING:  
Study of the tools used in welding Gas welding practice.  
Preparation of butt joints, lap joints and tee joints using arc welding.

IV BASIC MACHINING:  
(a) Simple Turning and Taper turning.  
(b) Drilling Practice.

REFERENCES


PART B – ELECTRICAL AND ELECTRONICS ENGINEERING PRACTICES

COURSE OUTCOMES

- An ability to develop familiarity with rudimentary measurement equipment – signal generators, oscilloscopes, multimeters and power supplies.
- Ability to demonstrate and evaluate the parameters of basic electronic components (wires, resistors, capacitors, diodes etc.) based on their physical parameters and dimensions.
- Define, describe, and analyze fundamentals of Boolean algebra and digital logic gates.
- An ability to predict qualitatively and quantitatively compute the steady state AC responses of basic circuits using the phasor method.
- Gain experience in the documentation of measurements and procedures as well as the preparation of formal reports.
I ELECTRICAL ENGINEERING PRACTICE 10

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 12

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.

TOTAL: 45 PERIODS

REFERENCES