AUTONOMOUS SCHEME

Scheme and Syllabi
of

(I & II Semesters)
2015-2016

B.E. Programme for
Civil and Mechanical streams

SRI JAYACHAMARAJENDRA
COLLEGE OF ENGINEERING
Mysuru -570 006

SRI JAYACHAMARAJENDRA COLLEGE OF ENGINEERING, MYSORE - 6

Scheme of Teaching and Examination for

B.E. - I semester (Civil and Mechanical stream) Revised in 2015

OUTCOME BASED CURRICULLUM

Sl. No.	Subject Code	Course title	Teaching department	Credits				Contact hours	Marks for CIE	Marks for SEE	Total Marks	Exam duration in hrs
				L	T	P	TOTAL					
1	MA110	ENGINEERING MATHEMATICS-I	MATHS	3	1	0	4	5	50	50	100	3 Hrs
2	PH110/PH210	ENGINEERING PHYSICS	PHYSICS	4	0	0	4	4	50	50	100	3 Hrs
3	CV110	ENGINEERING MECHANICS	CIVIL	4	0	0	4	4	50	50	100	3 Hrs
4	EE110	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	E&EE	4	0	0	4	4	50	50	100	3 Hrs
5	ME120/ME220	MECHANICAL ENGINEERING SCIENCE	MECH./IP	4	0	0	4	4	50	50	100	3 Hrs
6	PH12L/PH22L	ENGINEERING PHYSICS LAB	PHYSICS	0	0	1.5	1.5	3	50	-	50	-
7	ME12L	BASIC WORKSHOP PRACTICE	MECH./IP	0	0	1.5	1.5	3	50	-	50	-
8	HU120/HU220	FUNCTIONAL ENGLISH	HUMANITIES	2	0	0	2	2	50	-	50	-
							25	29			650	

SRI JAYACHAMARAJENDRA COLLEGE OF ENGINEERING, MYSORE - 6

Scheme of Teaching and Examination for

B.E. - I semester (Civil and Mechanical stream) Revised in 2015

OUTCOME BASED CURRICULLUM

Sl. No.	Subject Code	Course title	Teaching department	Credits				Contact hours	Marks for CIE	Marks for SEE	Total Marks	Exam duration in hrs
				L	T	P	TOTAL					
1	MA210	ENGINEERING MATHEMATICS-II	MATHS	3	1	0	4	5	50	50	100	3 Hrs
2	CH210/CH110	ENGINEERING CHEMISTRY	CHEMISTRY	4	0	0	4	4	50	50	100	3 Hrs
3	CV210	STRENGTH OF MATERIALS	CIVIL	4	0	0	4	4	50	50	100	3 Hrs
4	CS210/CS110	PROGRAMMING IN C	CSE/ISE	4	0	0	4	4	50	50	100	3 Hrs
5	ME210/ME110	COMPUTER AIDED ENGINEERING GRAPHICS	MECH.	2	0	2	4	4	50	50	100	3 Hrs
6	CH22L/CH12L	ENGINEERING CHEMISTRY LAB	CHEMISTRY	0	0	1.5	1.5	3	50	-	50	-
7	CS22L/CS12LC	PROGRAMMING LAB	CSE/ISE	0	0	1.5	1.5	3	50	-	50	-
8	HU210/HU110	INNOVATION	HUMANITIES	2	0	0	2	2	50	-	50	-
9	HU230/HU130	KANNADA	HUMANITIES	-	-	-	-	2	-	-	-	-
							25	31			650	

ENGINEERING MATHEMATICS - I

I Semester B.E. (Civil and Mechanical stream)

Sub. Code : MA110 Contact Hrs.: 5/Week
Credits : 3-1-0 Total Hrs.: 39+26=65

Course Objectives

1. To equip the student with the mathematical tools, from calculus and differential equations, necessary to understand topics covered in the engineering disciplines.
2. Students should be able to identify situations in their chosen branches of Engineering which they could model as simple ODEs and interpret the solution.

Course Outcomes

CO-1 Use partial derivatives to calculate rate of change of multivariate functions.

CO-2 Discuss the nature of polar curve and use these concepts to find different parameters.

CO-3 Understand the concepts of limits, sequences, series, convergence, divergence and region of convergence and apply these in engineering problems.

CO-4 Apply the concepts of functions of several variables.

CO-5 Apply differential calculus to determine the Voltage-response characteristic of an inductive circuits.

CO-6 Recognize and solve first-order ordinary differential equations, Newton's law of cooling.

CO-7 Will be able to analyze and interpret data.

Syllabus

1. Curve tracing and tracing of standard curves; Polar curves, angle between the radius vector and tangent at a point, pedal equation; mean value theorems, Polynomial approximation and Taylor's theorem; Indeterminate forms.

10 Hours

2. Partial differentiation: homogeneous functions, implicit functions, Jacobians, Taylor's theorem in two variables, error estimation; Applications of Partial differentiation, maxima and minima of functions of several variables, Lagrange multipliers.

10 Hours

3. Infinite sequences and series, convergence and divergence, standard examples.

3 Hours

4. Integral calculus: Reduction formulae; beta and gamma functions

6 Hours

5. Differential equations: Solutions of first order ODEs; orthogonal trajectories (cartesian / polar curves)..

6 Hours

6. Statistics: Treatment of data: measures of central tendency - mean, median, mode and quartiles; measures of dispersion - std. Deviation, moments, skewness, kurtosis.

4 Hours

Text Books:

1. Advanced Engineering Mathematics, Erwin Kreizyg
2. Introductory Statistics, 2nd Edition, 2006, by Ross Sheldon M.

References:

1. Advanced Calculus, David V Widder, Prentice-Hall, Second Edition.
2. Calculus, Volumes I and II, T. M. Apostol.

ENGINEERING PHYSICS

I Semester B.E. (Civil and Mechanical stream)

Sub. Code : PH110/PH210 Contact Hrs.: 4/Week
Credits : 4-0-0 Total Hrs.: 52

Course Objectives

After completing the course, the student should be able to:

1. Imbibe the basic concepts of Physics in a correct perspective.
2. Understand the blending of physics principles in recent technology through the basic point of view so that it can be exploited in development of technology.
3. Equip with right type of knowledge in Nanotechnology & Material science and their applications.
4. Analyze the relationship between nano/microstructure, characterization, properties and design of materials.
5. Adapt in advanced studies leading to research in engineering and physical sciences.

Course Outcomes

The student will be able to:

CO-1 Analyze the basic concepts of Modern Physics, principles of Quantum Mechanics and the relevance of special theory of relativity in Modern Physics and Quantum Mechanics.

CO-2 Explain the Electrical conductivity & Superconducting properties of materials and their suitability for Engineering application.

CO-3 Discuss the Principles of Laser & its application in Optical Fiber Communications.

CO-4 Identify the importance of structural studies in materials and compare/classify the different materials based on its crystal structures.

CO-5 Compare the different methods of preparation of Nanomaterials such as CNT's & its properties and applications.

Syllabus

UNIT-I

Modern Physics & Quantum Mechanics:

Introduction to blackbody radiation spectrum, Wave- Particle dualism, de-Broglie hypothesis - de Broglie wavelength - extension to electron particle, Davisson and Germer Experiment, Matter waves and their characteristic properties. Phase velocity, group velocity and Particle velocity, Relation between phase velocity and group velocity, Relation between group velocity and particle velocity, Expression for de-Broglie wavelength using group velocity.

7 Hours

Heisenberg's uncertainty principle and its physical significance, Application of uncertainty principle - Non-existence of electron in the nucleus, Wave function- Properties, Physical significance (Probability Density), and Normalization. Setting up of one dimensional time independent Schrödinger wave equation, Eigen values and Eigen functions, Application of Schrödinger wave equation - Eigen values for a particle in one dimensional potential well of infinite depth and for free particle.

7 Hours

UNIT-II

Electrical Conductivity in Metals & Superconductivity

Classical theory: Free-electron concept, Drude- Lorentz theory & Assumptions, Drift velocity & its Expression, Mean collision time, Mean free path & Relaxation time, Expression for electrical conductivity / resistivity in metals, Failures of classical free-electron theory.

Quantum theory: Assumptions, Density of states (Derivation), Fermi-energy, Fermi factor & its temperature dependence, Fermi - Dirac Statistics, Expression for electrical resistivity / conductivity, Merits of Quantum free - electron theory.

7 Hours

Temperature dependence of resistivity in superconducting materials, BCS theory (qualitative), Effect of Magnetic field (Meissner effect), Temperature dependence of Critical field, Type-I and Type-II superconductors, High temperature superconductors, Applications - Superconducting magnets, Maglev vehicles.

4 Hours

UNIT-III

Lasers & Optical Fibers

Principle and Production, Einstein's coefficients (expression for energy density), Requisites & condition of a Laser system. Principle, Construction and working of Semiconductor Laser & CO_2 Laser, Applications of Laser - Laser welding, cutting and drilling.

Propagation mechanism in optical fibers, Angle of acceptance & Numerical aperture (Propagation Condition), Types of optical fibers on basis of modes of propagation, Attenuation, Application - Point to point communication system.

8 Hours

UNIT-IV

Crystal Physics

Space lattice, Bravais lattice, Lattice parameters, Unit cell & Primitive cell, Different Crystal systems, Direction and planes in a crystal, Miller indices, Expression for inter-planar spacing, Co-ordination number, Atomic packing factor, Crystal structures of NaCl and Diamond. Bragg's Law of X-ray diffraction, Crystal structure determination by Bragg's X-ray spectrometer.

7 Hours

UNIT-V

Special Theory of Relativity & Nanotechnology

Frames of References, Basic Postulates of theory of relativity, Lorentz transformation equations (no derivation), Invariance

of Lorentz transformations, Lorentz -Fitzgerald's length contraction, Einstein's time dilation, Addition of velocities, Variation of mass with velocity, Mass energy equivalence $E = mc^2$, Relation between total energy, rest mass energy and momentum.

6 Hours

Introduction to Nano-Science and Nanotechnology, Quantum size effect, Preparation of nanomaterials by Sol-Gel and Arc-discharge methods, Atomic Force Microscope (AFM) - Principle and working, Carbon nanotubes (CNT) - Classification of carbon nanotubes, Mechanical and electronic properties of carbon nanotubes & its applications.

6 Hours

References:

1. Engineering Physics - Srinivasan M R - New Age International, New Delhi.
2. Engineering Physics - Gaur & Gupta - Dhanpathrai & Sons, New Delhi.
3. Solid State Physics - S.O. Pillai - New Age International, New Delhi.4.
5. Modern Physics - Kenneth Krane - John Wiley & sons, India Edition.
6. Engineering Physics - Avadhanulu & Kshirsagar - S,Chand & company Ltd, New Delhi.
7. Modern Physics - R. Murugeshan & Kiruthiga Sivaprasath - S,Chand & company Ltd, New Delhi.
8. Modern Physics - Arthur Beiser, Tata McGraw Hill, New Delhi.
9. Solid State Physics - Charles Kittel, John Wiley & sons, India Edition.

ENGINEERING MECHANICS

I Semester B.E. (Civil and Mechanical stream)

Sub. Code : CV110 Contact Hrs.: 4/Week
Credits : 4-0-0 Total Hrs.: 52

Course Objective

1. To analyse problems in engineering subjected to a force system to compute the net effect
2. To analyses the equilibrium of rigid bodies.
3. To determine the geometric properties of plane sections.

Course Outcomes

The student has the

CO-1 Ability to analyze the given force system to compute its resultant.

CO-2 Ability to determine the reactions at the supports of statically determinate systems .

CO-3 Ability to analyze the system of forces in equilibrium with or without frictional forces.

CO-4 Ability to locate the centroid of plane figures and to compute the second moment of areas of standard sections.

Syllabus

1. Introduction to Engineering mechanics: Basic idealizations - Particle, Continuum, Rigid body and Point force; Newton's laws of motion, Definition of Force, Introduction to SI units, Elements of a force, Classification of force and force systems; Principle of physical independence of forces, Principle of superposition of forces, Principle of transmissibility of forces; Moment of a force, couple, moment of a couple, characteristics of a couple, Equivalent force - couple system; Resolution of a force, Composition of forces; Numerical problems on moment of forces and couples and on equivalent force - couple system.
2. Composition of forces - Definition of Resultant; Composition of coplanar - concurrent force system, Principle of resolved parts; Numerical problems on composition of coplanar-concurrent force systems.
3. Composition of coplanar - non-concurrent force system, Varignon's principle of moments; Numerical problems on composition of coplanar non-concurrent force systems.
4. Centroid of plane figures and simple built up sections; Numerical problems.
5. Moment of inertia of an area, polar moment of inertia, Radius of gyration, Perpendicular axis theorem and Parallel axis theorem; Moment of inertia of composite areas; Numerical problems.
6. Equilibrium of forces - Definition of Equilibrant; Conditions of static equilibrium for different force systems, Lami's theorem; Numerical problems on equilibrium of coplanar - concurrent force system.
7. Types of supports, statically determinate beams, Numerical problems on equilibrium of coplanar - non-concurrent force system and support reactions for statically determinate beams; numerical problems.
8. Friction - Types of friction, Laws of static friction, Limiting friction, Angle of friction, angle of repose; Impending motion on horizontal and inclined planes; Numerical problems.

Text Books:

1. Mechanics for Engineers: Vol. 1 - Statics, Ferdinand P. Beer and E. Russel Johnston Jr., McGraw-Hill Book Company, New York.
2. Elements of Civil Engineering and Engineering Mechanics, Syed Shakeeb Ur Rahman and V. Madhava Rao, Sanguine Technical Publishers, Bangalore.

References:

1. Engineering Mechanics, Vol. 1 - Statics, J.L. Merium and L.G. Kraige, 3rd Edition, John Wiley and Sons, New York.
2. Engineering Mechanics, K.L. Kumar, Tata McGraw-Hill Publishing Company, New Delhi.
3. Engineering Mechanics, Arthur P. Boresi and Richard J. Schmidt; Thomson Brookes Publishers,

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

I Semester B.E. (Civil and Mechanical stream)

Sub. Code : EE110 Contact Hrs.: 4/Week
Credits : 4-0-0 Total Hrs.: 52

Course Objective

The emphasis in this course is on teaching relevant electrical and electronics engineering concepts to engineers who will be users, not designers, of electrical, electromagnetic and electronic systems. Typically these engineers would specialize in branches other than electrical and electronics. The course should help the students to:

1. Understand the function of components and equipment.
2. Acquire the skills to properly utilize the aids that modern electrical technology can offer.
3. Facilitating active cooperation with specialists in electrical engineering.
4. Providing a basis for further studies in this area.

Course Outcomes

After completing this course, the student should be able to

CO-1 Analyze a resistive network excited by D.C. or a network excited bysingle-phase or three-phase A.C. source/s and compute voltage/s, current/s, and power in them, describe how electric energy is generated, transmitted, and distributed, describe the power sector organization structure in India.

CO-2 Describe the working principle and applications of transformers, induction motors and stepper motors. Solve simple problems on them.

CO-3 Describe concealed wiring employed in domestic installations, explain the working and applications of GLS, TL, and CFL lamps, explain safety aspects to be kept in mind in respect of electrical installations.

CO-4 Explain the working and applications of the following basic components of electronic systems; diode, BJT, SCR, MOSFET, IGBT, basic logic gates, flip flops, memories, counters and registers, opamps, ADC and DAC.

CO-5 Explain the working of a regulated power supply.

Syllabus

Note: Where ever necessary, exposure to real-time systems/lab may be included.

1. Elementary Circuit and Network Theory

Kirchhoff's Laws and their applications to compute current, voltage and power in simple resistive circuits excited by D.C. voltage source/s. Sinsusoidal voltage generation. Meaning of phase difference, average and effective values of sinusoids. Phasor representation of sinusoids. Concept of impedance. Analysis with phasor diagram, of circuits with R, L, C, R-L, R-C, R-L-C for series and parallel configurations. Illustrative examples (excluding series-parallel combination). Definition of real power, reactive power, apparent power and power factor. Need for power factor improvement. Necessity and advantages of three-phase systems. Three phase EMF generation. Meaning of : phase sequence, balanced supply and load.

2. Electric Power Systems and Machinery

Mention of conventional and non-conventional energy sources. Block diagrams of thermal and hydel power plants. General structure of electrical power systems. Power transmission and distribution via overhead lines and underground cables. Power sector organization structure in India.

Synchronous Machines: principle of operation and types.

Transformers: Single-phase transformers. Rating, power losses, efficiency and regulation (derivation of equations not required). Autotransformer. Three-phase transformers. Induction motors: Introduction to three-phase motors, types, construction, principle

of operation, ratings and characteristics, starters, applications. Introduction to single-phase induction motors. Stepper motors: construction, working principle, ratings and applications.

3. Domestic Wiring, Lighting, and Electrical Safety

Mention of types of domestic wiring. Study of concealed wiring and applications. Two position and three position control of a lamp and their applications. Types of lamps. Working of GLS lamp, TL lamp, and CFL lamps. Electric shock and safety aspects. Need for earthing. Pipe earthing. Fuses. MCB's and ELCB's in domestic wiring.

4. Elements of Electronics Engineering

Introduction to diode, BJT, SCR, IGBT, MOSFET and their applications. Basic logic gates, combinatorial circuits, flip flops, memory, counters and registers. ADC and DAC. Opamps as adder, subtractor, integrator and differentiator. Regulated power supply.

Text Books:

1. E. Hughes, ``Electrical Technology", International Students 7th Edition, A.W.L. Press, 1998. Revised by I. M. Smith.
2. Bernard Grob, "Basic Electronics", McGraw-Hill, 1996.
3. Malvino, "Digital Electronics and Microprocessors", TMH.
4. Lecture Notes.

MECHANICAL ENGINEERING SCIENCE

I Semester B.E. (Civil and Mechanical stream)

Sub. Code : ME120/ ME220 Contact Hrs.: 4/Week
Credits : 4-0-0 Total Hrs.: 52

Course Objectives

1. To explain the role of Mechanical Engineering and its integration to other fields of Engineering.
2. To explain importance of different forms of energy, its classification including conventional and non conventional energy resources and their transformation.
3. To explain with neat sketches, construction and working principles of Mechanical Systems/ contrivances like Prime Movers, Refrigeration and Air Conditioning units, power transmitting systems and metal joining methods.
4. To describe with neat sketches, Manufacturing Processes like casting, Metal Cutting and use of various machine tools.
5. To know the choice of engineering materials that are available for the Engineer and identify the processes used to transform them in to products

Course Outcomes

CO-1 The student must be able to define energy sources, and explain how they could be harnessed for human benefit.

CO-2 Must be capable of identifying and selecting prime movers and other power transmission devices to be able to illustrate their importance.

CO-3 Must be capable of selecting the right material for the right application and choose the right process to convert the material into products

CO-4 Must demonstrate the ability to identify the right choice of cooling system.

Syllabus

UNIT - I
Energy and Steam

Sources and Classification of energy resources. Brief description of Solar energy, Wind energy, Tidal energy and Nuclear energy. Steam formation. Types of steam. Steam properties - Specific Volume, Enthalpy and Internal energy. (No numerical problems), Boilers, Classification, construction and working of Lancashire boiler and Babcock and Wilcox boiler. Boiler mountings and accessories

6 Hours

UNIT - II
Turbines

Steam turbines - Classification, Principle of operation of Impulse and reaction. Compounding of Impulse turbines.

Gas turbines - Classification, Working principles and Operations of Open cycle and Closed cycle gas turbines.

Water turbines -Classification, Principles and operations of Impulse and reaction

6 Hours

UNIT - III
Internal Combustion Engines

Classification, I.C. Engines parts, Two and Four Stroke Petrol and diesel engines. P-V diagrams of Otto and Diesel cycles. Simple problems on indicated power, Brake power, Indicated thermal efficiency, Brake thermal efficiency, Mechanical efficiency and specific fuel consumption.

6 Hours

UNIT - IV
Power Transmission

Belt Drives - Classification and applications. Definitions - Velocity ratio, Creep and slip, Idler pulley, stepped cone pulley

and fast & loose pulley.

Gears - Definitions, Terminology, Types and uses. Gear drives and Gear Trains simple and compound gear trains. (No numerical problems)

5 Hours

UNIT - V
Lubrication and Bearings

Lubricants - classification and properties. Lubricators - types of lubricators Wick, drop feed and splash lubricators. Classification of bearings. Pedestal bearing, Ball and roller bearings

5 Hours

UNIT - VI
Refrigeration and Air conditioning

Refrigerants, Properties of refrigerants, List of commonly used refrigerants. Refrigeration - Definitions - Refrigerating effect, Ton of Refrigeration, Ice making capacity, COP, Relative COP, Unit of Refrigeration. Principle and working of vapor compression refrigeration and vapor absorption refrigeration. Principles and applications of air conditioners.

6 Hours

UNIT - VII
Joining Processes

Soldering, Brazing and Welding Definitions. Classification and method of Soldering, Brazing and welding and differences. Brief description of arc welding and Oxy-Acetylene welding.

5 Hours

UNIT - VIII
Lathe and Drilling Machines

Lathe - Specification of Lathe, Principle of working of a centre lathe. Parts of a lathe. Operations on lathe - Turning, Facing,

Knurling, Thread Cutting, Drilling, Taper turning by Tailstock offset method and Compound rest swiveling method.
Drilling Machine - Principle of working and classification of drilling machines. bench drilling Machine, Radial drilling machine. Operations on drilling machine -Drilling, Boring, Reaming, Tapping, Counter sinking, Counter boring and Spot facing. Specification of radial drilling machine

7 Hours

UNIT IX

Materials for manufacturing

Classification of different types of materials suitable for manufacturing, ferrous & non-ferrous metals and their alloys. Non-metallic materials like plastics, elastomers, ceramics and composites, material selection
Manufacturing processes: Pattern and pattern materials. Types of patterns and moulding sands. Moulding processes - Green sand mould and Shell moulding preparation. Die casting - Hot and cold chamber die casting

6 Hours

Text Books:

1. Elements of Mechanical Engineering - Kestoor Praveen , Ramesh M R :Interline Publishing House

References:

1. Elements of Mechanical engg., - Hajra chowdhyry & others, Media promoters 2010
2. Elements of Mechanical Engineering Sciences - Dr. K.V.A. Balaji & K. Rama Sastry, Sanguine Publicaitons 2006.
3. The Elements of Workshop Technology - Vol I & II , SKH Chowdhary, AKH Chowdhary , Nirjhar Roy, 11th edition 2001, Media Promotors and Publishers, Mumbai.
4. A Text Book of Elements of Mechanical Engineering - K.R. Gopalkrishna, Subhash Publishers, Bangalore.

ENGINEERING PHYSICS LAB

I Semester B.E. (Civil and Mechanical stream)

Sub. Code : PH12L/PH22L Contact Hrs.: 3/Week
Credits : 0-0-1.5 Total Hours : 39

Course Objective

After completing the course, the student should be able to:

1. Understand the significance of Physical constants & calculate the physical constants and errors involved in the measurements.
2. Use the measuring instruments like screw gauge, slide calipers, travelling microscope and spectrometer.
3. Identify the electrical/electronic components / devices & build AC/DC circuits & know their uses as voltage regulators & charge storing devices.
4. Analyze the physics principles behind the electrical properties and elastic properties of solid materials.
5. Understand the concept of optical phenomenon such as diffraction & interference.

Course Outcomes

The student will be able to:

CO-1 Determine the Elastic modulus of the solid material.
CO-2 Study the I-V characteristics of diode, Calculation of Planck's constant using LED, Calculate the energy gap of semiconductor diode.
CO-3 Understand the principles of diffraction and interference by diffraction grating and Newton's rings experiments.
CO-4 Study the Dielectric constant of material, and Fermi energy of metals.
CO-5 Study the resonance in LCR circuits and its applications as acceptor and rejector circuits.

List of Experiments

1. Series and Parallel LCR AC Circuits- Determination of

resonant frequency and Inductance.

2. Study of I-V Characteristics of a Zener Diode- Determination of knee & Zener voltages.
3. Band Gap of a Semiconductor- Determination of Energy gap of diode via I-V study.
4. Ultrasonic Interferometer- Calculation of velocity of sound in liquids.
5. Charging & Discharging of Capacitor- Determination of dielectric Constant of dielectric medium in capacitor.
6. Diffraction Grating- Determination of wavelength of Laser/ Hg source using diffraction grating.
7. Planck's Constant- Calculation of Planck's constant using I-V characteristic study of LED.
8. Stefan's Law- Verification of Stefan's law of black body experimentally.
9. Fermi Energy- Experimental determination of Fermi Energy of metal.
10. Uniform Bending- Determination of Young's modulus of elastic bodies (Hooke's Law).
11. Torsional Pendulum- Determination of Rigidity modulus of materials and moment of inertia of irregular bodies.
12. Helmholtz Resonator- Calculation of unknown frequency of tunning fork.
13. Newton's Rings- Calculation of wavelength of light source and radius of curvature of plano convex lens through interference study.
14. B-H curve- Study of hysteresis loop, retentivity and coercivity of magnetic materials.
15. Four probe experiment- Calculation of resistivity of semiconductor materials by four probe method.

BASIC WORKSHOP PRACTICE

I Semester B.E. (Civil and Mechanical stream)

Sub. Code : ME12L Contact Hrs.: 3/Week
Credits : 0-0-1.5 Total Hrs.: 39

Course Objective

1. To know the need for gaining knowledge in fitting and metal joining practices.
2. To understand these practices' are required for improving the basic attributes of an engineer like set of skills, point of view and body of knowledge.
3. To formulate and prepare the drawing for fitting and metal joining processes.
4. Outline the procedure for the preparation of jobs in fitting and metal joining practices including safety precautions to be adopted.
5. To implement various equipments and appropriate instruments in preparation of the jobs according to drawings prepared.

Course Outcomes

CO-1 Students will be able to posses the basic attributes of engineers such as psychomotor skills including perception, guided response, adaptation and origination.

CO-2 Student will be able to appreciate basic safety precautions and appropriate use of instruments for particular applications adopted in a generalized industrial situation.

Syllabus

1. Fitting Practice-Cutting, Filing, Fitting & Finishing Safety Precautions-Two Models to be Prepared Involving Rectangular, Triangular and Semi Circular Fits.
2. Metal Joining Practice-Arc Welding, Gas Welding and Soldering Practice.

Text Books:

1. The Elements of Workshop Technology, Vol.1 & 2 S K H Choudhury, A K H Choudhury and Nirjhar Roy Media Promoters and Publisheres Mumbai.
2. Workshop Manual, Department of Mechanical Engineering, SJCE, Mysore.

FUNCTIONAL ENGLISH

I Semester B.E. (Civil and Mechanical stream)

Sub. Code : HU120/HU220 Contact Hrs.: 2/Week
Credits : 2-0-0 Total Hrs.: 25

Course Outcomes

CO-1 To develop communicative skills in reading , writing, speaking and listening in English.

CO-2 To enable learners to get competency in various linguistic functions.

CO-3 To develop skills of interaction in personal and business English.

CO-4 To learn correct grammar usage to enable effective communication.

Syllabus

Class room teaching

1. Introduction: Importance of Languages
2. Grammar:
   a) Parts of Speech, Usage of Preposition and Article, Punctuation.
   b) Tenses & Degrees of Comparison.
   c) Transformation of Sentences: Active-Passive.
   d) Affirmative-Negative, Exclamatory-Assertive.
   e) Interrogative-Assertive, Kinds of sentences.
   f) Direct-Indirect Speech.
3. Vocabulary Usage: Homonyms, Correcting Spelling, One-word equivalents.
4. Precise Writing.
5. Essay/Report Writing.
6. Letter Writing: Personal, Official, Applications.
7. Idioms & Phrases: Meaning & Usage in sentences.
8. Comprehension of an unseen passage.
9. Elaboration: Expansion of ideas, proverbs.

10. Presentation: Preparation of materials and presentation - step.

Lab activities

1. Communication skills such as group discussion, interview skills, asking questions, conveying information, telephone etiquette, presentation skills, debate/ written skills such as e-mail writing, report writing, resume writing, application for job, letter writing/Soft skills such as time management, decision making, conflict management/ Life skills such as inter-personal relationship, leadership skills, assertive skills.
2. Vocabulary/Functional Grammar/pronunciation/intonation.
3. Interactive methodology/self-paced learning/self-assessment/ability to get feedback.
4. Progressive levels of learning to upgrade from beginner to middle to advanced levels.

Text Books:

1. Basic Grammar, SLN Sharma & K Shankaranarayana, Navakarnataka Publications.
2. New International Business English, Jones, Cambridge University Press.

References:

1. English Rank Scorer, G. Sankaran, Addone Publishing group, Thiruvanantapuram, Kerala
2. English Grammar, Wren & Martin
3. Oxford Guide to Speaking and Writing, John Seely, 2000.

ENGINEERING MATHEMATICS-II

II Semester B.E. (Civil and Mechanical stream)

Sub. Code : MA210 Contact Hrs.: 5/Week
Credits : 3-1-0 Total Hrs.: 39+26=65

Course Objectives

To equip the student with the mathematical tools, from calculus of several variables, necessary to understand topics covered in the engineering disciplines

Course Outcomes

Student should be able to:

CO-1 Solve differential equations of electrical circuits, forced oscillation of mass spring and elementary heat transfer.

CO-2 Solve partial differential equations in fluid mechanics, electromagnetic theory and heat transfer.

CO-3 Analyze position, velocity, and acceleration in two or three dimensions using the calculus of vector valued functions.

CO-4 Use curl and divergence of a vector valued functions in various applications of electricity, magnetism and fluid flows.

CO-5 Evaluate double and triple integrals to find area, volume, mass and moment of inertia of plane and solid region.

CO-6 To interpret large data, analyse and arrive at intelligent conclusions.

Syllabus

1. Linear ODEs of higher degree ; methods of solving - method of undetermined coefficients, variation of parameters; systems of ODEs; Legendre and Cauchy's equations. Formation of PDEs; solutions of non-homogeneous and homogeneous PDEs; method of separation of variables;

9 Hours

2. Vector differentiation, directional derivatives, gradient, divergence, curl; irrotational and solenoindal vector fields.

5 Hours

3. Line integrals: Paths and line integrals; basic properties; concept of work as line integrals; aplications.

6 Hours

4. Multiple integrals: Double and triple integrals; evaluation by change of order and change of variables; application to areas and volumes; Green's theorem.

6 Hours

5. Surface integrals, Green's, Stokes and Gauss theorems, curvillinear coordinates.

8 Hours

6. curve fitting - method of least squares; correlation and regression, coefficient of correlation, standard error of estimate; ANOVA.

6 Hours

Text Books:

1. Advanced Engineering Mathematics, Erwin Kreizyg
2. Introductory Statistics, 2nd Edition, 2006, by Ross Sheldon M.

References:

1. Calculus, Volume I & II, T. M. Apostol
2. Differential Equations with Applications and Historical Notes, G. F. Simmons, Tata-McGraw Hill.

ENGINEERING CHEMISTRY

II Semester B.E. (Civil and Mechanical stream)

Sub. Code : CH210/ CH110 Contact Hrs.: 4/Week
Credits : 4-0-0 Total Hrs.: 52

Course Objectives

To impart the knowledge of applied aspects of chemistry and utilizing the same for the technological advancement in various discipline of engineering.

Course Outcomes

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

CO-1. Understand concepts of electrochemistry and the electrochemical phenomenon involved in the energy storage and energy conversion devices.

CO-2. Able to know the mechanism of corrosion and its control and application of electrochemical concepts for surface modification techniques .

CO-3. Importance of petroleum products as conventional sources of energy and instrumental methods involved in chemical analysis.

CO-4. Know the importance of analysis of water and waste water and the technological applications of nanomaterials.

CO-5. Understand the importance of polymers and polymer composites as an engineering material, their synthesis and application in automobile, electronic and aerospace applications.

UNIT -I

ELECTROCHEMISTRY

Introduction, Single electrode potential - definition, origin, sign

conventions, standard electrode potential. Derivation of Nernst equation for single electrode potential. Electrochemical cells-classification-electrolytic cells and galvanic cells. Construction of galvanic cell. EMF of a cell- definition, notation and conventions. Measurement of single electrode potential (Poggendorfc's method). Electrodes - Types-Reference electrodes - calomel electrode & Ag/AgCl electrode. Concentration cells - definition, construction and working. Ion selective electrode - glass electrode, determination of pH using glass electrode.

BATTERY TECHNOLOGY

Introduction, definition , battery characteristics, classification - primary, secondary and reserve with examples. Modern batteries-construction, working and applications of Nickel-Metal hydride, Nickel-Cadmium, Lithium-MnO_2 and Li-ion batteries.

FUEL CELLS

Introduction, classification, construction and working of H_2-O_2 and methanol-oxygen fuel cells

12 Hours

UNIT-II

CORROSION SCIENCE

Corrosion- definition, types-chemical and electrochemical corrosion. Electrochemical theory of corrosion, factors affecting the rate of corrosion-nature of metal, nature of corrosion product, relative areas of anode and cathode, temperature and pH. Types of corrosion - differential metal corrosion, differential aeration corrosion (pitting and waterline corrosion), stress corrosion-caustic embrittlement in boilers.

Corrosion control - Inorganic coatings-anodizing and phosphating, Metal coating- galvanizing and tinning. Corrosion

inhibitors-cathodic and anodic. Cathodic protection- sacrificial anode and impressed current techniques, anodic protection.

ELECTROPLATING AND ELECTROLESS PLATING

Importance, significance of polarisation, decomposition potential and over-voltage in electroplating processes. Electroplating process: effect of variables on the nature of electro deposit - current density, metal salt and electrolyte concentration, metal ion concentration, temperature, pH of the bath, additives; brightners, levelers, structure modifiers and wetting agents, throwing power of the bath. Surface preparation - using solvents, alkali, acid and electropolishing, Electroplating of Cr and Ni.

Electroless plating - differences between electroplating and electroless plating, advantages of electroless plating, electroless plating of copper on PCB.

12 Hours

UNIT -III

ENERGY SOURCES

Chemical fuels- definition & classification; Calorific value-definition, Gross and Net calorific values (SI units). Determination of calorific value of a solid/liquid fuel using Bomb calorimeter, numerical problems. Petroleum cracking-fluidized catalytic cracking. Reformation of petrol. Knocking and its mechanism. Octane number and Cetane number. Prevention of knocking, anti-knocking agents, unleaded petrol.

INSTRUMENTAL METHODS OF ANALYSIS

Introduction, advantages over conventional methods. Principle, theory and applications of Colorimetry, Potentiometry and Conductometry.

9 Hours

UNIT-IV

WATER CHEMISTRY

Introduction, hardness - types, units of hardness. Determination of hardness of water by EDTA method. Water analysis - estimation of chloride, fluoride and nitrate. Determination of DO by winkler's method. Bio-chemical Oxygen Demand and Chemical Oxygen Demand. Numerical problems on BOD and COD. Desalination of water - electro dialysis and reverse osmosis.

CHEMISTRY OF NANOMATERIALS

Introduction, definition, classification of nanomaterials-0D spheres and clusters, 1D nano fibres, wires and rods (multilayers), 2D films, plates and networks, (Ultrafine-grained overlayers), 3D nanomaterials. General properties of nanomaterials, synthesis of nanomaterials - top down and bottom up approach-methods, Sol-gel method and chemical vapour deposition method.Applications of nanomaterials and nanotechnology.

10 Hours

UNIT-V

HIGH POLYMERS

Polymers-classification (natural and synthetic) with examples. Polymerisation; types-addition and condensation with examples. Free radical mechanism of addition polymerization. Methods of polymerization - bulk, solution, suspension and emulsion. Thermoplastics and thermosetting plastics with examples, weight average and number average molecular weight. Glass transition temperature (Tg) - parameters affecting Tg and significance of Tg. Synthesis, properties and applications of PTFE, PMMA and PU

Elastomers - definition, deficiencies of natural rubber,

advantages of synthetic rubber, Vulcanisation of rubber. Synthesis and applications of neoprene and butyl rubber.

Adhesives- definition, synthesis, properties and applications of epoxy resin.

Conducting polymers - definition and mechanism of conduction in polyacetylene.

9 Hours

References:

1. A text book of Engineering Chemistry by Jain and Jain, Dhanapatrai Publications, New Delhi.
2. Engineering Chemistry by Uppal, Khanna Publishers, Sixth Edition, 2001.
3. Principles of Physical Chemistry by B.R. Puri, L.R.Sharma & M.S. Pathania, S.Nagin Chand and Co., 33rd Ed., 1992.
4. A text book of Physical Chemistry by P.L.Soni and O.P.Dharma.
5. A text book of Polymer science by V.R. Gowarikar & others New-age publications.
6. Corrosion Engineering-by M. G. Fontana, Mc Graw Hill Publications.
7. Text book of Polymer science by F.W.Billmeyer, John, Wiley and Sons, 1994.
8. Environmental chemistry by Stanley E. Manahan, 7th edition, Lewis publishers, 2000.
9. Hand book of Nanotechnology, Bharath Bhushan, Spinger-Verlag Berlin Heidelberg New York.2014.

STRENGTH OF MATERIALS

II Semester B.E. (Civil and Mechanical stream)

Sub. Code : CV210 Contact Hrs.: 4/Week
Credits : 4-0-0 Total Hrs.: 52

Course Objective

1. To introduce the concept of stress and strain.
2. To calculate the stresses and strains due to axial & shear loading and due to temperature variations.
3. To analyse the two dimensional compound stress system.
4. To study the variation of bending movment and shear force along the length of the loaded beam due to different types of loads and to study the resulting stresses.
5. To analyse the circular shafts subjected to torsional moment.
6. To analyse the long columns for their critical loads.

Course Outcomes

The student has the

CO-1 ability to calculate the stresses and strains due to axial & shear forces and also due to temperature variations .

CO-2 ability to analyse a two dimensional compound stress system.

CO-3 ability to draw bending moment and shear force diagrams for beams subjected to transverse loads and also to determine the bending and shearing stresses in beams.

CO-4 ability to determine the shear stress developed in shafts due to torsion and to design a shaft for the given conditions.

CO-5 ability to determine the critical and safe loads on long columns and also to determine the section of the long columns for the given conditions.

Syllabus

1. **SIMPLE STRESSES AND STRAINS:** Concept of Stress and Strain; St. Venant's Principle; Hooke's Law; Stress-Strain Diagram for ferrous and non-ferrous materials, True stress and strain; Elastic Constants - Young's modulus, Rigidity modulus, Bulk modulus and Poisson's ratio; Relationships among elastic constants; Deformation of uniform bars; Bars of varying cross section; Deformation due to self weight; Volumetric strain; Generalized Hooke's law; Composite sections; Temperature stresses; Statically indeterminate problems.
2. **BENDING MOMENT AND SHEAR FORCE IN BEAMS:** Definitions - Bending moment and Shear force, Relationship among Bending Moment, Shear Force and Load Intensity; Bending moment and Shear force diagrams for statistically determinate beams subjected to point force, UDL, UVL and couple.
3. **STRESSES IN HOMOGENEOUS, PRISMATIC, STATICALLY DETERMINATE BEAMS:** Simple Bending Theory; Moment of resistance; Section modulus of different cross sectional shapes; Variation of bending stresses across the cross section of a loaded beam; Shear stresses in beams and their distribution over the beam cross section; Beams of uniform strength.
4. **TORSION OF SHAFTS:** Torsion equation for circular shafts; Strength and Stiffness of solid and Hallow circular shafts (Uniform cross sections); Transmission of power.
5. **COMPOUND STRESSES:** Analysis of generalized two dimensional stress system - Normal and shear stresses on any inclined plane; Principal stresses and Principal planes; Maximum shear stresses and maximum shear planes; Pure shear stresses and pure shear planes; Mohr's circle of stresses.
6. **THIN AND THICK CYLINDERS:** Stresses in thin cylinders subjected to internal and external pressures; Hoop,

Longitudinal and Volumetric strains in think cylinders; Lame's equations for stresses in thick cylinders.

7. **THEORY OF LONG COLUMNS:** Euler's formula for different end conditions; Effective length of column; Slenderness ratio; Rankine - Gordon Formula; Eccentrically loaded columns - Secant formula.

Text Books:

1. Mechanics of Materials, Ferdinand P. Beer and E. Russel Johnston (Jr.), Sl. Version Edn., McGraw-Hill Book Co., New York.
2. Strength of Materials, B.S. Basavarajaiah and P. Mahadevappa, III Edition, 2010, Universities Press (India) Pvt. Ltd., Hyderabad.

References:

1. Strength of Materials, R. Subramanian, Oxford University Press, New Delhi, 2007.
2. Mechanics of Materials, E.P. Popov, Sl. Version, II Edition, Prentice Hall of India Pvt. Ltd., New Delhi.

PROGRAMMING IN C

II Semester B.E. (Civil and Mechanical stream)

Sub. Code : CS210/CS110 Contact Hrs.: 4/Week
Credits : 4-0-0 Total Hrs.: 52

Course Outcomes

After completing this course, students should be able to:

CO-1 Understand the basic principles of Programming in C.
CO-2 Understand the usage of Control structures in C language.
CO-3 Design and develop modular programming skills.
CO-4 Understand the concepts of Structures and pointers.
CO-5 Understands the concept of memory allocation and file handling.

Syllabus

INTRODUCTION

Introduction to computer concepts, Algorithmic approach to problem solving, Basic concepts of a C program, Data types, Declaration, assignment, Input & Output statement, Types of operators and expressions, Introduction to Preprocessors, Complier control Directives, Programming examples and exercises.

10 Hours

CONTROL STATEMENTS

Branching: Different types of if statements, switch statement, ternary operator, use of goto statement.

Loops: for loop, do-while loop and while loop in C, nesting of loops, break, continue and exit statements. Programming examples and exercises.

10 Hours

ARRAYS, STRINGS AND FUNCTIONS

Arrays: Declaring, Initializing and using 1-D and 2-D arrays. Programming examples and exercises.

Strings: Declaring, Initializing, Printing and reading strings,

strings manipulation functions, strings input and output functions, arrays of strings, Programming examples and Exercises using and without using built-in functions.

Functions: Functions in C, Argument Passing, Functions and program structure, location of functions, Different types of Functions, Recursion, programming examples and exercises.

12 Hours

STRUCTURES AND POINTERS

Structures: Basic of structures, structures and Functions, Arrays of structures, structure Data types, type definition, Unions. Programming examples and exercises.

Pointers: Pointers and address, pointers and functions arguments, pointers and arrays, address arithmetic, character pointer and functions, pointers to pointer. Programming examples and exercises.

10 Hours

DYNAMIC MEMORY ALLOCATION AND FILE MANAGEMENT

Dynamic Memory Allocation: Introduction, Dynamic memory allocation functions: malloc(), calloc(), free(), realloc(). Programming examples and exercises.

Files: Introduction, Defining, opening and closing of files, Input and output operations, programming examples and exercises.

10 Hours

Text Books:

1. Brain W. Kernighan and Dennis M. Richie: The C programming Language, 2ndEdition, PHI, 2012.
2. E. Balaguruswamy : Programming with ANSI C, 5th Edition, Tata McGraw Hill Publications

References:

1. Vikas Gupta: Computer Concepts and C Programming, Dreamtech Press 2013.
2. Jacqueline Jones & Keith Harrow: Problem Solving with C, 1st Edition, Pearson 2011.

COMPUTER AIDED ENGINEERING GRAPHICS

II Semester B.E. (Civil and Mechanical stream)

Sub. Code : ME210/ ME110 Contact Hrs.: 6/Week
Credits : 2-0-2 Total Hrs.: 26+52=78

Course Objectives:

1. To identify the importance of Engineering Graphics and know its relevance in Engineering Applications.
2. To explain Orthographic Projection and to describe recognize its importance.
3. To explain the process of projection on HP, VP and PP.
4. To identify when a surface is seen in its true and apparent shape on HP, VP and PP and to locate the same in a drawing.
5. To identify and reason, in a drawing, which surfaces, edges appear in their true shapes and which surfaces don't appear in their true shapes.
6. To explain the importance pictorial representation of objects.

Course Outcomes

CO-1 The student must be able to prepare the three views of a geometrical object like points, line, planes, and solids in their given position with reference to the planes of projection.

CO-1 Must be able to read a drawing and understand the information contained in it.

CO-1 Must be able to translate a given orthographic projection into an Isometric projection and vice versa.

CO-1 Should illustrate the capability to prepare orthographic views of simple machine components.

Syllabus

1. **Introduction:** Drawing Instruments and their uses, BIS conventions, Lettering, dimensioning computer screen, layout of the software, standard tool bar/menus and description of most commonly used tool bars, navigational

tools. Co-ordinate system and reference planes. Definitions of HP, VP, RPP & LPP. Creation of 2D / 3D environment. Selection of drawing size and scale. Commands and creation of Lines, Co-ordinate 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. Dimensioning, line conventions, material conventions and lettering.

6 Hours

2. **Orthographic Projections:** Introduction-quadrants, planes of projection, reference line. Projection of points located in all the four quadrants. Front view, top view and side view. Typical problems on points and reading them

6 Hours

3. **Projections of straight Lines:** (Located in first quadrant only) Introduction-true length, apparent length true inclination and apparent inclination. Line inclined to both HP and VP.

09 Hours

4. **Projections of plane surfaces Introduction:** projection of plane surfaces - triangle, square, rectangle, rhombus, pentagon, hexagon and circle. Planes in different positions by change of position method only.

12 Hours

5. **Projections of Solids:** Introduction: projection of right regular triangular, square, rectangular pentagonal, hexagonal prisms and pyramids, cylinders, cones Tetrahedron and hexahedron (cube) in different positions when solid rests on HP and axis inclined to both HP and VP

18 Hours

6. **Development of surfaces :** Development of lateral surfaces of right regular prisms, pyramids, cylinder and cones, resting with its base completely on HP and their frustums and truncations. Tetrahedron and hexahedron (Cube) when it rests on one of its face on HP.

12 Hours

7. **Isometric Projections:** Introduction: Isometric projection, Isometric view or drawing and Isometric Scale. Isometric projection of simple plane figures, solids & combination of solids

12 Hours

Text Books:

Engineering Drawing, N D Bhatt & V M Panchal, 48th edition, 2005

References:

1. Engineering Graphics, K R Gopalakrishna, 32nd Edition, 2005, Subash Publishers Bangalore.
2. 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.

ENGINEERING CHEMISTRY LABORATORY

II Semester B.E. (Civil and Mechanical stream)

Sub. Code : CH12L/ CH22L Contact Hrs.: 3/Week
Credits : 0-0-1.5 Total Hrs.: 39

Course Objectives

To impart practical knowledge in the field of chemical analysis with respect to conventional and instrumental methods of chemical analysis.

Course Outcomes

CO-1 Understanding the techniques involved and advantages of instrumental methods over the conventional methods

CO-2 Assessment of water quality parameters like hardness & alkalinity and judging the suitability of water for domestic and industrial applications.

CO-3 Assessment of waste water quality parameters like BOD and COD in determining the extent of pollution.

CO-4 Understanding the importance of alloys as an engineering material and to analyzing them by instrumental techniques.

CO-5 Assessment of quality of haematite used for metallurgical operation.

CO-6 Applications of analytical techniques like potentiometry, colorimetry and conductometry for accurate chemical analysis.

Syllabus

PART - A

1. Determination of total hardness of water by EDTA Method.
2. Determination of total alkalinity of water sample and identification of the type and extent of alkalinity.

3. Determination of percentage of Copper in brass in the given sample of brass by iodometric method.
4. Determination of Iron in haematite solution using standard solution of potassium dichromate by external indicator method.
5. Determination of Dissolved Oxygen of the given water sample by Winkler's method
6. Determination of Chemical Oxygen Demand of an industrial effluent.

PART - B

1. Determination of p^{Ka} of weak acid using pH meter.
2. Estimation of iron in stainless steel/ FAS potentiometrically using standard solution of potassium dichromate.
3. Conductometric estimation of HCl and CH_3COOH present in a mixture using standard solution of sodium hydroxide.
4. Determination of copper colorimetricaly using ammonia as the complexing agent.
5. Determination of iron (III) by colorimetric method using potassium thiocyanate as the complexing agent.
6. Determination of equivalent conductance of strong electrolyte at infinite dilution.
7. Flame photometric method of determining sodium in water sample.

References:

1. Vogels text book of quantitative inorganic analysis, revised by J.Bassett, R.C. Denny, G.H.Jeffery,. 4th Ed.
2. Applied chemistry theory and practice by O. P. Vermani and A. K. Narula, second edition.
3. Water and waste water analysis by American -method (APHS).

C PROGRAMMING LABORATORY

II Semester B.E. . (Civil and Mechanical stream)

Sub. Code : CS22L/CS12L Contact Hrs.: 3/Week
Credits : 0-0-1.5 Total Hrs.: 50

Course Outcomes

After completing this course, students should be able to:

CO1 Analize of the behaviour of simple programs involving the basic constructs.

CO2 Execute programs using sequential, conditional and iterative control structures.

CO3 Design, implement, test and debug programs that uses single and two dimensional arrays.

CO4 Program with String handling functions.

CO5 Design programs using the concept of structure, pointers and file handling.

Syllabus

LAB EXPERIMENTS

NOTE: Tutor will Design the lab cycle to cover the following concepts.

1. Understanding programming environment, operating system and source editors.
2. Programs which includes sequential execution involving different C operators.
3. Programs that use control structures including switch-case.
4. Iterative constructs. (do, while, for)
5. Applications of single dimensional array and two dimensional array.
6. String handling and use of unformatted I/O functions.
7. User defined functions, recursive function
8. Introduce the concept of structures, pointers and file handling.

LIST OF EXPERIMENTS

LAB CYCLE - I

1. Accept two numbers and perform basic arithmetic operation. (+, - *, /, %)
2. Programs to perform mathematical operations using built-in functions. (sqrt, abs, fabs, pow)
3. Program to find area/volume of geometrical shapes (Circle, square, rectangle, triangle-given three sides, given base and height)
4. Program to convert temperature to Fahrenheit and vice versa.
5. Program to compute simple and compound interest.
6. Given the values of the variables x, y and z, write a program to rotate their values such that x has the value of y, y has the value of z, and z has the value of x.
7. Write a program that reads floating-pointing number and then displays the right-most digit of the integral part of the number.
8. Write a program that reads floating-pointing number, separate and displays the integral and decimal part of the given.

LAB CYCLE- II

1. Program to perform the following using ternary operator
   (a) check if given number is positive or negative
   (b) find the largest of two/three numbers
2. Program to check if given number is even or odd using bitwise & operator
3. Program to perform the following using bitwise operators:
   c = a & b ; d = a | b ; e = ~a
   f = a>>n; g = a<<n; h = a^b
4. Program to find the remainder of a/b without using % operator
5. Program to illustrate the use of postfix/prefix increment/ decrement operators.
6. Write a program to print the size of various data types in C.

LAB CYCLE - III

If statements

1. Write a program to determine whether a given number is Positive / Negative / Zero
2. Write a program to find the largest of two/three numbers
3. Write a program to determine whether a given number is 'odd' or 'even' and print the message NUMBER IS EVEN or NUMBER IS ODD with and without using else option.
4. Design, develop and execute a program to find and output all the roots of a given quadratic equation, for non-zero coefficients.
5. Declare the class based on 6 subject marks of a student.
6. Generate electricity bill depending on the Units consumed and varying rates for Units consumed.
7. Write a program to determine whether a given year is leap year or not.

Switch-Case

8. Write a program to input month number and display its respective month in words.
9. Write a program to simulate Simple calculator.

LAB CYCLE - IV

Loop Statement

1. Write a program to sum odd and even numbers up to 'n'
2. Write a program to generate and print first 'n' Fibonacci numbers
3. Write a program to find the sum of digits of a number reducing into single digit
4. Write a program to implement Euclid's algorithm to find the GCD and LCM of two integers and to output the results along with the given integers.
5. Write a program to reverse a given four digit integer number and check whether it is a palindrome or not. Output the given number with suitable message.
6. Write a program to display all the number between 1 and N which are divisible by 8.

7. Write a program to determine whether a given number is prime or not.
8. Write a program to generate and print all the prime numbers between given range
9. Write a C program to find the value of sin(x) using the series x - x3/3! + x5/5! - x7/7! + x9/9! - .. up to N terms accuracy (without using user defined function).
   Also print sin (x) using library functions.
10. Write a C program to find the value of cos(x) using the series 1 - x2/2! + x4/4! - x6/6! + x8/8! - ...
    Up to N terms accuracy (without using user defined function).
    Also print cos(x) using library function.

LAB CYCLE - V

One-dimensional array

1. Write a C program to input N numbers and perform linear search for a given key number.
2. Design, develop and execute a program in C to input N integer numbers into a single dimension array, sort them in to ascending order using bubble sort technique, and then to print both the given array and the sorted array with suitable headings.
3. Design, develop and execute a program in C to input N integer numbers in ascending order into a single dimension array, and then to perform a binary search for a given key integer number and report success or failure in the form of a suitable message.
4. Write a C program to input N real Numbers and to find mean, variance and standard deviation using appropriate formula.

Two-dimensional array and user-defined functions

1. Write a C program to read two matrices A (M x N) and B(M x N) and perform addition OR subtraction of A and B. Output the given matrices, their sum OR differences..

2. Write a C program to read a matrix A (M x N), find the transpose of the given matrix and output both the input matrix and the transposed matrix.
3. Write a C program to read a matrix A (M x M), find the trace and norm of the matrix and output the input matrix, trace and norm.
4. Write a recursive function to compute the factorial of a Number.

LAB CYCLE - VI

1. Write a program to check whether the given string is palindrome or not without using built-in function. Use unformatted I/O functions.
2. Write a C program to demonstrate the concepts of Pointers.
3. Write file handling programs to illustrate the following concepts:
   a. Read a line of text and store it in a file.
   b. Read the contents of a file and display the same on the monitor.
   c. Copy the content of one file to another.
   d. Write a C program to generate 1000 random integer numbers using built-in function and store then in a file.
4. Write a C program to demonstrate the usage of Structures.

Text Books:

1. Brian W. Kernighan and Dennis M. Ritche , "The C Programming Language", Prentice-Hall
2. Behrouz A. Forouzan, Richard F. Gilberg: Computer Science - A Structured Approach Using C, 3rd Edition, Cengage Learning, 2007.
3. Vikas Gupta: Computer Concepts and C Programming, Dreamtech Press/Wiley India, 2009

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References:

1. E. Balagurusamy: Programming in ANSI C, 4th Edition, Tata McGraw Hill, 2008.

INNOVATION

II Semester B.E. (Civil and Mechanical stream

Sub. Code : HU210/HU110 Contact Hrs.: 2/Week
Credits : 2-0-0 Total Hrs.: 25

Course Objective

This is a core subject and this has been prescribed in the first/ second semester with the intention of providing the importance of innovations which have global presence. Students after having completed their pre-university in science streams are able to demonstrate their core competency subjects like mathematics and science. Further, their ideation process with better creative concepts combined with ideation techniques could be useful to modulate the innovations needs of their branch of engineering.

Course Outcomes

CO-1 Identify the need for innovation and its global presence and its development in various branches of engineering.

CO-2 Comprehensively classify innovation, recognize and understand the importance of various types of innovation.

CO-3 Evaluate the scope for innovations and appreciate the methods of protection to innovations.

CO-4 Analyze innovations the past and present and study the possibility of development of few of the innovations in their branches of engineering .

CO-5 Utilize available resources and aim at the development of a project and attempt to document, publish and participate in events which could showcase their contributions to make concept a reality.

Syllabus

CHAPTER - 1

INTRODUCTION - Innovation, Inventions And Discovery, Invention - Necessity Examples, Inventions Of the Past And

Present, Innovation - Definition, Need For Innovation, Comparison Of Innovations And Inventions, Ideas - Types Of Ideas, Examples, Innovation of Products & Services - Based on Modifications and Adaptations With Examples Of Product Innovation, Service Innovation, Innovations Of Modern Era Listing Of Products/Services, Role Of Creativity And Intelligence In Innovation, Classification Of Innovation - Based On Category - Product Innovation, Process Innovation, Service Innovation, Marketing Innovation, Organizational Innovation, Based On Overall Global Needs - Technological Innovation, Social Innovation, Based On The Degree Of Novelty - Incremental Innovations, Radical Innovations , Systemic / Systematic Innovations, Advantages And Disdvantages Of Innovation

10 Hours

CHAPTER - 2

NEED for INNOVATION - Need for innovation- Importance of innovation- business needs, social needs, Technological, Scientific and other needs. Examples of new product development, stages of new product development, concept building, idea generation, product screening, concept testing, market survery, prototyping, test marketing, finalization, manufacturing, advertising.

4 Hours

CHAPTER - 3

PROTECTION to INNOVATION - Safeguarding innovation, methods of protection, copy right, trademarks, Intellectual Property Rights (IPR). Method of Protection, Procedure for IPR. A system is developed in around a product and/or service, Brief description for these procedures.

4 Hours

CHAPTER - 4

INNOVATION EXAMPLES - Products/Services - case study discussions - Branch specific selected examples.

6 Hours

References:

1. Jugaad Innovation - by Navi Radjou, Jaideep Prabhu & Simone Ahuja, Random Business/Random House India 2012.
2. "The Houdini Solution. Put Creativity and Innovation to Work by Thinking INSIDE THE BOX" ,By Ernie Schenck, McGraw Hill, New York 2007.
3. Reverse Innovation: Create Far From Home, Win Everywhere - Vijay Govindarajan, Chris Trimble and Indra K. Nooyi - Harvard Business Press Books - 2012
4. The Little Black Book of Innovation: How It Works, How to Do It? - Scott D. Anthony, Harvard Business School Press - 2011.
5. The Innovator's DNA - Jeff Dyer, Hal Gregersen, Clayton M. Christensen, Harvard Business School Press - 2011

Other Materials

1. Materials For Group/Individual Assignments
2. Paper Clippings - From News Papers, Magazines,
3. Articles From Work Books
4. Presented Papers Of Conferences, Seminar/Symposia Articles
5. Company Brochures, Pamphlets
6. Advertisements Published In News Papers/Magazines
7. Branch's Relevant National And International Society Information
8. Any Other Materials Available In Websites

KANNADA

I/II Semester B.E. (Common to All Branches)

Sub Code : HU 230/HU130

Contact Hrs : 2/week
Total Hrs : 26

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1) ಶ್ರಾವಣ (ಕವನ) ದ.ರಾ.ಬೇಂದ್ರೆ
2) ಡಾ. ವಿಶ್ವೇಶ್ವರಯ್ಯ ವ್ಯಕ್ತಿ ಮತ್ತು ಐತಿಹ್ಯ (ವ್ಯಕ್ತಿಚಿತ್ರ) ಎ.ಎನ್. ಮೂರ್ತಿರಾವ್
3) ದೋಣಿ ಹರಿಗೋಲುಗಳಲ್ಲಿ (ಪ್ರವಾಸ ಕಥನ) ಶಿವರಾಮ ಕಾರಂತ
4) ಅಣ್ಣಪ್ಪನ ರೇಷ್ಮೆ ಕಾಯಿಲೆ (ಪ್ರಬಂಧ) ಕುವೆಂಪು
5) ನಮ್ಮ ಎಮ್ಮೆಗೆ ಮತ್ತು ತಿಳಿಯುವುದೇ (ವಿನೋದ) ಗೋರೂರು ರಾಮಸ್ವಾಮಿ ಅಯ್ಯಂಗಾರ್
6) ಆನೆಹಳ್ಳದಲ್ಲಿ ಹುಡುಗಿಯರು(ವಿಜ್ಞಾನ ಲೇಖನ) ಬಿ.ಜಿ.ಎಲ್ ಸ್ವಾಮಿ
7) ಬೆಡ್ ನಂ. ಏಳು (ಕತೆ) ತ್ರಿವೇಣಿ
8) ರೊಟ್ಟಿ ಮತ್ತು ಕೋವಿ (ಕವನ) ಸು.ರಂ.ಎಕ್ಕುಂಡಿ
9) ಗುಬ್ಬಚ್ಚಿ ಗೋಡು (ಅಂಕಂ ಬರಹ) ಲಂಕೇಶ್
10) ಚೀಂಕ್ರ ಮೇಸ್ತ್ರಿ ಮತ್ತು ಹಾವುಮೀನು (ಪರಿಸರ ಲೇಖನ) ಕೆ.ಪೂರ್ಣಚಂದ್ರ ತೇಜಸ್ವಿ
11) ಗಾಂಧಿ (ಕತೆ) ಬೆಸಗರಹಳ್ಳಿ ರಾಮಣ್ಣ
12) ಬೆಳ್ಳಿಯ ಹಾಡು (ಕವನ) ಸಿದ್ಧಲಿಂಗಯ್ಯ
13) ಎಲ್ಲ ಹುಡುಗಿಯರ ಕನಸು (ಕವನ) ಸವಿತಾ ನಾಗಭೂಷಣ.
14) ನೀರು (ಕತೆ) ಬಸವರಾಜ ಕುಕ್ಕರಹಳ್ಳಿ
15) ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿಯ ಸ್ವರೂಪ (ಪರಿಚಯ ಲೇಖನ) ರಹಮತ ತರೀಕೆರೆ
16) ತಂತ್ರಜ್ಞಾನ ಕಲಿಕೆಯಲ್ಲಿ ಭಾಷೆ (ತಂತ್ರಜ್ಞಾನ ಬರಹ) ಎಸ್.ಸುಂದರ್
17) ಕೊಣವೇಗೌಡ (ಕಾವ್ಯ) ಜಾನಪದ

ಪಠ್ಯ ಪುಸ್ತಕ:

1. ಕನ್ನಡ ಮನಸ್ಸು, ಹಂಪಿ ಕನ್ನಡ ವಿಶ್ವ ವಿದ್ಯಾಲಯ, ಹಂಪಿ.

Scheme of Scheme of Instruction Examination No. of (Periods per week) (Maximum marks) Credits Code No. Subject Theor Tutori Lab Total y al Marks (Cr) (T) (P) CA FE M (L) Professional Ethics EI 321 3 1 40 60 100 3 and Human Values.Â BAPATLA ENGINEERING COLLEGE: BAPATLA (Autonomous) SCHEME OF INSTRUCTION & EXAMINATION FOR ELECTRONICS& INSTRUMENTATION ENGINEERING w.e.f 2010-2011 (Semester System). Fourth Year B.Tech., (SEMESTER â€“ VIII). syllabus autonomous scheme-3-2013-2014. advertisement. Kuvempu University Sahyadri Science College (Autonomous) New Syllabus- Autonomous-III Implemented from academic year 2013-14 Syllabus for B.Sc course in Chemistry I Semesterâ€”Paper I Section A: Inorganic Chemistry Total Hours: 20 Chapter-1: Atomic structure 10 hours (12 marks weightage) Wave nature of electron-de Broglie equation. Learn more about AI for autonomous systems from Microsoft. See how Microsoft is leading digital transformation with AI that automates everyday processes.Â Autonomous systems with Microsoft AI. Get started with autonomous systems and learn how to drive impact with our free autonomous systems starter kit. Start the free ebook series. Ebook series: Moving from automated to autonomous. Learn how autonomous systems are driving real-world innovation from concept to reality. Ebook. This paper proposes a novel autonomous control scheme for equal load current distribution between n parallel-connected, LCL-based, three phase UPS units. The control is based on varying the capacitor reference voltage of each inverter as a function of its own output current, without exchanging information between the inverters. An autonomous system (AS) is a collection of connected Internet Protocol (IP) routing prefixes under the control of one or more network operators on behalf of a single administrative entity or domain that presents a common, clearly defined routing policy to the Internet. Originally the definition required control by a single entity, typically an Internet service provider (ISP) or a very large organization with independent connections to multiple networks, that adhered to a single and clearly defined

Before merging onto roadways, self-driving cars will have to progress through 6 levels of driver assistance technology advancements. SAE defines 6 levels of driving automation ranging from 0 (fully manual) to 5 (fully autonomous). Learn more. 3.1 The autonomous reputation scheme In our autonomous reputation scheme, which was introduced in [2], each peer P 1 keeps a local record of V (P 1, P 2) and V (P 2, P 1) for each peer P 2 with which it has interacted, where V (P 1, P 2) is the total value of resources that have been. donated from P 1 to P 2 in the past. An Autonomous System (AS) is a collection of routers whose prefixes and routing policies are under common administrative control. This could be a network service provider, a large company, a university, a division of a company, or a group of companies. The AS represents a connected group of one or more blocks of IP addresses, called IP prefixes, that have been assigned to that organization and provides a single routing policy to systems outside the AS. @article{shamsoshoara2020autonomous, title={An Autonomous Spectrum Management Scheme for Unmanned Aerial Vehicle Networks in Disaster Relief Operations}, authorÂ About. An Autonomous Spectrum Management Scheme for Unmanned Aerial Vehicle Networks in Disaster Relief Operations using Multi Independent Agent Reinforcement Learning. alirezashamsoshoara.github.io/projects. Topics.

Keywords:Autonomous, Control, Disturbances, Distribution Systems, Interruptions, Monitoring, Power Quality, Troubleshooting. 1. INTRODUCTION. Power quality (PQ) is a prime concern for distribution utilities as well as the end users for a common reason-to ensure that the respective systems function as they are.Â 4. Block Diagram of Troubleshooting Scheme. An important logic to be implemented here is that of selection. Not all disturbances require attention at the central level of monitoring. Learn more about AI for autonomous systems from Microsoft. See how Microsoft is leading digital transformation with AI that automates everyday processes.Â Autonomous systems with Microsoft AI. Get started with autonomous systems and learn how to drive impact with our free autonomous systems starter kit. Start the free ebook series. Ebook series: Moving from automated to autonomous. Learn how autonomous systems are driving real-world innovation from concept to reality. Ebook. This paper proposes a novel autonomous control scheme for equal load current distribution between n parallel-connected, LCL-based, three phase UPS units. The control is based on varying the capacitor reference voltage of each inverter as a function of its own output current, without exchanging information between the inverters. An autonomous system (AS) is a collection of connected Internet Protocol (IP) routing prefixes under the control of one or more network operators on behalf of a single administrative entity or domain that presents a common, clearly defined routing policy to the Internet. Originally the definition required control by a single entity, typically an Internet service provider (ISP) or a very large organization with independent connections to multiple networks, that adhered to a single and clearly defined...