



SONA COLLEGE OF TECHNOLOGY

(AN AUTONOMOUS INSTITUTION)

Junction Main Road, Salem – 636 005.



REGULATIONS 2015

Syllabus for the First Semester B.E./B.Tech. Programmes

(with effect from the academic year 2015 - 2016)

AUGUST 2015

SONA COLLEGE OF TECHNOLOGY, SALEM – 636 005

(An Autonomous Institution)

CHOICE BASED CREDIT SYSTEM (CBCS) - UG

Courses of Study for BE/BTech Semester I under Regulations 2015

Branch: EEE, MECH, CIVIL & FT

| S.No | Course Code | Course Title | L | T | P | C |
|-------------|--------------------|--|----------|----------|----------|----------|
| 1 | U15ENG101 | Technical English – I * | 2 | 0 | 2 | 3 |
| 2 | U15MAT102 | Matrices and Calculus * | 3 | 2 | 0 | 4 |
| 3 | U15PHY103 | Engineering Physics * | 3 | 0 | 0 | 3 |
| 4 | U15CHE104 | Engineering Chemistry * | 3 | 0 | 0 | 3 |
| 5 | U15FOC105 | Fundamentals of Computing * | 3 | 0 | 0 | 3 |
| 6 | U15EGR106 | Engineering Graphics ¹ | 2 | 2 | 0 | 3 |
| 7 | U15PCL107 | Physics and Chemistry Laboratory - I ^{2*} | 0 | 0 | 2 | 1 |
| 8 | U15CPL108 | Computer Practices Laboratory * | 0 | 0 | 2 | 1 |
| 9 | U15EPL109 | Engineering Practices Laboratory ^{3*} | 0 | 0 | 2 | 1 |
| | | | 16 | 4 | 8 | 22 |
| | | | 28 hours | | | |

* Common to all branches of study.

¹ The examination will be conducted for 3 hours both on theory and lab mode.

² Laboratory classes on alternate weeks for Physics and Chemistry. The lab examination will be conducted separately for 50 marks each with 2 hours duration.

³ The lab examination will be conducted separately for Group A (Civil & Mechanical) and Group B (Electrical & Electronics) with 50 marks each with 1 ½ hours duration.

Approved by

Chairman, First Year BE/B.Tech. BoS

Dr. K. Karunakaran

Member Secretary, Academic Council

Dr. A.C. Kaladevi

Chairman, Academic Council & Principal

Dr. V. Jayaprakash

SONA COLLEGE OF TECHNOLOGY, SALEM – 636 005

(An Autonomous Institution)

CHOICE BASED CREDIT SYSTEM (CBCS) - UG

Courses of Study for BE/BTech Semester I under Regulations 2015

Branch : CSE, ECE & IT

| S.No | Course Code | Course Title | L | T | P | C |
|----------|-------------|--|----|---|---|----|
| 1 | U15ENG101 | Technical English – I * | 2 | 0 | 2 | 3 |
| 2 | U15MAT102 | Matrices and Calculus * | 3 | 2 | 0 | 4 |
| 3 | U15PHY103 | Engineering Physics * | 3 | 0 | 0 | 3 |
| 4 | U15CHE104 | Engineering Chemistry * | 3 | 0 | 0 | 3 |
| 5 | U15FOC105 | Fundamentals of Computing * | 3 | 0 | 0 | 3 |
| 6 | U15BEE106 | Basic Electrical and Electronics Engineering | 3 | 0 | 0 | 3 |
| 7 | U15PCL107 | Physics and Chemistry Laboratory - I ^{2*} | 0 | 0 | 2 | 1 |
| 8 | U15CPL108 | Computer Practices Laboratory * | 0 | 0 | 2 | 1 |
| 9 | U15EPL109 | Engineering Practices Laboratory 2* | 0 | 0 | 2 | 1 |
| | | | 17 | 2 | 8 | 22 |
| 27 hours | | | | | | |

* Common to all branches of study.

¹ Laboratory classes on alternate weeks for Physics and Chemistry. The lab examination will be conducted separately for 50 marks each with 2 hours duration.

² The lab examination will be conducted separately for Group A (Civil & Mechanical) and Group B (Electrical & Electronics) with 50 marks each with 1 ½ hours duration.

Approved by

Chairman, First Year BE/B.Tech. BoS

Dr. K. Karunakaran

Member Secretary, Academic Council

Dr. A.C. Kaladevi

Chairman, Academic Council & Principal

Dr. V. Jayaprakash

TECHNICAL ENGLISH - I (U15ENG101)

| | | | | |
|---|---|---|---|-----|
| L | T | P | C | M |
| 2 | 0 | 2 | 3 | 100 |

Course Objectives: To enable students to,

1. Frame sentences correctly, both in written and spoken forms of language with accuracy and fluency.
2. Develop and demonstrate listening skills for academic and professional purposes.
3. Draw conclusions on explicit and implicit oral information.
4. Develop effective reading skills and reinforce language skills required for using grammar and building vocabulary.
5. Read for gathering and understanding information, following directions and giving responses.

UNIT I FOCUS ON LANGUAGE

- General Vocabulary
- Prefixes and Suffixes
- Active and Passive voices
- Adjectives, comparative adjectives
- Prepositions and dependent prepositions
- Collocations
- Tenses
- Modal verbs and probability

UNIT II LISTENING -I

- Listening to conversations, welcome speeches, lectures and description of equipment
- Listening to different kinds of interviews (face-to-face, radio, TV and telephone interviews)
- Understanding short conversations or monologues
- Taking down phone messages, orders, notes etc
- Listening for gist, identifying topic, context or function

UNIT III LISTENING – II

- Listening comprehension, entering information in tabular form
- Intensive listening exercises and completing the steps of a process.
- Listening exercises to categorise data in tables.
- Listening to extended speech for detail and inference

UNIT IV READING -I

- Understanding notices, messages, timetables, advertisements, graphs, etc.
- Reading passages for specific information transfer
- Reading documents for business and general contexts and interpreting graphical representations
- Error correction, editing mistakes in grammar, vocabulary, spelling, etc.

UNIT V READING -II

- Reading passage with multiple choice questions, reading for gist and reading for specific information, skimming for comprehending the general idea, meaning and contents of the whole text
- Short reading passage: gap-filling exercise related to grammar, testing the understanding of prepositions, articles, auxiliary verbs, modal verbs, pronouns, relative pronouns and adverbs
- Short reading passage with multiple choice questions, gap-filling exercise testing the knowledge of vocabulary, collocations, dependent prepositions, grammatical structures
- Short reading passages for sentence matching exercises, picking out specific information in a short text

Total: 45 hours

- Listening test will be conducted for 30 marks as internal mode of evaluation.

Text Book

Technical English – I & II, Sonaversity, Sona College of Technology, Salem, 2015.

Extensive Reading

1. The Story of Amazon.com- Sara Gilbert, published by Jaico
2. The Story of Google – Sara Gilbert, published by Jaico

Reference

- Norman Whitby, Business Benchmark – Pre-Intermediate to Intermediate, Students Book, Cambridge University Press, 2006.
- A Course in Communication Skills, P. Kiranmai Dutt, Geetha Rajeevan, C. L. N. Prakash, published by Cambridge University Press India Pvt. Ltd.

MATRICES AND CALCULUS (U15MAT102)

| | | | | |
|---|---|---|---|-----|
| L | T | P | C | M |
| 3 | 2 | 0 | 4 | 100 |

Course Objectives: To enable students to,

1. Find the Eigen values and Eigen vectors of a real matrix and discuss their properties, reduce a real symmetric matrix from quadratic form to canonical form.
2. Explain the three dimensional Cartesian coordinates and discuss the problems in straight line, plane and sphere.
3. Define curvature, calculate the radius of curvature and centre of curvature and find the evolutes, involutes and envelope of curves.
4. Explain functions of several variables, Taylor's series expansion, Jacobians and compute the maximum & minimum values.
5. Explain the double & triple integrals, discuss the change of order of integration and use multiple integrals to find the area & volume.

UNIT I MATRICES

12

Characteristic equation - Eigen values and Eigen vectors of a real matrix - properties - statement of Cayley-Hamilton theorem and its applications - orthogonal transformation of symmetric matrix to diagonal form - quadratic form - reduction of quadratic form to canonical form by orthogonal transformation

UNIT II THREE DIMENSIONAL ANALYTICAL GEOMETRY

12

Direction cosines and ratios, angle between two lines - equation of plane, angle between two planes - equation of the straight line, coplanar lines, skew lines - equation of a sphere, plane section of a sphere, tangent plane, orthogonal spheres

UNIT III DIFFERENTIAL CALCULUS AND ITS APPLICATIONS

12

Curvature in Cartesian co-ordinates, centre and radius of curvature, circle of curvature - evolutes, envelopes, evolute as envelope of normals

UNIT IV FUNCTIONS OF SEVERAL VARIABLES

12

Partial derivatives, total differentiation - differentiation of implicit functions - Taylor's expansion - maxima and minima, constrained maxima and minima by Lagrange's multiplier method - Jacobians-properties

UNIT V MULTIPLE INTEGRALS

12

Evaluation of double and triple integrals in Cartesian and polar co-ordinates - change of order of integration, change of variables from Cartesian to polar co-ordinates - area as a double integral and volume as a triple integral in Cartesian coordinates.

Total: 60 hours

Text Book

1. Jayabharathi.S, “ Matrices and Calculus ”, by Sonaversity, 2015.
2. Veerarajan.T., “Engineering Mathematics”(I Year), Tata McGraw Hill, 4th Edition, 2011

References

1. Kandasamy P., Thilagavathy K., Gunavathy K., “Engineering Mathematics”, (for first year) S.Chand and Co., Ltd., Revised Edition 2011.
2. Erwin Kreyszig., “Advanced Engineering Mathematics”, John Wiley and Sons (Wiley student Edition), 10th Edition, 2010.
3. Grewal B.S., “Higher Engineering Mathematics”, Khanna Publications, 41st Edition, 2011.
4. Bali N.P., Manish Goyal, “Engineering Mathematics”, University Science Press, New Delhi, 9th Edition, 2011.

ENGINEERING PHYSICS (U15PHY103)

| | | | | |
|---|---|---|---|-----|
| L | T | P | C | M |
| 3 | 0 | 0 | 3 | 100 |

Course Objectives: To enable students to,

1. Give brief accounts of architectural acoustics and to explain the properties, production of ultrasonic waves and their application in the field of non-destructive testing and Sonogram
2. Classify the different types of lasers stating examples and outline basic configuration of a laser and its applications.
3. Outline the principle behind fibre optic communication and the electronic devices involved in the transmission and reception of data.
4. Provide an overview of basic wave equations in quantum mechanics and the field electron microscopy.
5. Classify the different types of crystal structures and discuss various crystal defects.

UNIT I ACOUSTICS AND ULTRASONICS

9

Classification of sound, Pitch, Loudness, Intensity level, Phon, Timbre, Reverberation, Reverberation time – Sabine's formula and its importance (no derivation) – Sound absorbing materials - Absorption Coefficient and its determination – Factors affecting acoustics of buildings and their remedies – Production of ultrasonic waves by magnetostriction and piezoelectric methods – acoustic grating – Acoustic impedance - Non Destructive Testing – Ultrasonic flaw detector – A scan display - Sonogram (block diagram).

UNIT II LASERS

9

Principle of spontaneous and stimulated emission – Population inversion - Pumping – Einstein's A and B coefficients derivation – Basic requirements of a laser - Types of lasers – Nd:YAG laser, CO₂ and Semiconductor lasers (homojunction & heterojunction) – Qualitative applications – Lasers in welding, heat treatment and cutting – Medical applications (qualitative) – holography construction and reconstruction.

UNIT III FIBRE OPTICS AND APPLICATIONS

9

Principle and propagation of light in optical fibers – Numerical aperture and acceptance angle – Types of optical fibres (material, refractive index, mode) – Double Crucible Technique of fibre drawing – Splicing – Loss in optical fibre – attenuation, dispersion and bending - Fibre optic communication system (Block diagram) – Fibre optic sensors - temperature and displacement sensor - Endoscope.

UNIT IV QUANTUM PHYSICS

9

Introduction – Compton effect theory and experimental verification – Matter waves – Schrodinger's time independent and time dependent wave equation - Physical significance of the wave function – Particle in a one dimensional box – Evolution of microscope - Electron microscope – Comparison of optical and electron microscope - Scanning electron microscope .

UNIT V CRYSTALLOGRAPHY

9

Crystalline Solids – Amorphous solids – Space Lattice - Unit cell – Bravais lattice – Lattice planes – Miller indices – d spacing in cubic lattice – Calculation of number of atoms per unit cell – Atomic radius – Coordination number and atomic packing factor for SC, BCC, FCC and HCP Structures – Polymorphism and allotropy – Crystal imperfections: point , line and surface defects – burger vector.

Total: 45 hours

Text book

1. Engineering Physics, Sonaversity, Sona College of Technology, Salem (Revised edition, 2015).
2. M. Arumugam, 'Engineering Physics' Anuradha Publications, Kumbakonam, (2006).

References

1. B. K. Pandey and S. Chaturvedi, Engineering Physics , Cengage Learning India Pvt. Ltd., Delhi, 2012.
2. R. K. Gaur and S.C. Gupta, Engineering Physics, Dhanpat Rai Publications, New Delhi, 2003.
3. Rajendran.V and Marikani. A, Engineering Physics, Tata Mc Graw Hill Publications Ltd, III Edition, New Delhi, 2004.
4. Palanisamy, P.K., Engineering Physics, Scitech publications, Chennai, 2007.
5. Jayakumar. S, Engineering Physics, R.K. Publishers, Coimbatore, 2003.
6. M.N. Avadhanulu and PG Kshirsagar, A Text book of Engineering Physics, S.Chand and company Ltd., New Delhi, 2005.

ENGINEERING CHEMISTRY (U15CHE104)

| L | T | P | C | M |
|---|---|---|---|-----|
| 3 | 0 | 0 | 3 | 100 |

Course Objectives: To enable students to,

- Classify the impurities of water, their removal methods and explain the conditioning methods for domestic and industrial uses.
- Explain the principles and applications of electrochemistry to engineering field.
- Classify the types of corrosion and their mechanism and discuss the methods of corrosion control.
- Explain the basics of nanochemistry, synthesis, properties and applications of Nano materials in engineering and technology.
- Discuss the role and importance of chemistry in daily life.

UNIT I WATER TECHNOLOGY

9

Introduction, Characteristics – hardness – estimation of hardness by EDTA method, alkalinity and its estimation, Boiler feed water – requirements – disadvantages of using hard water in boilers, internal conditioning (colloidal, phosphate, calgon and carbonate conditioning methods), external conditioning – zeolite process, demineralization process, desalination of brackish water by reverse osmosis, Domestic water treatment – screening, sedimentation, coagulation, aeration, sand filtration and disinfection methods - Chlorination, ozonation and UV treatment.

UNIT II ELECTROCHEMISTRY

9

Electrode potential – Nernst Equation – derivation and problems based on single electrode potential calculation, reference electrodes – standard hydrogen electrode - calomel electrode, Ion selective electrode – glass electrode – measurement of pH, electrochemical series – significance, electrolytic and electrochemical cells – reversible and irreversible cells, EMF – measurement of emf – potentiometric titrations (redox – Fe^{2+} vs dichromate), conductometric titrations (acid-base – HCl vs NaOH).

UNIT III CORROSION AND CORROSION CONTROL

9

Chemical corrosion - Pilling-Bedworth rule, electrochemical corrosion – mechanism - galvanic corrosion – differential aeration corrosion, factors influencing corrosion – corrosion control – sacrificial anode and impressed cathodic current methods – corrosion inhibitors, protective coatings – preliminary treatment – Paints – constituents and functions - surface conversion coatings – Galvanizing and Tinning.

UNIT IV NANOCHEMISTRY

9

Basics - distinction between molecules, nanoparticles and bulk materials; size-dependent properties. nanoparticles: nano cluster, nano rod, nanotube (CNT) and nanowire. Synthesis: precipitation, thermolysis, hydrothermal, solvothermal, electrodeposition, chemical vapour deposition, Solgel technique, Properties and applications.

UNIT V CHEMISTRY IN DAILY LIFE

9

Introduction – role and importances of chemistry in day to day life, Food additives – fruits, vegetables, milk and egg – constituents and benefits, balanced food – minerals rich, carbohydrates rich and protein rich, chemistry of soft drinks – soda and beverages, Oils and fats – MUFA, PUFA and SATFA – properties and analysis of oils and fats, soaps and detergents, antioxidants, adulterants – simple tests for the identification of adulterants in food stuffs, Significances of calcium, iron, iodine and impacts of fluorides on human health.

Total: 45 hours

Text Books

1. K. Karunakaran et al., “Engineering Chemistry”, Sonaversity, Sona College of Technology, Salem, 2015.
2. P.C.Jain and Monica Jain, “Engineering Chemistry” Dhanpat Rai Pub, Co., New Delhi , 2010.

Reference Books

1. Kannan P., Ravikrishnan A., "Engineering Chemistry", Sri Krishna Hi-tech Publishing Company Pvt. Ltd., Chennai, 2009.
2. B. Sivasankar "Engineering Chemistry" Tata McGraw-Hill Pub.Co.Ltd, New Delhi (2008).
3. Ozin G. A. and Arsenault A. C., "Nanochemistry: A Chemical Approach to Nanomaterials", RSC Publishing, 2005.
4. ARUN BAHL and BAHL,"A Text Book of Organic Chemistry", S. CHAND & Company Ltd., New Delhi, 2003.

FUNDAMENTALS OF COMPUTING (U15FOC105)

| L | T | P | C | M |
|---|---|---|---|-----|
| 3 | 0 | 0 | 3 | 100 |

Course Objectives: To enable students to,

After successful completion of the course, the students would be able to

- Write and execute C programs for simple applications

UNIT I INTRODUCTION TO PROBLEM SOLVING AND COMPUTERS 8

Problem formulation , Problem Solving methods, Need for logical analysis and thinking – Algorithm – Pseudo code – Flow Chart. Need for computer languages, Generation and Classification of Computers- Basic Organization of a Computer –Number System – Binary – Decimal – Conversion – Problems.

UNIT II C PROGRAMMING BASICS 8

C Character set, Identifiers and Keywords, Data Types, Declarations, Expressions, Statements and Symbolic constants, Operators – Arithmetic Operators – Unary operators – Relational and Logical Operators – Assignment operators – Conditional operators.

Managing Input and Output operations, preprocessor directives and storage classes.

UNIT III CONTROL STATEMENTS, ARRAYS AND STRINGS 9

Unconditional statements, conditional statements, branching and looping statements.

Arrays – Initialization – Declaration – One dimensional and Two dimensional arrays. String - String operations – String Arrays. Simple programs- sorting- searching – matrix operations and solving simple scientific and statistical problems.

UNIT IV FUNCTIONS AND POINTERS 9

Function – Library functions and user-defined functions – Function prototypes and function definitions – Call by value – Call by reference – Recursion – Pointers - Definition – Initialization – Pointers arithmetic – Pointers and arrays- Example Problems. Pointers and Functions.

Introduction – need for structure data type – structure definition – Structure declaration – Structure within a structure – Passing structures to functions – Array of structures – Pointers to structures. Union - Programs using structures and Unions.

Total : 45 hours

Text Book

1. Deitel and Deitel, “C How to Program”, Pearson Education, New Delhi, 2011.
2. e-books on C

Reference books

1. Byron S Gottfried, “Programming with C”, Schaum’s Outlines, Second Edition, Tata McGraw-Hill, 2006.
2. Kernighan,B.W and Ritchie,D.M, “The C Programming language”, Second Edition, Pearson Education, 2006.
3. Yashavant P. Kanetkar. “Let Us C”, BPB Publications, 2011.
4. Anita Goel and Ajay Mittal, “Computer Fundamentals and Programming in C”, Dorling Kindersley (India) Pvt. Ltd., Pearson Education in South Asia, 2011.

ENGINEERING GRAPHICS (U15EGR106)

| L | T | P | C | M |
|---|---|---|---|-----|
| 2 | 2 | 0 | 3 | 100 |

Course Objectives: To enable students to,

- Predict the Construction of various curves in civil elevation plan and Machine components.
- Draw the projection of three dimensional objects representation of machine structure and explain standards of orthographic views by different methods.
- Analyze the principles of projection of various planes by different angle to project points, lines and planes.
- Draw the principles of projection of simple solid by the axis is inclined to one reference plane by change of position method.
- Plan the interior components of machinery (or) buildings by sectioning the solid, and to study the development of simple solids for fabrication of sheet metals.

CONCEPTS AND CONVENTIONS (Not for Examination)

2

Importance of graphics in engineering applications, Use of drafting instrument, BIS conventions and specifications - Size, layout and folding of drawing sheets, Lettering and dimensioning.

COMPUTER AIDED DRAFTING (Not for Examination)

6

Importance 2d Drafting, sketching, modifying, transforming and dimensioning

UNIT I PLANE CURVES (Free hand sketching)

10

Curves used in engineering practices

Conics, Construction of ellipse, Parabola and hyperbola by eccentricity method, Construction of cycloid, construction of involutes of square and circle, Drawing of tangents and normal to the above curves.

UNIT II ISOMETRIC TO ORTHOGRAPHIC VIEWS

10

(Free hand sketching)

Representation of three dimensional objects, General Principles of Orthographic projection, Need for importance of multiple views and their placement, First angle projection, layout of views, Developing visualization skills through free hand sketching of multiple views from pictorial views of objects.

UNIT III PROJECTION OF POINTS, LINES AND PLANE SURFACES

10

(Free hand sketching and 2D Software)

Projection of points, Projection of straight lines located in the first quadrant, Determination of true lengths and true inclinations, Projection of polygonal surface and circular lamina inclined to both reference planes.

UNIT IV PROJECTION OF SOLIDS

12

(Free hand sketching and 2D Software)

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 V SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES

10

(Free hand sketching and 2D Software)

Sectioning of simple solids like prisms, pyramids, cylinder and cone in simple vertical position by cutting planes inclined to one reference plane and perpendicular to the other, (Obtaining true shape of section is not required). Development of lateral surfaces of simple and truncated solids, Prisms, pyramids, cylinders and cones.

Total: 60 hours

Text Book

1. Engineering Graphics and Drawing, Revised edition 2012, Sonaversity, Sona College of Technology, Salem.
2. Modeling software packages like solid edge, unigraphics and Auto CAD

References

1. Dhananjay A. JoIhe, Engineering Drawing with an introduction to AutoCAD, Tata McGraw Hill Publishing Company Limited, 2008.
2. Basant Agarwal and Agarwal C.M., Engineering Drawing, Tata McGraw Hill Publishing Company Limited, New Delhi, 2008.
3. K. R. Gopalakrishnana, Engineering Drawing (Vol. I & II), Subhas Publications, 1998.

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING (U15BEE106)

| L | T | P | C | M |
|---|---|---|---|-----|
| 3 | 0 | 0 | 3 | 100 |

(Common to ECE, CSE & IT Branches)

Course Objectives: To enable students to,

- To analyze the various DC circuits and find the circuit parameters.
- To introduce the principles of AC fundamentals.
- To familiarize the relationship between Electric and Magnetic circuits.
- To study the basics of electronic devices and its applications.
- To study various number systems and to realize the logic functions by using various gates.

UNIT I DC FUNDAMENTALS

12

Electrical Components and parameters – Resistance, Conductance – factors affecting resistance, Ohm’s Law, Limitations of Ohm’s Law, Kirchhoff’s’ Laws, series– parallel resistive circuits, comparison of series and parallel circuits, Star - Delta Transformation – Problems.

UNIT II AC FUNDAMENTALS

12

AC Waveforms - Standard Terminologies – RMS and Average value of Sinusoidal, Triangular and Square wave forms - Form Factor, Peak Factor. Single Phase AC Circuits – RL, RC, RLC series and parallel circuits– Impedance, Power, Power factor, Series and Parallel Resonance - Problems. Introduction to three phase AC circuits.

UNIT III MAGNETIC CIRCUITS

12

Introduction–Properties of Magnets, Laws of Magnetism, flux, flux density, Field strength, Permeability, Reluctance, Permeance, Types of Magnetic circuits – Comparison of Magnetic and Electric Circuits. Self and Mutual Inductance – Self and Mutually induced emf – Problems.

UNIT IV BASIC ELECTRONICS

12

Energy Band Diagram for Conductors, Semiconductors and Insulators. Types of semiconductor, Theory of PN Junction. PN Junction Diode-VI characteristics - half wave and full wave rectifier. Zener Diode-VI characteristics – Voltage regulator.

UNIT V DIGITAL ELECTRONICS

12

Number Systems, Conversion between number systems. Binary addition, Subtraction using complement's, BCD addition. Boolean laws and theorems, Logic gates – Implementation of logical functions using gates – Realization using universal gates.

Total: 60 hours

Text Books

1. B. L. Theraja., A. K. Theraja, “A Text book of Electrical Technology”, S. Chand & Co Ltd.
2. Muthusubramanian R, Salivahanan S, “Basic Electrical and Electronics Engineering” 2nd Edition, Tata McGraw-Hill publishing company limited.
3. Sonaversity, “Basic Electrical and Electronics Engineering”.

Reference Books

1. Mehta.V. K, Rohit Metha, “Principles of Electrical Engineering and Electronics”, S. Chand & Co. Ltd, 2011
2. Gothman, William,” Digital Electronics” 2nd Edition, PHI Publications.
3. Smarajit Ghosh “Fundamentals of Electrical and Electronics Engineering”, 2nd Edition, PHI publications.

PHYSICS AND CHEMISTRY LABORATORY I (U15PCL107)

PHYSICS PART

| | | | | |
|---|---|---|---|----|
| L | T | P | C | M |
| 0 | 0 | 2 | 1 | 50 |

(Common to all branches)

List of Experiments

1. Air wedge apparatus – Determination of thickness of a thin wire using interference.
2. Ultrasonic interferometer – Determination of ultrasonic velocity and compressibility of the given liquid.
3. Non-uniform bending apparatus – Determination of Young's modulus.
4. Lee's disc apparatus – Determination of thermal conductivity of a bad conductor.
5. Spectrometer – Determination of dispersive power of a prism.
6. Diode laser – Determination of laser wavelength, particle size (lycophodium powder), acceptance angle and numerical aperture (optical fibre).

(Any five experiments)

PHYSICS AND CHEMISTRY LABORATORY I (U15PCL107)

CHEMISTRY PART

| | | | | |
|---|---|---|---|----|
| L | T | P | C | M |
| 0 | 0 | 2 | 1 | 50 |

(Common to all branches)

List of Experiments

1. Estimation of hardness of Water by EDTA method.
2. Estimation of alkalinity of Water sample by indicator method.
3. Estimation of hydrochloric acid by pH metry.
4. Conductometric titration of strong acid vs strong base (HCl vs NaOH).
5. Estimation of ferrous iron by potentiometry.
6. Determination of corrosion rate by weight loss measurements.

(Any five experiments)

COMPUTER PRACTICES LABORATORY (U15CPL108)

| L | T | P | C | M |
|---|---|---|---|-----|
| 0 | 0 | 2 | 1 | 100 |

Course Objectives: To enable students to,

- Design and develop simple programs using branching, looping statements
- Develop programs using functions, arrays, structures and recursion
- Implement programs using string handling
- Write programs using pointers

LIST OF EXPERIMENTS

1. Program using Input, Output and assignment statements.
2. Programs using Branching statements
3. Programs using Looping statements
4. Program using Functions
5. Program using Arrays
6. Program using Structures
7. Program using Strings
8. Program using Pointers (both data pointers and function pointers)
9. Program using Recursion

Total : 45 hours

ENGINEERING PRACTICES LABORATORY (U15EPL109)

| | | | | |
|---|---|---|---|-----|
| L | T | P | C | M |
| 0 | 0 | 2 | 1 | 100 |

Course Objectives: To enable students to,

- Plan the pipe connections in PVC, G.I pipes.
- Analyze to separate the woods with tools and made of several pieces with proper types of joints using tools and machines.
- Demonstrate and choose the removing materials from metal components and assemble the components. Sheet metals.
- Construct to attach the two metals by melting their edges by an electric arc welding.
- Demonstrate the working and principles of Residential house wiring and Fluorescent lamp wiring
- Analyze the functions of logic gates (AND, OR, NOT, NAND, NOR and Ex-OR).

LIST OF EXPERIMENTS

GROUP A (CIVIL & MECHANICAL)

I CIVIL ENGINEERING PRACTICE

9

PLUMBING WORKS

- a. Basic pipe connections (PVC) involving the fittings like Valves, Taps, and Bends.
- b. Mixed pipe (PVC and G.I) connections involving the fitting like Valves, Taps, and Bends

CARPENTRY WORKS

- a. Planning
- b. Lap joint
- c. Cross lap joint

SHEET METAL WORK

- a. Square tray
- b. Funnel

FITTING WORK

- a. L joint
- b. V-joint

WELDING

- a. Butt joint
- b. Lap joint
- c. Tee joint

MACHINE ASSEMBLY PRACTICE

- a. Air conditioner repair and maintenance
- b. Automobile differential unit and maintenance
- c. Centrifugal pump

GROUP B (ELECTRICAL & ELECTRONICS)**III ELECTRICAL ENGINEERING PRACTICE****10**

1. Study of Resistor, Inductor and capacitor-ratings-coding-series and parallel equivalence.
2. Residential house wiring
3. Fluorescent lamp wiring.
4. Stair-case Wiring and Door bell wiring
5. Measurement of circuit parameters for RLC series & Parallel circuit.
6. Measurement of Energy using Energy meter for Single Phase system.
7. Study of offline and online UPS

IV ELECTRONICS ENGINEERING PRACTICE

13

1. Verification of Ohm's Law
2. Measurement of Amplitude and frequency of AC wave forms using CRO.
3. Verification of logic gates (AND, OR, NOT, NAND, NOR and Ex-OR).
4. Generation of Clock Signal using IC 555 timer.
5. Soldering practice - Components Devices and Circuits - Using general purpose PCB.
6. Study of F.M Radio and Emergency lamp.

Total: 45 hours