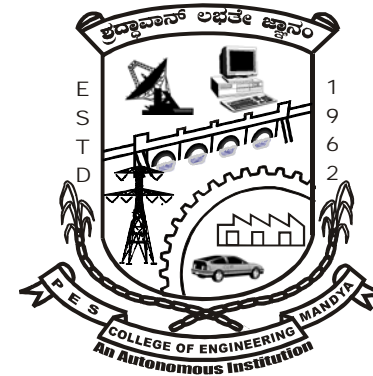


Syllabus

II Semester B.E. Program
Common to all Engineering Branches



P.E.S. College of Engineering

Mandya - 571 401. Karnataka
(An Autonomous Institution under VTU Belgaum)

Grant -in- Aid Institution

(Government of Karnataka)

Accredited by NBA, New Delhi

Approved by AICTE, New Delhi.

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P.E.S. COLLEGE OF ENGINEERING, MANDYA
(An Autonomous Institution)
SCHEME OF TEACHING AND EXAMINATION

II Semester B.E

PHYSICS GROUP

Sl No	Course Code	Course	Teaching Department	Board	Hrs/week L : T : P#	Credits	Examination Marks			Exam Duration Hours
							CIE	SEE	Total	
1.	P08MA21	Engineering Mathematics-II	Mathematics	Maths	4:0:0	4	50	50	100	3
2.	P08PH22	Engineering Physics	Physics	Physics	4:0:0	4	50	50	100	3
3.	P08CV23	Engineering Mechanics	Civil Engg.	Civil Engg.	4:0:0	4	50	50	100	3
4.	P08ME24	Elements of Mechanical Engg.	Mech. Engg	Mech. Engg	4:0:0	4	50	50	100	3
5.	P08EE25	Basic Electrical Engg.	Electrical & Electronics Engg	Electrical & Electronics Engg	4:0:0	4	50	50	100	3
6.	P08MEL26	Workshop Practice	Mech. Engg	Mech. Engg	0:0:3	1.5	50	50	100	3
7.	P08PHL27	Engg. Physics Lab	Physics	Physics	0:0:3	1.5	50	50	100	3
8.	P08HM28	* Constitution of India & Professional Ethics (CIPE)	Humanities, Social Science & Management	HS & M	2:0:0	0	50	-	-	-
9.	P08HM29	*Language (Kannada)	Humanities, Social Science & Management	HS & M	2:0:0	0	50	-	-	-
Total						23	350	350	700	21

L- Lecture, T-Tutorial, P- Practical; CIE : Continuous Internal Evaluation; SEE : Semester End Examinations
* CIPE/Language (Kannada) :- Students shall have to pass these Mandatory Learning course.

P.E.S. COLLEGE OF ENGINEERING, MANDYA
(An Autonomous Institution)
SCHEME OF TEACHING AND EXAMINATION

II Semester B.E

CHEMISTRY GROUP

Sl No	Course Code	Course	Teaching Department	Board	Hrs/week L : T : P#	Credits	Examination Marks			Exam Duration Hours
							CIE	SEE	Total	
1.	P08MA21	Engineering Mathematics-II	Mathematics	Maths	4:0:0	4	50	50	100	3
2.	P08CH22	Engineering Chemistry	Chemistry	Chemistry	4:0:0	4	50	50	100	3
3.	P08CS23	Computer Concepts & C Programming	Computer Science & Engg.	CS & E	4:0:0	4	50	50	100	3
4.	P08MED24	Computer Aided Engg. Drawing	Mech. Engg	Mech. Engg	2:4:0	4	50	50	100	3
5.	P08EC25	Electronics Fundamentals	Electronics & Communication Engg	E & C	4:0:0	4	50	50	100	3
6.	P08CSL26	Computer Programming Lab	Computer Science & Engg.	CS & E	0:0:3	1.5	50	50	100	3
7.	P08CHL27	Engineering Chemistry Lab	Chemistry	Chemistry	0:0:3	1.5	50	50	100	3
8.	P08EV28	*Environmental Studies	Environmental	EV	2:0:0	0	50	-	-	-
9.	P08HU29	*Language (English)	Humanities, Social Science & Management	HS & M	2:0:0	0	50	-	-	-
Total						23	350	350	700	21

L- Lecture, T-Tutorial, P- Practical; CIE : Continuous Internal Evaluation; SEE : Semester End Examinations
* Env. Studies/Language (Kannada) :- Students shall have to pass these Mandatory Learning course.

ENGINEERING MATHEMATICS - II

Course Code : P08MA21
Credits : 4

Total hours : 52
Hrs per week : 04

PART- A Unit-I

Introduction to ordinary differential equations(ODE's)-solutions of first order and first degree differential equations: variables separable, homogeneous, exact, linear and equations reducible to above types.

07 Hrs

Unit-II

Applications first order ODE's - Orthogonal trajectories of cartesian and polar curves.

Newton's law of cooling and simple R-L circuits. Illustrative examples from engineering field.

04 Hrs

Unit-III

Linear differential equations of second and higher order equations with constant coefficients. Homogeneous and non - homogeneous equations. Inverse differential operator. Solutions of initial and boundary value problems.

08 Hrs

Unit-IV

Method of undetermined coefficients. Method of variation of parameters. Solution of Cauchy's homogeneous linear equation and Legendre's linear differential equation.

06 Hrs

PART - B Unit-V

Laplace transforms of elementary functions. Transforms of derivatives and integrals, transforms of periodic function, unit step function and unit impulse function (without proof)- Problems only.

06 Hrs

Unit-VI

Inverse Laplace transforms. Evaluation of inverse transforms by standard methods. Convolution theorem - Problems only. Application to solutions of linear differential equations and simultaneous differential equations.

06 Hrs

Unit-VII

Vector Differentiation- Differentiation of vector functions. Velocity and acceleration of a particle moving on a space curve. Scalar and vector point functions. Gradient, Divergence, Curl and Laplacian. Solenoidal and irrotational vector fields. Vector identities-Problems only.

07 Hrs

Unit-VIII

Vector integration- Integration of vector functions. Line integrals, surface and volume integrals. Green's, Stoke's and Gauss's theorems (without proof). Orthogonal curvilinear coordinates.

08 Hrs

Text Books

- 1.B.S. Grewal: Higher Engineering Mathematics, 40th Edition- 2007, Khanna Publishers, New Delhi.
- 2.B.V.Ramana : Higher Engineering Mathematics, 2nd Edition- 2006, Tata McGraw Hill, New Delhi.

Reference Books

1. Advanced Engineering Mathematics: - by E. Kreyszig, John Wiley & Sons, 6th Ed.
2. Engineering Mathematics:- by N.P.Bali and Manish Goyal, Laxmi Publications, 7th Ed., 2007.
3. Calculus – I & II :- by Tom.M.Apostol, Addison Wesley, 2006

ENGINEERING PHYSICS

Course Code : P08PH 12 / 22

Credits : 4

Total Hrs : 52

Hrs/week : 04

PART - A

Unit : I Modern Physics: 7 Hrs

Black body radiation. Emissive power and Absorptive power. Stefan-Boltzmann law. Distribution of black body spectrum. Statements of Wien's law and Rayleigh-Jean's law (Qualitative). Einstein's concept of quantum theory of radiation - derivation of Planck's law from Einstein's coefficients. Reduction of Rayleigh-Jean's law, Stefan's law and Wein's displacement law from Planck's law. Surface temperature of sun.

Unit : II Electrical Conductivity in Metals: 7 Hrs

Free electron concept. Classical free-electron theory - Assumptions. Drift velocity. Mean collision time and mean free path. Relaxation time. Expression for electrical conductivity in metals. Effect of impurity and temperature on electrical resistivity of metals. Failure of classical free-electron theory. Quantum free-electron theory - Assumptions. Fermi-Dirac Statistics. Fermi-energy - Fermi factor. Density of states (with derivation). Merits of quantum free-electron theory.

Unit : III Superconductivity : 6 Hrs

Temperature dependence of resistivity in normal and superconducting metals. Effect of magnetic field (Meissner effect). Type-I and Type-II superconductors. Temperature dependence of critical field. BCS theory (qualitative). High temperature superconductors. Applications of superconductors - superconducting magnets, Maglev vehicles and SQUIDS.

Unit : IV Special Theory of Relativity : 6 Hrs

Frames of reference. Basic postulates of theory of relativity. Lorentz transformation equations (no derivation). Lorentz transformations are invariant. Lorentz-Fitzgerald 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.

PART - B

Unit : V Quantum Mechanics: 8 Hrs

Concept of matter waves, deBroglie wavelength. Davisson and Germer experiment. Heisenberg's uncertainty principle and its physical significance (no derivation). Application of uncertainty principle (Non-existence in the nucleus). Setting up of time-independent one dimensional Schrodinger wave equation.

Eigen values and eigen function. Application of Schrodinger wave equation - Energy eigen values for a free particle. Energy eigen values of a particle in a potential well of infinite depth.

Unit : VI Dielectric and Magnetic Properties of Materials : 6 Hrs

Dielectric constant and polarisation of dielectric materials. Types of polarisation. Equation for internal fields in solids (one dimensional). Clausius-Mossotti equation. Ferro and Piezo-electricity (qualitative). Frequency dependence of dielectric constant. Classification of magnetic materials. Soft and Hard magnetic materials, Applications.

Unit : VII Crystal Structure and X-rays: 7 Hrs

Crystal lattice, basis, unit cell, primitive cell, Bravais lattice, lattice parameters and crystal systems. Direction and planes in a crystal. Expression for inter - planar spacing. Miller indices. Production of X-rays, Properties of X-rays, Continuous X-ray spectra and characteristic X-ray spectra. Bragg's law, Bragg's X-ray diffraction, Bragg's X-ray spectrometer. Mosley's law and its significance. Uses of X-rays.

Unit : VIII Nanomaterials and Ultrasonics: 5 Hrs

Introduction to Nanoscience and Nanotechnology. Nanomaterials, Carbon nanotubes, mechanical and electrical properties of carbon nanotubes and applications. Ultrasonic waves and Non-destructive testing of materials. Measurement of ultrasonic velocity in liquids and solids. Determination of elastic constants in solids and liquids.

Reference Books :

1. Modern Physics - R. Murugesan, Kiruthiga Sivaprasath, S. Chandan & company LTD, RamNagar, New Dehli.
2. Modern Physics - Duggal and Chabra, S. Chandan & company LTD, RamNagar, New Dehli.
3. Modern Physics - Kenneth Krane - John Wiley and sons, India Pvt, LTD.

Text Books :

1. Engineering Physics - R.K.Gaur and S.L.Gupta, Dhanpat and Sons, New Delhi.
2. Solid State Physics - S.O.Pillai, New Age International Publisher, New Delhi.
3. A Detailed Text Book of Engineering Physics - S.P.Basavaraju, Subhas Stores, Bangalore.

ENGINEERING MECHANICS

Course Code : P08CV13/23
Credits : 4

Total Hrs. : 52
Hrs/ Week : 04

Part -A

Unit-I

Introduction and coplanar concurrent force system: Classification - definitions of particle, rigid body, mass, time, continuum - force system - system of measurements - principle of transmissibility of forces - resultant of forces. Parallelogram law, polygon law - resolution of forces - composition of coplanar concurrent forces - equilibrium of particles - free body diagram - Lami's theorem and applications. 6 Hrs

Unit-II

Coplanar Non-concurrent forces : Moment of a force - Varignon's theorem - force-couple system - composition of coplanar parallel and non-concurrent forces - equilibrium of rigid bodies. 7 Hrs

Unit-III

Support reactions : Types of supports for planar structure - simple support, roller support, hinged support, fixed support - numerical problems. Types of loads - concentrated load, uniformly distributed load, uniformly varying load. 6 Hrs

Unit-IV

Centroid and centre of gravity : Centroid of rectangular, triangular, circle, semicircle, quarter circle, sector laminae from first principles. Centre of mass and centroid, centroid of composite sections. 7 Hrs

Part -B

Unit-V

Moment of Inertia: Introduction to moment of inertia of plane figures, radius of gyration, parallel axis theorem, perpendicular axis theorem, polar moment of inertia, moment of inertia of plane geometrical figures by integration, moment of inertia of composite sections. 7 Hrs

Unit-VI

Friction : Introduction, types of friction, characteristics of dry friction, laws of friction, angle of friction, angle of repose, cone of friction, application - body on horizontal plane and inclined plane subjected to forces, ladder friction, and wedge friction. 8 Hrs

Unit-VII

Kinetics of particles : D'Alembert's principle, analysis of lift motion, motion of two connected bodies, introduction to work, power and energy, work done by force, energy principle. 6 Hrs

Unit-VIII

Impulse and momentum: Linear impulse, law of conservation of momentum, collision of elastic bodies. Direct and indirect impact - direct central impact, oblique central impact, loss of kinetic energy during impact. 5Hrs

REFERENCES :

1. Ferdinand L. Singer : Engineering Mechanics- Statics and Dynamics, Harper and Row, Publishers Inc.
2. Kumar K.L : Engineering Mechanics, Tata McGraw-Hill Publishing Comp. Ltd., New Delhi.
3. Ramamrutham S: A text book of Applied Mechanics, Dhanpatrai and sons
4. S. Rajashekar, G. Shankarabramanian: Engineering Mechanics- Statics and Dynamics, Vikas Publishing House, 1999.
5. Beer Ferdinand P and Johnson F.R (Jr): Mechanics for Engineers, Tata McGraw-Hill Publishing Comp. Ltd., New Delhi.

ELEMENTS OF MECHANICAL ENGINEERING

Course Code : P08ME14/24

Credits : 4

Total hours : 52

Hrs per week : 04

PART-A

Unit-I

Introduction: Prime movers such as Hydraulic turbines, Gas turbines, Steam turbines and Internal combustion Engines. Steam boilers- Classification of boilers and their applications. Steam formation, Types of steam, Definitions-specific volume, enthalpy and internal energy. Description of pressure – Temperature diagram, Temperature - Volume diagram and Temperature-enthalpy diagram. 7 Hrs

Unit-II

Steam and Gas turbines : Steam turbines - Classification, principal of operation of impulse and reaction steam turbines. Compounding of Impulse turbines. Advantages of steam turbines. Gas turbines - Classification of gas turbines. Working principle of open cycle and closed cycle gas turbine. Comparison between open cycle and closed cycle gas turbine. 6 Hrs

Unit-III

I.C. Engines - Classification, and main parts of Otto & Diesel cycles. Working principle of 2 stroke & 4 stroke petrol engine and 4 stroke diesel engines. Comparison between petrol and diesel engines, and comparison between 2 stroke & 4 stroke engines. Simple problems based on indicated power, brake power, indicated thermal efficiency, brake thermal efficiency & mechanical efficiency. 7 Hrs

Unit-IV

Refrigeration and air conditioning – Types of refrigerants and properties refrigerants. Definition of COP, refrigerating effect and units of refrigeration. Working principles vapor compression refrigeration, and vapor absorption refrigeration. Working principles of air conditioner and its application. 6 Hrs

PART-B

Unit-V

Lathe and Drilling machines: Classification of lathe, Specification of lathe. Principle of working of a center lathe, and major parts of a lathe. Lathe operations- cylindrical turning, facing, thread cutting, drilling, knurling. and taper turning. Drilling machine - Classification of drilling machines.

Specification of radial drilling machine. Twist drill and its nomenclature. Bench drilling machine and radial drilling machine. Drilling machine operations- drilling, boring, reaming, tapping, counter sinking and counter boring. 7 Hrs

Unit-VI

Milling and Grinding machine- Classification of milling machines, principle of milling operation. Up milling and down milling operations and their comparison. Milling operations - slab milling, end milling, slot milling. Grinding machine- Classification of grinding machines, principle of grinding and operation of grinding machine. List of commonly used abrasives and bonding materials and their properties. Super finishing process - Honing, lapping and superfinishing . 7 Hrs

Unit-VII

Joining Process: Soldering, Brazing and Welding - Principles of Soldering, types and properties of solders, and methods of soldering. Brazing, and its applications, Welding- Classification of Welding process, principle of electric arc welding, and its applications. Principle of Oxy- acetylene gas welding processes, Types of flames, comparison between soldering, brazing and welding. 6 Hrs

Unit-VIII

Power transmission - Belt drives- classification and applications. Definitions – velocity ratio, creep and slip. Idler pulley, stepped cone pulley, fast and loose pulley. Derivations for the length of the belt in open belt drive and closed belt drive. Simple problems on flat belt for length of the belt, velocity ratio, belt tensions and power transmitted. V- Belt, comparison between v- belt and flat belt. Gear – Types of gears and Gear drives. 6Hrs

TEXT BOOKS:

A Text Book of Elements of Mechanical Engineering, Kestoor Praveen and Ramesh M R, 2nd edition, 2006, Interline publishing, Bangalore.

A Text Book of Mechanical Engineering Science, K. R. Gopalakrishna, 15th edition, 1999, Subhash Publications, Bangalore.

REFERENCE BOOKS :

The Elements of Workshop Technology, Vol-1 & 2, S.K.H. Chouadhury, A.K.H. Chouadhury, Nirjhor Roy, 11th Edition, 2001, Media Promoters and Publishers, Mumbai.

Fundamentals of Modern Manufacturing, M.P. Groover, Prentice Hall, 1998. Elements of Mechanical Engineering Sciences, K.V.A. BALaji and K. Rama Sastry.

BASIC ELECTRICAL ENGINEERING

Course Code : P08EE15/25
Credits : 4

Total hours : 52
Hrs per week : 04

PART-A Unit - I

a) D.C. Circuits: Ohm's Law and Kirchoff's Laws, analysis of series, parallel & series parallel resistive circuits excited by independent voltage sources, Power and Energy calculations. 04 Hrs

b) Electromagnetism: Basic concepts of Electromagnetism & magnetic circuits, Faraday's laws, Lenz's Law, Fleming's rules, Statically & Dynamically induced EMF's, concept of Self Inductance, Mutual Inductance and Coefficient of coupling, Energy stored in Magnetic field. Response of capacitor with DC & AC excitation. 05 Hrs

Unit – II

Single Phase AC circuits: Generation of sinusoidal AC voltage, definition of Average value, RMS value, Form factor and peak factor of sinusoidally varying voltage and current, meaning of lagging and leading of sinusoidal wave, Real power, Reactive power, Apparent power and Power factor. Analysis of R, L & C circuits, series, parallel & series parallel circuits with R-L, R-C and R-L-C elements. 08 Hrs

Unit – III

Three Phase circuits: EMF Generation, Necessity and advantages of three phase system, Phase sequence, balanced supply and load, relationship between line and phase values for balanced star and delta connections, measurement of power in a three phase balanced circuit. 06 Hrs

Unit - IV

a) **Measuring Instruments:** Construction and working of Dynamometer type wattmeter and Single phase induction type energy meter (problems excluded) 02 Hrs

b) **Domestic wiring:**

Service mains, Lighting and Heating circuits, examples of heating & lighting loads, wiring circuits for Two-way and Three way control of a lamp.
Electrical Safety – Electric shock and its precaution
Protection – Fuses; necessity and types of Earthing

04 Hrs

PART - B Unit - V

DC Machines:

a) Working principle of DC machine as generator and motor, constructional features, EMF equation of generator, types of armature winding, types of DC generators.

b) Back EMF and its significance, types of DC motors, torque equation of DC motor, characteristics and applications, necessity of a starter.

07 Hrs

Unit – VI

Transformers: Principle of operation and construction of single phase transformers (core and shell type) EMF equation. Transformer on no - load and load, power losses, efficiency and voltage regulation (OC & SC tests, Equivalent circuits and phasor diagrams are excluded), illustrative problems on EMF equation and efficiency only. 05 Hrs

Unit – VII

Synchronous Generators: Principle of operation. Types and constructional features, Concept of winding factor (excluding derivation), EMF equation.

04 Hrs

Unit – VIII

Three phase induction motors: Concept of rotating magnetic field, principle of operation, types and constructional features, Slip and its significance, Torque-slip characteristics, Necessity of a starter, Applications of squirrel cage and slip ring motors, Illustrative examples only on slip calculations.

04 Hrs

TEXT BOOKS:

E. Hughes, "Electrical technology", International Students 9th Edition, Pearson, 2005

Rajendra Prasad, "Fundamentals of Electrical Engineering", Prentice hall of India Pvt, Ltd, 2005, ISBN: 81-203-2729-2

M.V Rao, "Basic Electrical Engineering"

WORKSHOP PRACTICE

Course Code : P08MEL16/26
Credits : 1.5

Total hours : 42
Hrs per week : 03

1. Fitting
 - a. Study of fitting tools and operations
3 Hours
 - b. Minimum 4 models involving rectangular, triangular, and semi circular joints.
24 Hours
2. Welding
 - a. Study of electric arc welding tools & equipments
3 Hours
 - b. Minimum 4 Models- electric arc welding-Butt joint, Lap joint, T-joint & L-joint.
6 Hours
3. Study and demonstration of Carpentry tools, joints and operations.
3 Hours
4. Study and demonstration of Sheet metal and soldering work.
3 Hours

Scheme of Examination:

Fitting : 30 Marks
Welding : 10 Marks
Viva Voce : 10 marks

Reference Book:

1. The Elements of Workshop Technology -, Vol 1 & 2, S.K.H. Choudhury, A.K.H.Choudhury, Nirjhar Roy, 11th edition, 2001, Media Promoters and Publishers, Mumbai.

ENGINEERING PHYSICS LABORATORY

Course Code : P08PHL17/27
Credits : 1.5

Total hours : 36
Hrs per week : 03

(Note: Any Five experiments from each group are to be done.)

Group - A

01. Newton's ring - Determination of radius of curvature of a plano-convex lens.
02. Uniform bending - Determination of Young's modulus of the given material.
03. Searl's double bar - Determination of elastic constants (q , k & σ) of the given material.
04. Diffraction grating - Determination of wavelengths of the given source.
05. Planck's constant - Determination of Planck's Constant.
06. Biprism - Determination of wavelength of the monochromatic source.

Group - B

07. Series and Parallel LCR Resonance circuit - Determination of self inductance of the coil.
08. Transistor - Draw the output characteristics of a transistor in CE-mode and hence find current gain and output resistance.
09. Dielectric constant - Determination of dielectric constant by charging and discharging of a capacitor.
10. Fermi energy - Determination of Fermi energy and Fermi temperature of the given coil.
11. Stefan's law - Verification of Stefan's law and determination of Stefan-Boltzmann constant.
12. Ultrasonic interferometer - Determination of ultrasonic velocity in liquid.

Note:

- 1) Students must done two experiments, one from group-A and another from group-B in examination in the duration of three hours.
- 2) Each experiment carries 25 marks. The total marks for practical examination is 50 marks.

ENGINEERING CHEMISTRY

Course Code : P08CH12/22

Total hours : 52

Credits : 4

Hours per week : 04

PART - A

Unit - I

Renewable and non – renewable energy sources.

Chemical Energy Sources.

Introduction to energy; Fuels – Definition, classification, importance of hydrocarbons; Calorific value – definition, Gross and Net calorific values (SI units). Determination of calorific value of a solid fuel using Bomb calorimeter and numerical problems. Petroleum cracking – fluidised catalytic cracking. Reformation of petrol. Knocking – mechanism, Octane number, cetane number, prevention of knocking, anti-knocking agents, leaded and unleaded petrol. Alternative energy – Power alcohol. 6 Hrs

Unit - II

Electrochemical Energy Sources.

Electrodes : Single electrode potential – origin, Measurement of single electrode potential, Standard electrode potential, Derivation of Nernst equation Definition, problems. Types of electrodes, primary and secondary reference electrodes, calomel electrode, Ag / AgCl electrode, Ion – selective electrode. Construction, and working principle of glass electrode, determination of pH of solution using glass electrode and numerical problems.

Electrochemical Cells: Introduction, EMF of a cell, notation and sign conventions, and numerical problems. Types of cells. Classification of galvanic cell – primary, secondary, concentration cells. Fuel cells introduction, advantages, Construction and working of H₂-O₂ and Methanol-Oxygen fuel cells. 8 Hrs

Unit – III

Battery Technology and Solar Energy.

Batteries- Basic concepts, battery characteristics. Classification of batteries – primary, secondary and reserve batteries. Classical Batteries – Construction working principle and applications of lead – acid, Zn – air, Nickel-Metal hydride and lithium-MnO₂ batteries.

Semiconductor: types, production of p-n junction. Construction, working and application of photovoltaic cells. Production of solar grade silicon by crystal pulling technique method (Czochlarski). 6 Hrs

Unit - IV

Corrosion Science and Technology.

Corrosion: Definition, Chemical corrosion and Electro-chemical theory of corrosion, Types of corrosion, Differential metal corrosion, Differential aeration corrosion (Pitting and water line corrosion), stress corrosion – caustic embrittlement. Factors affecting the rate of corrosion.

Corrosion Control: Proper selection and designing of materials. Cathodic and Anodic protection. Inorganic coating – Anodizing, Metal coating by hot dipping process– Galvanization and Tinning, Corrosion Inhibitors. 6 Hrs

PART - B

Unit – V

Electro plating and Electroless plating.

Technological importance of metal finishing. Significance of polarization, decomposition potential and over-voltage in electroplating processes. Electroplating – process, factors affecting the nature of electrodeposit, surface preparation and electroplating of Ni (by Sulphate) and Au (cyanide process). Electroless plating: Distinction between electroplating and electroless plating, advantages of electroless plating. Electroless plating of copper on PCB and Nickel.

Liquid Crystals and their Applications.

Introduction, classification – Thermotropic and Lyotropic with examples. Types of mesophases-nematic, chiral nematic (cholesteric), smectic and columnar. Applications of liquid crystals in display systems. 6 Hrs

Unit - VI

Material science and Technology.

High Polymers: Definition, types of Polymerization – Addition and Condensation and co – polymers with examples.

Plastics: Types, distinguish between thermoplastic and thermosetting plastic. Synthesis and Engg applications of some important Plastics-Teflon, PMMA, polyurethane and bakelite.

Elastomers: Introduction, deficiencies of natural rubber and advantages of synthetic rubber. Synthesis and applications of Neoprene & Butyl rubber. Vulcanization and compounding of rubber.

Adhesives: Manufacture and applications of Epoxy resins.

Cement: Introduction, raw materials, types, mixing of additives to cement, properties and testing of cement and applications.

Lubricants: Definition, functions, properties, types, important characteristics, applications of lubricants. 8 Hrs

Unit - VII

Water Technology.

Introduction, Impurities in water, soft and hard water, scale and sludge, boiler scale, ill effects. Preventions of boiler feed water by internal and external treatments – hotline soda - lime process and ion exchange process. Purification of water for municipal supply. Potable water, desalination of water – Electrodialysis and Reverse Osmosis. 6 Hrs

Unit – VIII

Environmental Chemistry.

Air pollution: Introduction, sources, ill effects and controls of oxide of sulphur and oxides of nitrogen. Acid rain, global warming and ozone depletion. Water pollution: Introduction, sources, ill effects Biochemical Oxygen Demand and Chemical Oxygen Demand. Numerical problems on BOD and COD. Sewage treatment: primary, secondary and tertiary treatments. 6 Hrs

Text Books

1. Engineering Chemistry by M.M.Uppal, Khanna Publishers, Sixth Edition, 2001
A text Book Engineering Chemistry by Jain and Jain, Dhanapatrai publications, New Delhi. 16th Edition, 2006.

Reference Books

1. Principals of Physical Chemistry B.R.Puri, L.R.Sharma & M.S.Pathania, S.Nagin Chand & Co., 33rd Ed., 2006.
2. Text Book of polymer Science by F.W. Billmeyer, John Wiley & Sons, 7th Edition, 2005
3. Liquid crystals and plastic crystal, Vol-I, edited by G.W.Gray and P.A.Winsor, Ellis Horwood series in Physical Chemistry, New York.(p.No. 106-142) 5th Edition 2007
4. Corrosion Engineering by M.G.Fontana, Mc Graw Hill publication. 9th Edition 2007.
5. Environmental Chemistry by stanely E.manahan, 7th Edition, Lewis publishers, 2006.
6. Text Book of Industrial Chemistry by B.K.Sharma , Goel Publishing House, Meerut, 10th Edition.

COMPUTER CONCEPTS AND C PROGRAMMING

Course Code : P08CS13/23
Credits : 4

Total hours : 52
Hours per week : 04

PART - A

Unit-I

Computer definition. Computers for individual users. Computers for organizations. The parts of a computer system. The information processing cycle. The essential computer hardware

Interacting with Computer

The keyboard, The Mouse. Other data input Devices - Optical Input Devices, Audio visual Input Devices. Video and sound - Data projectors, Sound systems. Commonly used printers - Ink Jet Printers, Laser Printers. Scanners. 4 Hrs

Unit-II

Processing Data

How computers represent data, how computers process data, factors affecting processing speed, microcomputer processors, extending the processor's power to other devices.

Storing Data

Types of storage devices, Measuring and improving drive performance. Pendrives. 6 Hrs

Unit-III

Operating Systems

Operating system basics - The purpose of operating system, Types of operating system, Providing a user interface, PC operating systems- DOS; Windows -NT workstation, 9X, 2000Professional, XP; Linux for the desktop, Microsoft Vista.
Networks and the Internet
Networking basics - The uses of a network, Common types of networks, Network topologies and protocols, Definition of Internet, Internet's major services, Understanding the World Wide Web and E-mail. 7 Hrs

Unit-IV

Algorithms and Flowcharts

Algorithms, Flowcharts. Writing algorithms and drawing flowcharts for simple exercises like Swapping contents of 2 variables, Largest of given three numbers, Solving a given quadratic equation, Factorial of a given integer.

Constants, Variables and Data types

Characters set, C tokens, Keywords and Identifiers, Constants, Variables, Data types, Declaration of variables.

Operators and Expressions

Arithmetic operators, Relational operators, Logical operators, Assignment operators, Increment and Decrement operators, Conditional operator, Bitwise operators, Special operators, Arithmetic expressions, Evaluation of expressions, Precedence of Arithmetic operators, Type conversions in expressions, Operator precedence and associativity. 8 Hrs

PART - B

Unit- V

Managing Input and Output Operations

Reading a character, writing a character, formatted Input and Output.

Decision making and Branching

Decision making with if statement, Simple if statement, The *if...else* statement, Nesting of *if...else* statements, The *else ... if* ladder, The switch statement, The ?: operator, The goto statement, break and continue statement. 7 Hrs

Unit- VI

Decision making and Looping

The *while* statement, the *do* statement, the *for* statement, jumps in Loops with suitable examples. 6 Hrs

Unit- VII

Arrays

One - dimensional Arrays, Declaration of one - dimensional Arrays, Initialization of one - dimensional Arrays, Two - dimensional Arrays, Initializing two-dimensional Arrays. 6 Hrs

Unit- VIII

User-defined Functions

Need for User-defined Functions, A multi-function Program, Elements of User defined Functions, Definition of Functions, Return Values and their Types,

Function Calls, Function Declaration, Category of Functions, No Arguments and no Return Values, Arguments but no Return Values, Arguments with Return Values, No Argument but Returns a Value, passing array has arguments to a function. Storage classes. Structure and union declaration. User defined data types. 8 Hrs

Text Books

1. Introduction to Computers, Peter Norton, Sixth Edition, Tata McGraw Hill, 2005
2. Programming in ANSI C, E. Balagurusamy, Tata McGraw Hill 3rd Edition.

Reference Books

1. Introduction to Computer Science, IITL Education Solutions Ltd., Pearson Education, 2004.
2. Fundamentals of Computers, V.Rajaraman, 4th Edition, PHI 2005.
3. Programming Techniques through C, M.G. V. Murthy, Pearson Education, 2002.
4. Computer concepts and C programming – a holistic approach to C learning” B.S.Anami, et. Al. Prentice Hall of India, New Delhi.

COMPUTER AIDED ENGINEERING DRAWING

Course Code : P08MED14/24
Credits : 4

Total hours : 78
Hours per week : 06

1. Introduction to Computer Aided Sketching

Introduction, Drawing Instruments and their uses, Dimensioning and free hand practicing. Computer screen, layout of the software, standard tool bar/menus and description of most commonly used tool bars, navigational tools. Creation of 2D 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 namely tangency, parallelism, inclination and perpendicularity.

06 Hrs

2. Orthographic Projections

Introduction, Planes of projection, reference line and conventions employed, Projections of points in all the four quadrants, Projections of straight lines (located in First quadrant/first angle projections only), True and apparent lengths, True and apparent inclinations to reference planes (No mid point and application problems).

12 Hrs

3. Projections of Plane Surfaces (First Angle Projection Only)

Projections of plane surfaces – triangle, square, rectangle, pentagon, hexagon and circle, planes in different positions by change of position method only (No problems on punched plates and composite plates).

12 Hrs

4. Projections of Solids (First Angle Projection Only)

Projections of right regular tetrahedron, hexahedron (cube), prisms, pyramids, cylinders and cones in different positions. (No problems on octahedrons and combination of solids)

21 Hrs

5. Development of Lateral Surfaces of Solids

Introduction, Section planes, Sections points, Development of lateral surfaces of right regular prisms, pyramids, cylinders and cones, their frustums and truncations. (No problems on lateral surfaces of trays, tetrahedrons, spheres and transition pieces).

15 Hrs

6. Isometric Projection (Using Isometric Scale Only)

Introduction, Isometric scale, Isometric projection of simple plane figures, Isometric projection of tetrahedron, hexahedron(cube), right regular prisms, pyramids, cylinders, cones, spheres, hemispheres and combination of (maximum of two) solids.

12 Hrs

Text Books:

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

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

Reference Books:

Computer Aided Engineering Drawing - S. Trymbaka Murthy, -I.K. International Publishing

House Pvt. Ltd., New Delhi, 3rd revised edition- 2006.

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

ELECTRONICS FUNDAMENTALS

Course Code : P08EC15/25
Credits : 4

Total hours : 52
Hours per week : 04

PART - A

Unit –I

SEMICONDUCTOR DIODES AND APPLICATIONS: p-n junction diode, Characteristics and Parameters, Diode approximations, DC load line, Temperature dependence of p-n characteristics, AC equivalent circuits, Zener diodes Half-wave diode rectifier, Ripple factor, Full-wave diode rectifier, Shunt capacitor - Approximate analysis of capacitor filters, Power supply performance, Zener diode voltage regulators, Numerical examples as applicable.(T1-2.1,2.2,2.3,2.4:2.5,2.6,2.9,R1- 20.1, 20.2, 20.3, 20.4, 20.8; T1- 3.5, 3.6).

08Hrs

Unit –II

TRANSISTORS: Bipolar Junction transistor, Transistor Voltages and currents, amplification, Common Base, Common Emitter and Common Collector Characteristics, DC Load line and Bias Point.
(T1-4.1,4.2,4.3,4.4,4.5,4.6,5.1)

06 Hrs

Unit –III

BIASING METHODS: Base Bias, Collector to Base Bias, Voltage divider bias, Emitter bias ,Comparison of basic bias circuits, Bias circuit design, Thermal Stability of bias Circuits (Qualitative discussions only).
(For Units II & III: T1- 5.2,5.3,5.4,5.5,5.7,5.9).

06 Hrs

Unit –IV

AMPLIFIERS & OSCILLATORS: Decibels and Half power points, Single Stage CE Amplifier and Capacitor coupled two stage CE amplifier(Qualitative discussions only), Series voltage negative feedback and Additional effects of Negative feed back(Qualitative discussions only), The Barkhausen Criterion for Oscillations, BJT RC phase shift oscillator, Hartley ,Colpitts and crystal oscillator (Qualitative discussions only) Numerical problems as applicable.
(T1 - 8.2, 12.1, 12.3, 13.1, 13.7; R1-17.15, 17.16, 17.17, 17.18, 17.19)

06 Hrs

PART - B

Unit –V

OTHER DEVICES: Silicon Controlled Rectifier (S.C.R), SCR Control Circuits, More S.C.R applications; Unijunction transistor, UJT applications, Junc-

tion Field effect Transistors(Exclude Fabrication and Packaging), JFET Characteristics, FET Amplifications, Numerical examples as applicable , LED, Seven segment display, (T1 -19.1, 19.2, 19.3, 19.7, 9.1, 9.2, 9.4,20.2,20.3

07 Hrs

Unit –VI

INTRODUCTION TO OPERATIONAL AMPLIFIERS: Ideal OPAMP, Saturable property of an OP AMP inverting and non inverting OPAMP circuits, need for OPAMP, Characteristics and applications - voltage follower, addition, subtraction, integration, differentiation; Numerical examples as applicable, Cathode Ray Oscilloscope (CRO) (T2 -11.1-11.8, 9.6)

06 Hrs

Unit –VII

COMMUNICATION SYSTEMS: Block diagram, Modulation, Radio Systems, Superhetrodyne Receivers, Numerical examples as applicable (T2 - 13.1, 13.2, 13.4, 13.5)

NUMBER SYSTEMS: Introduction, decimal system, Binary, Octal and Hexadecimal number systems, addition and subtraction, fractional number, Binary Coded Decimal numbers.

06 Hrs

Unit –VIII

DIGITAL LOGIC: Boolean algebra, Logic gates, Half-adder, Full-adder, Parallel Binary adder. (For Number Systems & Digital Logic: T2: 14.1 to 14.14)

07 Hrs

TEXT BOOKS:

1. (T1) Electronic Devices and Circuits: David. A. Bell; PHI, New Delhi, 2004
2. (T2) Electrical and Electronics & Computer Engineering for Scientists and Engineers Second Edition -K.A. Krishnamurthy & M.R. Raghuvver- New Age International Publishers (Willey Eastern) 2001

REFERENCE BOOKS:

1. (R1). Electronic Devices and Circuits: Jacob Millman, Christos C. Halkias TMH, 1991 Reprint 2001
2. (R2) Electronic Communication Systems, George Kennedy, TMH 4th Edition
3. (R3) Digital Logic and Computer Design, Morris Mano, PHI, EEE

COMPUTER PROGRAMMING LAB

Course Code : P08CSL16/26

Credits : 1.5

Total hours : 36

Hrs per week : 03

- Exercise on Microsoft Word
 - to write letter to the bank manager for study loan
 - to create time table
- Exercise on Microsoft Excel & Power point.
 - to input three test marks of n students and calculate the following
 - average of best of two test marks
 - to find the percentage
 - declaration of class
 - draw graph for class declaration and fail percentage
- Create and Execute a DOS batch file HELPDOS.BAT which provides on-line help facility for the following DOS commands – date, time.
- Create and execute a DOS batch file MYMOVE.BAT with 2 parameters, which creates a new directory (given by parameter 1) and moves the file (given by parameter 2) from the current directory to newly created directory.
- Write Program to Compute the Commission on Sales as per the following policy
 - if Sales<Rs 1000/- no Commission
 - if Sales>1000 & < 25,000 then commission is 10% of sales
 - if Sales is> = 25,000 then commission is 200/- Plus 8% of sales exceeding Rs 1000/-
- Write a C program to find and output all the roots of a given quadratic equation for non - zero coefficients (Using Switch Statement)
- Write a C program to generate and print first 'N' Fibonacci numbers & find their sum (Use looping Constructs)
- Write a C program to find the GCD and LCM of two integers and output the results along with the given integers. Use Euclid's Algorithm (Use looping constructs)
- Write a C program to print 2nd largest number among list of numbers without using array

- Write a C program to print all prime numbers within a given range
- Write a C program to reverse a given four digit integer number and print the reversed number, even digits in a given number & their sum.
- Write a C program to input N real numbers into a single dimension array. Sort the numbers in descending order using bubble sort.
- Write a C program to input N real numbers in ascending order into a single dimension array. Conduct a binary search for a given key integer number and report success or failure in the form of a suitable message
- Write a C program to evaluate the given series
$$S = 1^2 + 2^3 + 3^4 + 4^5 + 5^6 + 6^7$$
- Write a C program to evaluate the following sine series
$$\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \dots \text{ upto required accuracy}$$
- Write a C program to read two matrices A(MxN) and B(PxQ) and compute the product of A and B after checking compatibility for multiplication. Output the input matrices and the resultant matrix with suitable heading and format.(Using two dimension arrays where array size M,N,P,Q<=3)
- Write C user defined functions
 - to input N integer numbers into a single dimension array
 - to conduct a linear search. Using these functions, write a C program to accept the N integer numbers & given key integer number and conduct a linear search. Report success or failure in the form of a suitable message.
- Write C user defined functions
 - To find all three digit Armstrong numbers (A Armstrong number is the sum of cubes of its digit is equal to the number. ex: $15^3=1^3+5^3+3^3$) Store those number in an array
 - Print the resultant array
- Write C user defined functions
 - To input N integer numbers into a single dimension array
 - To sort the integer numbers in descending order using selection sort technique
 - To print the single dimension array elements. Using these functions,

write a C program to input N integer numbers into a single dimension array, sort them in descending order, and print both the given array & the sorted array with suitable headings.

20. Write C user defined functions to display the given numbers in words (ex:-123 is one, two, three)

21. Write C user defined functions

- i) To input N real numbers into a single dimension array
- ii) Compute their mean
- iii) Compute their variance
- iv) Compute their standard deviation

Using these functions, write a C program to input N real numbers into a single dimension array, and compute their mean, variance & standard deviation. Output the computed results with suitable headings

22. Write & test a function digit() :

Function : int digit (int n, int k)

This function returns the kth digit of a +ve integer n. Example if n is the integer 29,415, then call digit(n,0) would return the digits 5 & call digit(n,2) would return the digit 4. Note that the digits are numbered from right to left beginning with the "Zeroth digit"

NOTE:

For examination similar problems may be asked with little changes.

ENGINEERING CHEMISTRY LAB

Course Code : P08CHL17/27

Credits : 1.5

Total hours : 36

Hrs per week : 03

(Minimum Five experiments shall be conducted from each section)

Part – A: - Volumetric analysis

1. Determination of % of calcium oxide in cement solution.
2. Determination of % of copper in brass.
3. Determination of % of Mn in pyrolusite ore.
4. Determination of % of iron in haematite ore.
5. Determination of Chemical oxygen demand of industrial waste water.
6. Determination of Total hardness of water by EDTA method.

Part – B: - Instrumental analysis

1. Determination of pKa value of a weak acid using pH meter.
2. Determination of Viscosity coefficient of liquid using viscometer.
3. Determination of Mohr's salt (FAS) by potentiometric method.
4. Determination of Copper by colorimetric method.
5. Determination of Acid mixture by conductometric method.
6. Determination of Sodium by flame photometric method.

Reference books.

1. A text book of quantitative analysis by A.I. Vogel's.
2. A text book of Instrumental analysis by Willard, Merit, Dean and Settle, Sixth edition 2005.

Note: -

Examination : First experiment is common from part A and Second experiment is different from part B.

ENVIRONMENTAL STUDIES

(Mandatory Learning Course)

Course Code : P08EV18/28

Total hours : 26

Hours per week : 02

UNIT – I

Environment – Definition, Eco system – Balanced Ecosystem, Human activities – Food, Shelter, Economic and Social Security.

03 Hrs

UNIT – II

Transportation activities, Environmental Assessment. Sustainable Development.

03 Hrs

UNIT – III

Natural Resources – Water resources – Availability and Quality aspects. Water borne diseases, Water induced diseases, Fluoride problem in drinking water, Mineral Resources, Forest Wealth, Material Cycles – Carbon, Nitrogen and Sulphur Cycles

06 Hrs

UNIT – IV

Energy – Different types of energy, Conventional and Non-conventional sources – Hydro Electric, Fossil fuel based, Nuclear, Solar, Biomass and Bio-gas. Hydrogen as an alternative future source of energy.

03 Hrs

UNIT – V

Environmental Pollution and their effects. Water pollution. Land pollution, Noise pollution, Public Health aspects.

03 Hrs.

UNIT – VI

Current Environmental issues of importance: Population Growth, Climate change and Global warming – Effect, Urbanization, Automobile pollution

03 Hrs

UNIT – VII

Acid Rain, Ozone layer depletion, Animal Husbandry

03 Hrs

UNIT – VIII

Environmental protection – Role of Government, Legal aspects, Initiatives by Non-Governmental Organizations (NGO), Environmental Education, Women Education. 02 Hrs

TEXT BOOKS:

Environmental Studies – Benny Joseph – Tata McGraw Hill – 2005

REFERENCE BOOKS:

Principles of Environmental Science & Engineering – P.Venugopala Rao, Prentice Hall of India.

Environmental Science & Engineering – Meenakshi, Prentice Hall of India

CONSTITUTION OF INDIA AND PROFESSIONAL ETHICS

(Mandatory Learning Course)

Course Code: P08HM18/28

Total hours : 26

Hours per week : 02

1. Preamble to the constitution of India. Fundamental rights under part-III- details- of exercise of Rights, Limitations & Important cases. 04 Hrs
2. Relevance of Directive principles of state policy under part-IV. Fundamental duties & their significance. 03 Hrs
3. Union Executive-President, Prime Minister, Parliament 03 Hrs
4. State executive-Governors, Chief Minister, State Legislator and High courts. 03 Hrs
5. Constitutional Provisions for Scheduled Castes & Tribes, Women & Children & Backward classes. Emergency Provisions. 04 Hrs
6. Electoral process, Amendment procedure, 42nd, 44th, 74th, 76th, 86th and 91th constitutional amendments. 03 Hrs
7. Scope & aims of engineering Ethics. Responsibility of Engineers. Impediments to responsibility. 03 Hrs
8. Honesty, Integrity and reliability, risks, safety & liability in engineering. 03 Hrs

Text Books:

Durga Das Basu: "Introduction to the Constitution of India" (students Edn) Prentice-Hall EEE, 19th/20th Edn., 2001.
"Engineering Ethics" by Charles E. Haries, Michael. S. Pritchard and Micheal J. Robins Thompson Asia, 2003-08-05.

Reference Books:

"An introduction to constitution of India" by M.V.Pylee, Vikas publishing, 2002. "Engineeringethic" by M.Govindarajan, S.Natarajan, V.S.Senthilkumar, Prentice-Hall of India Pvt.Ltd. New Delhi, 2004.

KANNADA KALI

(Mandatory Learning Course)

Course Code : P08HM19/29

Total hours : 26

Hours per week : 02

- Lesson 1 : Introducing each other – 1. Personal Pronouns, Possessive forms, Interrogative words.
- Lesson 2 : Introducing each other – 2. Personal Pronouns, Possessive forms, Yes/No Type Interrogation.
- Lesson 3 : About Ramanaya. Possessive forms of nouns, dubitive question, Relative nouns.
- Lesson 4 : Enquiring about a room for rent. Qualitative and quantitative adjectives.
- Lesson 5 : Enquiring about the college. Predicative forms, locative case.
- Lesson 6 : In a hotel. Dative case defective verbs.
- Lesson 7 : Vegetable market. Numeral, plurals.
- Lesson 8 : Planning for a picnic. Imperative, Permissive, hortative.
- Lesson 9 : Conversation between Doctor and the patient. Verb-iru, negation – illa, non – past tense.
- Lesson 10: Doctors advise to Patient. Potential forms, no – past continuous.
- Lesson 11: Discussing about a film. Past tense, negation.

