CBCS SYLLABUS FOR PHYSICS CYCLE 2018 -19

CALCULUS AND LINEAR ALGEBRA

Semester I /II CIE Marks: 40

Course Code : 18 MATI1 SEE Marks: 60

Teaching Hours/week (L:T:P) =: 3:2:0 Exam Hours': 03 Credits : 04

Course Learning Objectives: This course Calculus and Linear Algebra (18MAT11) will enable students: ¢ To familiarize the important tools of calculus and differential equations that are essential in all branches of engineering. ¢ To develop the knowledge of matrices and linear algebra in a comprehensive manner.

MODULE-I

Differential Calculus-1: Review of elementary differential calculus, Polar curves - angle between the radius vector and tangent, angle between two curves, pedal equation. Curvature and radius of curvature- Cartesian and polar forms; Centre and circle of curvature (All without proof-formulae only) —applications to evolutes and involutes. (RBT Levels: L1 & L2)

MODULE-II

Differential Calculus-2: Taylor's and Maclaurin's series expansions for one variable (statements only), indeterminate forms - L'Hospital's rule. Partial differentiation; Total derivatives-differentiation of composite functions. Maxima and minima for a function of two variables; Method of Lagrange multipliers with one subsidiary condition. Applications of maxima and minima with illustrative examples. Jacobians-simple problems.

(RBT Levels: L1 & L2)

MODULE-III

Integral Calculus: Review of elementary integral calculus. Multiple integrals: Evaluation of double and triple integrals. Evaluation of double integrals- change of order of integration and changing into polar co- ordinates. Applications to find area volume and centre of gravity Beta and Gamma functions: Definitions, Relation between beta and gamma functions and simple problems.

(RBT Levels: L1 & L2)

MODULE-IV

Ordinary differential equations (ODE's) of first order: Exact and reducible to exact differential equations. Bernoulli's equation. Applications of ODE's-orthogonal trajectories, Newton's law of cooling and L- Rcircuits. Nonlinear differential equations: Introduction to general and singular solutions ; Solvable for p only; Clairaut's and reducible to Clairaut's equations only. (RBT Levels: L1, L2 & L3)

MODULE-V

Linear Algebra: Rank of a matrix-echelon form. Solution of system of linear equations — consistency. Gauss-elimination method, Gauss —Jordan method and Approximate solution by Gauss-Seidel method. Eigen values and eigenvectors- Rayleigh's power method. Diagonalization ofa square matrix of order two. (RBT Levels : L1, L2 & L3)

Textbooks: 1. B.S. Grewal: Higher Engineering Mathematics, Khanna Publishers, 43rd Ed., 2015.

2. E. Kreyszig: Advanced Engineering Mathematics, John Wiley & Sons, 10th Ed.(Reprint), 2016.

Reference books:

1. C.Ray Wylie, Louis C.Barrett : "Advanced Engineering Mathematics", 6th Edition, 2. McGraw-Hill Book Co., New York, 1995.
2. James Stewart : "Calculus —Early Transcendentals", Cengage Learning India Private Ltd., 2017.
3. B.V.Ramana: "Higher Engineering Mathematics" 11th Edition, Tata McGraw-Hill, 2010.
4. Srimanta Pal & Subobh C Bhunia: "Engineering Mathematics", Oxford University Press, 3rd Reprint, 2016.
5. Gupta C.B., Singh S.R. and Mukesh Kumar: "Engineering Mathematics for Semester I & II", Mc-Graw Hill Education (India) Pvt.Ltd., 2015.

Web links and Video Lectures: 1. http://nptel.ac.in/courses.php?discipline[ID=111 2. http://www.class-central.com/subject/math(MOOCs) 3. http://academicearth.org/ 4. VTUEDUSAT PROGRAMME - 20

Course Outcomes: On completion of this course, students are able to:

CO1 : Apply the knowledge of calculus to solve problems related to polar curves and its applications in determining the bentness ofa curve.

CO2 : Learn the notion of partial differentiation to calculate rates of change of multivariate functions and solve problems related to composite functions and Jacobians.

CO3 : Apply the concept of change of order of integration and variables to

evaluate multiple integrals and their usage in computing the area and volumes.

CO4 : Solve first order linear/nonlinear differential equation analytically using

standard methods

CO5 : Make use of matrix theory for solving system of linear equations and

compute eigenvalues and eigenvectors required for matrix diagonalization process.

Question Paper Pattern:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 60.

The question paper will have ten full questions carrying equal marks. Each full question carries 20 marks.

There will be two full questions (with a maximum of four sub questions) from each module.

Each full question will have sub questions covering all the topics under a module.

The students will have to answer five full questions, selecting one full question from each module.

ENGINEERING PHYSICS

Semester I/II CIE Marks' :40

Course Code : 18PHY12/22 SEE Marks: 60

Teaching Hours/week (L:T:P) =: 3:2:0 Exam Hours: 03 Credits : 04

Course Learning Objectives: This course (18PHY12/22) will enable students to e Learn the basic concepts in Physics which are very much essential in understanding and solving engineering related challenges. ¢ Gain the knowledge of newer concepts in modern physics for the better appreciation of modern technology

MODULE-I

Oscillations and Waves Free Oscillations: Definition of SHM, derivation of equation for SHM, Mechanical simple harmonic oscillators (mass suspended to spring oscillator), complex notation and phasor representation of simple harmonic motion. Equation of motion for free oscillations, Natural frequency of oscillations.

Damped and forced oscillations: Theory of damped oscillations: over damping, critical & under damping, quality factor. Theory of forced oscillations and resonance, Sharpness of resonance. One example for mechanical resonance.

Shock waves: Mach number, Properties of Shock waves, control volume. Laws of conservation of mass, energy and momentum. Construction and working of Reddy shock tube, applications of shock waves. Numerical problems

(RBT Levels : L1, L2 & L3)

MODULE-II

Elastic properties of materials:

Elasticity: Concept of elasticity, plasticity, stress, strain, tensile stress, shear stress, compressive stress, strain hardening and strain softening, failure (fracture/fatigue), Hooke's law, different elastic moduli: Poisson's ratio, Expression for Young's modulus (Y), Bulk modulus (K) and Rigidity modulus (n) interms of and B. Relation between Y, nand K, Limits of Poisson's ratio.

Bending of beams: Neutral surface and neutral plane, Derivation of expression for bending moment. Bending moment of a beam with circular and rectangular cross section. Single cantilever, derivation of expression for Young's' modulus. Torsion of cylinder: Expression for couple per unit twist of a solid cylinder (Derivation), Torsional pendulum-Expression for period of oscillation. Numerical problems.

(RBT Levels : L1, L2 & L3)

MODULE- III

Maxwell's equations, EM waves and Optical fibers Maxwell's equations: Fundamentals of vector calculus. Divergence and curl of electric field and magnetic field (static), Gauss' divergence theorem and Stokes' theorem. Description of laws of electrostatics, magnetism and Faraday's laws of EMI. Current density & equation of Continuity; displacement current (with derivation) Maxwell's equations in vacuum.

EM Waves: The wave equation in differential form in free space (Derivation of the equation using Maxwell's equations), Plane electromagnetic waves in vacuum, their transverse nature, polarization of EM waves (Qualitative).

Optical fibers: Propagation mechanism, angle of acceptance. Numerical aperture. Modes of propagation and Types of optical fibers. Attenuation: Causes of attenuation and Mention of expression for attenuation coefficient. Discussion of block diagram of point to point communication. Merits and demerits Numerical problems.

(RBT Levels : L1 & L2)

MODULE IV

Quantum Mechanics and Lasers Quantum mechanics: Introduction to Quantum mechanics, Wave nature of particles, Heisenberg's uncertainty principle and applications (non confinement of electron in the nucleus), Schrodinger time independent wave equation, Significance of Wave function, Normalization, Particle in a box, Energy eigen values ofa particle in a box and probability densities.

Lasers: Review of spontaneous and stimulated processes, Einstein's coefficients (derivation of expression for energy density). Requisites of a Laser system. Conditions for laser action. Principle, Construction and working of CO, and semiconductor Lasers. Application of Lasers in Defense (Laser range finder) and Engineering (Data storage). Numerical problems

(RBT Levels : L1, L2 & L3)

MODULE-V

Material science Quantum Free electron theory of metals: Review of classical free electron theory, mention of failures. Assumptions of Quantum Free electron theory, Mention of expression for density of states, Fermi-Dirac statistics (qualitative), Fermi factor, Fermi level, Derivation of the expression for Fermi energy, Success of QFET. Physics of Semiconductor: Fermi level in intrinsic semiconductors, Expression for concentration of electrons in conduction band, Hole concentration in valance band (only mention the expression), Conductivity of semiconductors(derivation), Hall effect, Expression for Hall coefficient (derivation) Dielectric materials: polar and non-polar dielectrics, internal fields in a solid, Clausius-Mossotti equation(Derivation), mention of solid, liquid and gaseous dielectrics with one example each. Application of dielectrics in transformers. Numerical problems.

(RBT Levels : L1, L2 & L3)

Textbooks:

1. A Text book of Engineering Physics- M.N. Avadhanulu and P.G. Kshirsagar, 10th revised Ed, S. Chand & Company Ltd, New Delhi.
2. Engineering Physics-Gaur and Gupta Dhanpat Rai Publications-2017.
3. Concepts of Modern Physics-Arthur Beiser: 6th Ed, Tata McGraw Hill Edu Pvt Ltd- New Delhi 2006.

Reference books:

1. Introduction to Mechanics, MK Verma: 2nd Ed, University Press(India) Pvt Ltd, Hyderabad 2009.
2. Lasers and Non Linear Optics, BB laud, 3rd Ed, New Age International Publishers 2011.
3. Solid State Physics-S O Pillai, 8th Ed New Age International Publishers-
4. Shock waves made simple- Chintoo S Kumar, K Takayama and KPJ Reddy: Willey India Pvt. Ltd., New Delhi, 2014.
5. Introduction to Electrodynamics, David Griffiths, 4th Ed, Cambridge University Press 2017.

Course Outcomes:

Upon completion of this course, students will be able to Understand various types of oscillations and their implications, the role of Shock waves in various fields and Recognize the elastic properties of materials for engineering applications.

2. Realize the interrelation between time varying electric field and magnetic field, the transverse nature of the EM waves and their role in optical fiber communication.

3. Compute Eigen values, Eigen functions, momentum of Atomic and subatomic particles using Time independent 1-D Schrodinger's wave equation.

4. Apprehend theoretical background of laser, construction and working of different types of laser and its applications in different fields 5. | Understand various electrical and thermal properties of materials like conductors, semiconductors and dielectrics using different theoretical models.

Question paper pattern:

Note:- The SEE question paper will be set for 100 marks and the marks will be proportionately reduced to 60. ° The question paper will have ten full questions carrying equal marks.

° Each full question consisting of 20 marks.

° There will be two full questions (with a maximum of four sub questions) from each module.

° Each full question will have sub question covering all the topics under a module.

° The students will have to answer five full questions, selecting one full question from each module.

BASIC ELECTRICAL ENGINEERING

Semester : I/II CIE Marks' : 40

Course Code : I8ELE13/23 SEE Marks _ : 60

Teaching Hours/week (L:T:P) —: 2:2:0 Exam Hours': 03 Credits : 03

Lecture hours per module: Six hours and Tutorials per module: one of 2 hours

Course Objectives: To explain Ohm's law and Kirchhoff's laws used for the analysis of DC circuits.

To explain fundamentals of AC circuits and the behaviour of R, L and Cand their combinations in AC circuits.

To discuss three phase balanced circuits.

To explain principle of operation, construction and performance of electrical machines such as single phase transformer, DC machines, synchronous generator and three phase induction motor.

To introduce concepts of electrical wiring, circuit protecting devices and earthing.

MODULE-I

D.C.Circuits: Ohm's Law and Kirchhoff's Laws, analysis of series, parallel and series- parallel circuits excited by independent voltage sources. Power and Energy. A.C. Fundamentals: Generation of sinusoidal voltage, frequency of generated voltage, definition and numerical values of average value, root mean square value, form factor and peak factor of sinusoidally varying voltage and current, phasor representation of alternating quantities.

(RBT Levels : L1, L2, L3 & L4)

MODULE - 2

Single Phase Circuits: Analysis, with phasor diagram, of circuits with R, L, C, R-L, RC, R-L-C for series and parallel configurations. Real power, reactive power, apparent power and power factor. Three Phase circuits: Advantages of 3-phase power, Generation of 3-phase power, Three-phase balanced circuits, voltage and current relations in star and delta connections. Measurement of three phases power using two wattmeter method.

(RBT Levels : L1, L2, L3 & L4)

MODULE -3

Single Phase Transformers: Necessity of transformer, Principle of operation, Types and construction of transformers. emf equation, losses, variation of losses with respect to load, efficiency, Condition for maximum efficiency. Domestic Wiring: Service mains, meter board and distribution board. Brief discussion on concealed conduit wiring. Two-way and three-way control. Elementary discussion on circuit protective devices: Fuse and Miniature Circuit Breaker (MCB's), electric shock, precautions against shock. Earthing: Pipe and Plate earthing.

(RBT Levels : L1, L2 & L3)

MODULE - 4

DC Generators: Principle of operation, Construction of D.C. Generators. Expression for induced emf,Types of D.C. Generators,Relation between induced emf and terminal voltage. DC motors: Principle of operation,Back emf,Torque equation, Types of dc motors, Characteristics of dc motors (shunt and series motors only) and Applications.

(RBT Levels : L1, L2 & L3)

MODULE — 5

Three Phase Synchronous Generators: Principle of operation, Constructional details, Synchronous speed, Frequency of generated voltage, emf equation, Concept of winding factor (excluding the derivation and calculation of distribution and pitch factors). Three Phase Induction Motors: Principle of operation, Generation of rotating magnetic field, Construction

and working of three-phase induction motor, Slip and its significance. Necessity of starter, star-delta starter.

(RBT Levels : L1, L2 & L3)

Textbooks: 1 Basic Electrical Engineering, D C Kulshreshtha, Tata McGraw Hill, Revised First Edition.

2 Principles of Electrical Engineering & Electronics, V.K. Mehta, Rohit Mehta, S.ChandPublications.

Reference Books:

1 Fundamentals of Electrical Engineering and Electronics, B. L. Theraja, S. Chand & Company Ltd, Reprint Edition 2013.

2 Electrical Technology, E. Hughes, International Students 9th Edition, Pearson, 2005.

3 Basic Electrical Engineering, D. P. Kothari and I. J. Nagrath, Tata McGraw Hill, 2017.

Course Outcomes:

At the end of the course the student will be able to:

. Analyse D.C andA.C circuits.

° Explain the principle of operation andconstruction of single phase transformers. Explain the principle of operation andconstruction of DC machines and synchronous machines.

Explain the principle of operation and construction of three phase induction motors.

Discuss concepts of electrical wiring, circuit protecting devices and earthing.

Graduate Attributes (As per NBA): Engineering Knowledge, Problem Analysis.

Question paper pattern:

The question paper will have ten questions. Each question is set for 20 marks.

There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub questions), should have a mix of topics under that module.

The students have to answer 5 full questions, selecting one full question from each module.

ELEMENTS OF CIVIL ENGINEERING AND MECHANICS

Semester : I/II CIE Marks _ : 40

Course Code : 18CIV14/24 SEE Marks _ : 60

Teaching Hours/week (L:T:P) —: 2:2:0 Exam Hours: 03 Credits : 03

Course Objectives:

The objectives of this course are To make students to learn Scope of various fields of Civil Engineering, basics of civil engineering concepts and importance of infrastructure development. ¢ To develop a student's ability to analyze the problems involving Forces and Moments with their applications, Centroid and Moment of inertia and Kinetics of bodies.

Module-1

Introduction to Civil Engineering: Scope of different fields of Civil Engineering; Surveying, Building Materials, Construction Technology, Geotechnical Engineering, Structural Engineering, Hydraulics, Water Resources & Irrigation Engineering, Transportation Engineering and Environmental Engineering. Role of Civil Engineers in the Infrastructural development, effect of infrastructural facilities on social-economic development ofa country. (RBT Level: L1)

Introduction to Engineering Mechanics: Basic concepts of idealization- Particle, Continuum and Rigid Body; Force; Systems of Forces; Basic Principles — Physical Independence of forces, Superposition, Transmissibility, Newton's Laws of Motion, Resolution and Composition of forces, Law of parallelogram of forces, Polygonal law, Resultant of Concurrent coplanar force systems, Coplanar Non Concurrent Force System: Moment of a Forces, couple, Varignon's theorem, Resultant of Coplanar non-concurrent force system.

(RBT Level : L1, L2 & L3)

Module-2

Equilibrium of Forces: Free body diagrams, Lami's theorem, Equations of Equilibrium, equilibrium of concurrent and non concurrent coplanar force systems. (RBT Level: L1, L2 & L3)

Friction: Types of friction, Laws of dry Friction, Limiting friction, Concept of Static and Dynamic Friction; Numerical problems on motion of single and connected bodies on planes, wedge friction, ladder friction, rope and Pulley systems. (RBT Level: L1, L2 & L3)

Module-3

Support Reactions: Types of Loads and Supports, statically determinate and indeterminate beams, Support Reaction in beams, Numerical problems on support reactions for statically determinate beams (Point load, uniformly distributed & uniformly varying loads and Moments) (RBT Level : L1, L2 & L3)

Analysis of Simple trusses: Types of trusses, Analysis of statically determinate trusses using method of joints and method of sections. (RBT Level : L1, L2 & L3)

Module-4

Centroid: Centroid of simple figures from first principle, Centroid of composite/built-up sections; Moment of Inertia: Introduction, second moment of area of plane sections from first principles, Parallel axes and perpendicular axes Theorems, Radius of gyration, Moment of inertia of composite area and built-up sections. Concept of Product of Inertia (No Problems)

(RBT Level : L1, L2 & L3)

Module-5

Kinematics: Definitions, Displacement, Average velocity, Instantaneous velocity, Speed, Acceleration, Average acceleration, Variable acceleration, Acceleration due to gravity, Newton's Laws of Motion. Rectilinear Motion—Numerical problems. Curvilinear Motion-Super elevation, Projectile Motion, Relative motion, Numerical problems. Motion under gravity, Numerical problems,

(RBT Level : L1, L2 & L3)

Kinetics: D'Alembert's principle and its applications in plane motion and connected bodies including pulleys (RBT Level : L2 & L3)

Course outcomes: After a successful completion of the course, the student will

be able to:

1. Mention the applications of various fields of Civil Engineering.
2. Compute the resultant of given force system subjected to various loads.

   Comprehend the action of Forces, Moments and other loads on systems of rigid bodies and compute the reactive forces that develop as a result of the external loads.
3. Locate the Centroid and compute the Moment of Inertia of regular and built-up sections.
4. Express the relationship between the motion of bodies and analyze the bodies in motion. Question paper pattern:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 60.

The question paper will have ten full questions carrying equal marks.

Each full question consisting of 20 marks.

There will be two full questions (with a maximum of three sub questions) from each module.

Each full question will have sub question covering all the topics under a module.

The students will have to answer five full questions, selecting one full question from each module.

Textbooks:

R. C. Hibbler, Engineering Mechanics: Principles of Statics and Dynamics, Pearson Press.

2. Bansal R.K., AText Book of Engineering Mechanics, Laxmi Publications.

Reference Books:

1. Andy Ruina and Rudra Pratap , Introduction to Statics and Dynamics, Oxford University Press.

2. Reddy Vijaykumar K. and K. Suresh Kumar, Singer's Engineering Mechanics.

3. EF. P. Beer and E. R. Johnston, Mechanics for Engineers, Statics and Dynamics, McGraw Hill.

4. Irving H. Shames, Engineering Mechanics, Prentice Hall.

ENGINEERING GRAPHICS

Semester I/II CIE Marks' : 40

Course Code : 18EGDL15/25 SEE Marks — : 60

Teaching Hours/week (L:T:P) —: 2:0:2 Exam Hours : 03 Credits : 03

Course Learning Objectives:

This course will enable students to

CLO1 To expose the students to standards and conventions followed in preparation of engineering drawings.

CLO2 To make them understand the concepts of orthographic and isometric projections.

CLO3__ Develop the ability of conveying the engineering information through drawings.

CLO4 = To make them understand the relevance of engineering drawing to different engineering domains.

CLO5_ To develop the ability of producing engineering drawings using drawing instruments.

CLO6 To enable them to use computer aided drafting packages for the generation of drawings.

MODULE-I

Introduction to Computer Aided Sketching:

Introduction, Drawing Instruments and their uses, relevant BIS conventions and standards. Lettering, line conventions, dimensioning, material conventions, and free hand practicing.

Computer screen, layout of the software, standard tool bar / menu and description of most commonly used tool bars, and navigational tools.

Co-ordinate system and reference planes HP, VP, RPP & LPP of 2D/3D environment. Selection of drawing sheet size and scale.

Commands and creation of Lines, coordinate points, axes, poly-lines, square, rectangle, polygons, splines, circles, ellipse, text, move, copy, off-set, mirror, rotate, trim, extend, break, chamfer, fillet, curves, constraints viz., tangency, parallelism, inclination and perpendicularity.

MODULE-II

Orthographic projections of points, straight lines and planes:

Introduction, Definitions - Planes of projection, reference line and conventions employed. First angle and Third angle projection.

Projections of points in all the four quadrants. Projections of straight lines (located in first quadrant/first angle only), true and apparent lengths, true and apparent inclinations to reference planes (No application problems and midpoint problems).

Orthographic projections of plane surfaces (First angle projection only):

Projections of regular plane surfaces—triangle, square, rectangle, pentagon, hexagon and circle-in simple positions inclined to both the planes; planes in different positions by change of position method only. (No problems on punched plates and composite plates).

MODULE - III

Projections of solids: Introduction, definitions — projections of right regular tetrahedron, hexahedron (cube), prisms, pyramids, and cones with axis inclined to both the planes. (Solids resting on HP only and no problems on octahedrons, and freely suspended solids.)

MODULE IV

Development of Lateral Surfaces of Solids: Introduction to section planes and sectional views. Development of lateral surfaces of right regular prisms, cylinders, pyramids, and cones resting with base on HP only. Development of their frustums and truncations. (No problems on lateral surfaces of trays, tetrahedrons, spheres and transition pieces).

MODULE-V

Isometric Projection (using isometric scale only) Introduction, Isometric scale, Isometric projection of simple plane figures, Isometric projection of hexahedron(cube), right regular prisms, pyramids, cylinders, cones, and spheres. Isometric projection of combination of two simple solids. Conversion of given isometric/ pictorial views to orthographic views of simple objects.

Course Outcomes: Upon completion of this course, students will be able to

CO1 Prepare engineering drawings as per BIS conventions mentioned in the relevant codes.

CO2 Produce computer generated drawings using CAD software.

CO3 Use the knowledge of orthographic projections to represent engineering information / concepts and present the same in the form of drawings.

CO4 Develop isometric drawings of simple objects reading the orthographic projections of those objects.

CO5 Convert pictorial and isometric views of simple objects to orthographic views. Question paper pattern:

Module -1 is only for practice and CIE and not for examination.

Question paper for each batch of students will be sent online by VTU and has to be downloaded before the commencement of Examination of each batch. The answer sheets will have to be jointly evaluated by the Internal & External examiners.

A maximum of THREE questions will be set as per the following pattern (No mixing of questions from different Modules).

Scheme of evaluation: From Chapters Ne

Module 2 [Choice between (Lines or Planes)] 25

Module 3 45

Module 4 or Module 5 30

Total 100

Total Marks 60 40 100

Students have to submit the computer printouts and the sketches at the end of the examination. Both Internal & External examiners have to jointly evaluate the solutions (sketches) and computer display & printouts of each student for 100 marks (60 marks for solutions & sketches + 40 marks for computer display and printouts) and submit the marks list along with the solution (sketches) on graph sheets & computer printouts in separate covers.

Each batch must consist ofa maximum of 12 students. Examination can be conducted in parallel batches, ifnecessary. Textbooks:

Engineering Drawing — N.D. Bhatt & V.M. Panchal, 48th edition, 2005- Charotar Publishing House, Gujarat.

2. Engineering Graphics — K.R. Gopalakrishna, 32nd edition, 2005- Subash Publishers Bangalore.

3. Computer Aided Engineering Drawing - by Dr. M H Annaiah, Dr CN Chandrappa and Dr. B Sudheer Premkumar, Fifth edition, New Age International Publishers.

Reference Books:

1. Computer Aided Engineering Drawing — S. Trymbaka Murthy, — IK. International Publishing House Pvt. Ltd., New Delhi, 3rd revised edition-
2. Engineering Drawing-by N.S.Parthasarathy & Vela Murali, Oxford University Press, 2015

3. Fundamentals of Engineering Drawing with an Introduction to Interactive Computer Graphics for Design and Production- Luzadder Warren J., Duff John M., Eastern Economy Edition, 2005- Prentice-Hall of India Pvt. Ltd., New Delhi.

4. A Primer on Computer Aided Engineering Drawing-2006, Published by VTU, Belgaum.

5. Publications of Bureau of Indian Standards

ENGINEERING PHYSICS LABORATORY

Semester : I/II CIE Marks : 40

Course Code : I8PHYL16/26 SEE Marks: 60

Teaching Hours/week (L:T:P) —: 0:0:2 Exam Hours: 03 Credits : 01

Course Learning Objectives: This course (18PHY 16/26) will enable students ¢ To realize experimentally, the mechanical, electrical and thermal

properties of materials, concept of waves and oscillations

Design simple circuits and hence study the characteristics of

Title of the Experiment

1 | Determination of spring constants in Series and Parallel combination I

2 | Determination of Magnetic field intensity is along the axis of a circular Il coil carrying current(by deflection method)

3 | n& I by Torsional pendulum (radius of the wire, mass and dimensions of the regular bodies to be given). (In the examination either n or I to be II asked)

4 | Young's modulus of a beam by Single Cantilever experiment (breadth I and thickness of the beam to be given)

5 | Radius of curvature of piano convex lens using Newton's rings(wavelength of light to be given)

6 | Study Series and parallel LCR resonance and hence Calculate VI inductance, band width and quality factor using series LCR Resonance

7 | Determine Acceptance angle and Numerical aperture of an optical fiber

8 | Determine Wavelength of semiconductor laser using Laser diffraction IV by calculating grating constant.

9 | Estimation of Fermi Energy of Copper

10} Study of input and output Transistor characteristics and hence calculate input resistance

11 | Draw photodiode characteristics and calculate power responsivity

12 | Calculation of Dielectric constant by RC charging and Discharging

Note: 1.In addition to above experiments, Reddy shock tube must be introduced as compulsory demo experiment. 2. All12 experiments are mandatory. Student has to perform 2 experiments in the semester end examination. Course Outcomes: Upon completion of this course, students will be able to

1. Apprehend the concepts of interference of light, diffraction of light, Fermi energy and magnetic effect of current
2. Understand the principles of operations of optical fibers and semiconductor devices such as Photodiode, and NPN transistor using simple circuits
3. Determine elastic moduli and moment of inertia of given materials with the help of suggested procedures
4. Recognize the resonance concept and its practical applications
5. | Understand the importance of measurement procedure, honest recording and representing the data, reproduction of final results

Scheme of Evaluation (with effect from 2018-19 Scheme) Subject : Engineering Physics Lab Code :18PHYL16/26

The student has to perform TWO experiments during the practical examination of THREE hours duration. The scheme of valuation shall be as follows.

SL Description Part:A Part:B No. Max.Marks Marks for Marks for First experiment | Second experiment

01 | Write up: Formula, Tabular 16 4+24+2=08 44+2+2=08 column and Circuit diagram/Ray Diagram

02 | Experimental set — up/Circuit 10 05 05 connection

03 | Conduction and reading 40 20 20

04 | Graph, Calculations, Results and 20 2+442+2=10 2+4+2+2=10 accuracy

06 | Viva-Voce 14 07 07

Total 100 50 50

Note: The student is required to obtain a minimum of 40 % Marks in the practical examination to pass.

BASIC ELECTRICAL ENGINEERING LABORATORY

Semester : I/II CIE Marks' : 40

Course Code : I8ELEL17/27 SEE Marks — : 60

Teaching Hours/week (L:T:P) —: 0:0:2 Exam Hours : 03 Credits : 01

Course Objectives:

To provide exposure to common electrical components such as Resistors, capacitors and inductors, types of wires and measuring instruments.

To measure power and power factor measurement of different types of lamps and three phase circuits.

To explain measurement of impedance for R-Land R-C circuits.

To determine power consumed ina 3 phase load.

To determine earth resistance and explain methods of controlling a lamp from different places.

Orientation class for an exposure to:

Resistors, capacitors, inductors, rheostats,diodes, transistors,types of wires, measuring instruments — voltmeter, ammeter, wattmeter, multi- meter, Regulated power supply, Function generator, oscilloscope, transformer, dc motor, synchronous generator, three phase induction motor etc.

Basic safety precautions while dealing with electricity.

LIST OFEXPERIMENTS

1) PO By in Verification of KCLand KVL for DC circuits.

2) Measurement of current, power and power factor ofincandescent lamp, fluorescent lamp, and LED lamp.

3) Measurement of resistance and inductance ofa choke coil using 3 voltmeter method.

4) Determination of phase and line quantities in three phase star and delta connected loads.

5) Measurement of three phase power using two wattmeter method.

6) Two way and three way control of lamp and formation of truth table. Measurement of earth resistance.

7) Study of effect of open and short circuit in simple circuits. Demonstration Experiments (for CIE only):

8) Demonstration of fuse and MCB separately by creating a fault. Demonstration of cut-out sections of electrical machines (DC machines, Induction machines and synchronous machines).

9) Understanding ac and de supply. Use of tester and test lamp to ascertain the healthy status of mains.

10) Understanding of UPS.

Revised Bloom's Taxonomy Levels L,- Remembering, L,- Understanding, L,- Applying, L,- Analysing

Course Outcomes: At the end of the course the student will be able to:

Identify the common electrical components and measuring instruments used for conducting experiments in the electrical laboratory.

Compare power factor of lamps.

Determine impedance of an electrical circuit and power consumed in a 3 phase load.

Determine earth resistance and understand two way and three way control of lamps.

Graduate Attributes (As per NBA): Engineering Knowledge, Problem Analysis, Individual and Team work, Communication

Conduct of Practical Examination:

3.All laboratory experiments are to be included for practical examination. Breakup of marks and the instructions printed on the cover page of answer script to be strictly adhered by the examiners.

Students can pick one experiment from the questions lot prepared by the examiners.

Change of experiment is allowed only once and 15% Marks allotted to the procedure part shall be made zero.

TECHNICAL ENGLISH - I

Semester I/II CIE Marks' : 40

Course Code : I8EGHI18 SEE Marks: 60

Teaching Hours/week (L:T:P) —: 0:2:0 Exam Hours: 03 Credits : 01

Course Learning Objectives:

The course Technical English—I will enable the students ,

° To impart basic English grammar and essentials of language skills

° To train to identify the nuances of phonetics, intonation and enhance

pronunciation skills . Toenhance with English vocabulary and language proficiency Language Lab

For augment LSRW and GV skills (Listening, Speaking, Reading, Writing and Grammar, Vocabulary) through tests, activities, exercises etc., comprehensive web-based learning and assessment systems can be referred.

Module – I

Introduction to Technical Communication Fundamentals of Technical Communication Skills, Barriers to Effective Communication, Different styles in Technical Communication. Interpersonal Communication Skills, How to improve Interpersonal Communication Skills, Developing Interpersonal Skills. Grammar : Basic English Grammar and Parts of Speech - Nouns, Pronouns, Adjectives, Verbs, Adverbs, Preposition, Articles, Conjunctions.

(RBT Levels : L1, L2 & L3)

Module – II

Introduction to Listening Skills and Phonetics —I Introduction to Phonetics, Sounds Mispronounced, Silent and Non silent Letters, Homophones and Homonyms, Aspiration, Pronunciation of 'The', words ending 'age', some plural forms. Articles: Use of Articles — Indefinite and Definite Articles. (RBT Levels : L1, L2 & L3)

Module - III

Developing Listening Skills (Phonetics and Vocabulary Building) - II Speech Sounds: Vowels and Consonants - Exercises on it. Preposition, kinds of Preposition and Prepositions often Confused. Word Accent — Rules for Word Accent, Stress Shift, Question Tags, Question Tags for Assertive Sentences(Statements) — Some Exceptions in Question Tags and Exercises, One Word Substitutes and Exercises.

GD Vocabulary —Synonyms and Antonyms, Exercises on it. (RBT Levels : L1,L2 & L3)

Module - IV

Speaking Skills (Grammar and Vocabulary) —I Syllables, Structures, Strong and Weak forms of words, Words formation - Prefixes and Suffixes (Vocabulary), Contractions and Abbreviations. Spelling Rules and Words often Misspelt— Exercises on it. Word Pairs (Minimal Pairs) — Exercises, The Sequence of Tenses (Rules in use of Tenses) and Exercises on it. (RBT Levels: L1,L2 & L3)

Module - V

Speaking Skills (Grammar and Vocabulary) -— IT Extempore/Public Speaking, Difference between Extempore/Public Speaking, and Guidelines for Practice. Mother Tongue Influence(MTI) — South Indian Speakers, Various Techniques for Neutralisation of Mother Tongue Influence — Exercises, Listening Comprehension — Exercises. Information Transfer : Oral Presentation - Examples. Common Errors in Pronunciation.

(RBT Levels : L1,L2 & L3)

Course Outcomes:

On completion of the course, students will be able to,

CO 1: Use grammatical English and essentials of language skills and identify the nuances of phonetics, intonation and flawless pronunciation

CO2: Implement English vocabulary at command and language proficiency

CO3: Identify common errors in spoken and written communication

CO4: Understand and improve the non verbal communication and kinesics

CO5: Perform well in campus recruitment, engineering and all other general competitive examinations

Question paper pattern for SEE (Semester end examination) The SEE question paper will be set for 100 marks and the pattern of the question paper will be objective type (MCQ).

Textbooks

1) Communication Skills by Sanjay Kumar and Pushp Lata, Oxford University Press - 2018. Refer it's workbook for activities and exercises — "Communication Skills — I (A Workbook)" published by Oxford University Press—2018.

2) English Language Communication Skills (Lab Manual cum Workbook), Cengage learning India Pvt Limited [Latest Revised Edition]—2018. Reference Books

English for Technical Communication by N.P.Sudharshana and C.Savitha, Cambridge University Press— 2016.

Technical Communication by Gajendra Singh Chauhan and Et al, Cengage learning India Pvt Limited [Latest Revised Edition] - 2018. Practical English Usage by Michael Swan, Oxford University Press — 2016.

High School English Grammar & Composition by Wren and Martin, S Chandh & Company Ltd— 2015.

Effective Technical Communication — Second Edition by M. Ashraf Rizvi, McGraw Hill Education (India) Private Limited—2018.