B.TECH DEGREE COURSE

Scheme of Examinations (2015 admissions)

For Semester I and Semester II, there shall be two streams, A and B
The **stream A** shall comprise of Civil, Electrical and Electronics, Mechanical and Safety and Fire Engineering branches
The **stream B** shall comprise of Computer Science and Engineering, Electronics and Communication and Information Technology branches

SEMESTER I [Stream A]

Code No.	Subject	L Hrs/Wk	T Hrs/Wk	P/D Hrs/ Wk	C	Marks		Total
						CA	ESE	
1101A	Engineering Mathematics –I	3	1	0	3	40	60	100
1102A	Engineering Physics	3	1	0	3	40	60	100
1103A	Engineering Mechanics	4	1	0	4	40	60	100
1104A	Basic Civil Engineering	3	0	0	3	40	60	100
1105A	Basic Mechanical Engineering	3	0	0	3	40	60	100
1106A	Technical Communication and Professional Ethics	2	1	0	2	40	60	100
11L1A	Civil Engineering Workshop	0	0	3	1	50	-	50
11 L2A	Mechanical Engineering Workshop	0	0	3	1	50	-	50
11L3A	Language Lab	0	0	1	1	50	-	50
11L4A	NSS/Nature conservation	0	0	1	1	50	-	50
	TOTAL	**18**	**4**	**8**	**22**			

CA – Continuous Assessment, ESE – End Semester Examination

SEMESTER II [Stream A]

Code No.	Subject	L Hrs/Wk	T Hrs/Wk	P/D Hrs/ Wk	C	Marks		Total
						CA	ESE	
1201A	Computer Programming	3	1	0	3	40	60	100
1202A	Engineering	3	1	0	3	40	60	100

	Chemistry							
1203A	Engineering Graphics	2	1	3	5	40	60	100
1204A	Basic Electrical Engineering	3	0	0	3	40	60	100
1205A	Basic Electronics Engineering	3	0	0	3	40	60	100
1206A	Environmental Studies	3	1	0	3	40	60	100
12L1A	Electrical Engineering Workshop	0	0	3	1	50	-	50
12L2A	Computer Programming Laboratory	0	0	3	1	50	-	50
	TOTAL	**15**	**6**	**9**	**22**			

SEMESTER I [Stream B]

Code No.	Subject	L Hrs/Wk	T Hrs/Wk	P/D Hrs/ Wk	C	Marks		Total
						CA	ESE	
1101B	Computer Programming	3	1	0	3	40	60	100
1102B	Engineering Chemistry	3	1	0	3	40	60	100
1103B	Engineering Graphics	2	1	3	5	40	60	100
1104B	Basic Electrical Engineering	3	0	0	3	40	60	100
1105B	Basic Electronics Engineering	3	0	0	3	40	60	100
1106B	Environmental Studies	3	1	0	3	40	60	100
11L1B	Electrical Engineering Workshop	0	0	3	1	50	-	50
11L2B	Computer Programming Laboratory	0	0	3	1	50	-	50
	TOTAL	**17**	**4**	**9**	**22**			

CA – Continuous Assessment, ESE – End Semester Examination

SEMESTER II [Stream B]

Code No.	Subject	L Hrs/Wk	T Hrs/Wk	P/D Hrs/	C	Marks	Total

				Wk		CA	ESE	
1201B	Engineering Mathematics –I	3	1	0	3	40	60	100
1202B	Engineering Physics	3	1	0	3	40	60	100
1203B	Engineering Mechanics	4	1	0	4	40	60	100
1204B	Basic Civil Engineering	3	0	0	3	40	60	100
1205B	Basic Mechanical Engineering	3	0	0	3	40	60	100
1206B	Technical Communication and Professional Ethics	2	1	0	2	40	60	100
12L1B	Civil Engineering Workshop	0	0	3	1	50	-	50
12L2B	Mechanical Engineering Workshop	0	0	3	1	50	-	50
12L3B	Language Lab	0	0	1	1	50	-	50
12L4B	NSS / Nature conservation	0	0	1	1	50	-	50
	TOTAL	**18**	**4**	**8**	**22**			

1101A / 1201B ENGINEERING MATHEMATICS I

Objectives: To acquire fundamental knowledge and apply in engineering disciplines.
Expected Outcome: After the completion of the course, students would be able to solve curriculum problems.

Module I
Ordinary differential equations:
First order differential equations - exact differential equations, Bernoulli's equations--Methods of solution and Simple applications.

Linear differential equations of higher orders with constant co-efficients-Methods of solution of these equations. Cauchy's linear differential equations. Simultaneous linear differential equations- Simple applications of linear differential equations in engineering problems – Electrical Circuits, Mechanical Systems.

Module II
Infinite series : Integral test, comparison test, ratio test, Cauchy's root test, Raabe's test, seies of positive and negative terms, concept of absolute convergence, alternating series, Leibniz test(No proofs for any of the above tests)

Power series : Taylor and Maclaurin series of functions, Leibniz formula for the nth derivative of the product of two functions (No proof),use of Leibniz formula for the determination of coefficients of the power series.

Module III
Partial differentiation: Partial differentiation-Concept of partial derivative - Chain rule-Total derivative- Euler's theorem for homogeneous functions, Differentials and their applications in errors and approximations, Jacobians - Maxima minima of functions of two variables(Proof of the result not required)-Simple applications.
Co-ordinate systems: Rectangular co-ordinates-Polar co-ordinates-In plane and in Space-Cylindrical polar co-ordinates-Spherical polar co-ordinates.

Module IV
Integral calculus:
Application of definite integrals: Area, Volume, Arc length, Surface area.
Multiple integrals : Evaluation of double integrals-Change of order of integration. Evaluation of triple integrals-Change of Variables in integrals.
Applications of multiple integrals. Plane Area, Surface area &Volumes of solids

References:

1. S.S.Sastry, Engineering Mathematics -Vol1, Prentice Hall India, 2009.
2. Erwin Kreyzig, Advanced Engineering Mathematics, 10th edition, Wiley, 2011.
3. T. Veerarajan, Engineering Mathematics, 3rd Edition, Tata McGraw Hill Publishers, 2011
4. B.S.Grewal, Higher Engineering Mathematics, 43rd Edition, Khanna Publishers, 2013.

Type of Questions for End Semester Exam.
Q 1.Ten short answer questions of 2 marks each with at least 2 questions from each of the four modules. (10x2 = 20 marks)
Q 2. to Q.5 : Two questions A & B of 10 marks from each module with option to answer either A or B.(4 x 10 = 40 marks)

1101B/ 1201A COMPUTER PROGRAMMING

Objectives

To learn the fundamentals of computers
To learn the problem solving techniques writing algorithms and procedures
To learn the syntax and semantics for C programming language
To develop the C code for simple logic
To understand the constructs of structured programming including conditionals and iterations

Expected Outcome

Ability to write algorithms for problems
Knowledge of the syntax and semantics of C programming language
Ability to code a given logic in C language
Knowledge in using C language for solving problems

Module I

Basics of Computer and Information Technology:

Digital Computer System (CPU, Memory, I/O devices)- Working of a digital computer- Hardware and Software : Definition - Categories of Software, Application of Computers – Role of Information Technology – Internet Services

Problem Solving Methodology:

Problem statement, Analysis, Design a solution, Implement/Coding the solution, Test the solution, Design tools (Algorithm, Flow-chart, Pseudo-code)- Develop algorithms for simple problems.

Programming Languages:

Types and generation of programming languages- Compiler – Interpreter-Linker –Loader – Execution of Program

Module II

Basics of C:

Character set-Identifier- Keywords- Constants –Data Types- Variables and declaration – Operators and Expressions – Operator precedence and associativity – Expression Evaluation (Simple Examples) - Input and output functions – Simple computational problems involving the above constructs.

Control Statements:

Selection, Conditional operator, Iteration (for, while, do-while), Branching (switch, break, continue, goto), Nesting of control statements- Problems using control statements.

Module III

Arrays and Strings:

1D and 2D arrays –Searching (Linear and Binary) - Sorting (Bubble, Selection) – Matrix manipulation programs – Strings and basic operations on strings – Strings functions - Programs on string manipulation

Functions:

Definition – Calling – Declaration – Parameter Passing (by value and by reference) – Recursion – Library functions –Programs based on functions

User defined data types:

Structure – Union - Enumerated data type - Programs involving structure and union.

Module IV

Pointers:
Declaration, Initialization – Pointers and arrays – Pointers and structures – Pointers and functions – Command line arguments – Dynamic memory allocation – Operations on pointers – Programs involving the above concepts

Files:
File concept – File pointer – File handling operations (open, close, read, write etc) on sequential and random access files. Programs on file manipulations using fgetc(), fgets), fseek.

References:

1. Pradip Dey and Manas Ghosh, Computer Fundamentals and Programming in C, Second Edition, Oxford University Press, 2013.
2. Smarajit Ghosh, All of C, PHI Learning Pvt. Ltd, 2009.
3. Byron Gottfried, Programming with C, 2nd edition, Tata McGraw-Hill, 2006.
4. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Second Edition, Pearson Education, 2001.
5. R.G. Dromey, How to solve it by Computer, Pearson Education, 2008.
6. Sukhendu Dey, Debobrata Dutta, Complete Knowledge in C, Narosa Publishing House, New Delhi, 2009.
7. Kanetkar Y, Let Us C, BPB Publications, 2007
8. Varghese Paul, Computer Fundamentals, Second Edition, Educational Publishers & Distributers, Ernakulam, 2007.
9. Jose Surendran, Introduction to Computer Programming in C, Pentagon Educational Services, Kollam, 2013.

Type of Questions for End Semester Exam.
Q 1.Ten short answer questions of 2 marks each with at least 2 questions from each of the four modules. (10x2 = 20 marks)
Q 2. to Q.5 : Two questions A & B of 10 marks from each module with option to answer either A or B.(4 x 10 = 40 marks)

1102A / 1202B ENGINEERING PHYSICS

Objectives

To make a bridge between the physics in school and engineering courses.

To introduce the basic concepts of modern science like Photonics, Engineering applications of acoustics, fundamentals of crystal physics and materials science.

Expected Outcome

The student will be able to understand many modern devices and technologies based on lasers and optical fibers. Student can also appreciate various material properties which are used in engineering applications and devices.

Module 1

Laser-introduction--spontaneous and stimulated emission-principle of laser- properties of laser-Einstein coefficients and the analysis of lasing conditions- Basic components of a laser-Different types of lasers- construction,working and applications of Ruby laser-Neodymium YAG laser- He-Ne laser- semiconductor laser-Applications of laser in medicine, industry, science and communication.

Holography-basic principle-Comparison with ordinary photography-Recording and reconstruction of holograms-applications.

Fibre optics - Basic structure of an optical fibre - step-index fibre and graded index fibre-propagation of light in an optical fibre-acceptance angle and acceptance cone- Numerical aperture of a step-index fibre-Numerical aperture of a graded index fibre-modes of propagation-step index monomode fibre-Multimode stepindex fibre- Graded multimode fibre-Attenuation in optic fibres-fibre losses-material loss,scattering loss,absorption loss,leaky modes- dispersion in optical fibres- Applications.

Module II

Crystallography – Space lattice- Basis- Unit cell- Unit cell parameters- Crystal systems-Bravais lattices-Three cubic lattices-sc, bcc, and fcc- Number of atoms per unit cell- Co-ordination number- Atomic radius-Packing factor- Relation between density and crystal lattice constants- Lattice planes and Miller indices-Separation between lattice planes in sc-Bragg's law- Bragg's x-ray spectrometer- Crystal structure analysis.

Liquid crystals- Liquid crystals, display systems-merits and demerits- Metallic glasses-Types of metallic glasses (Metal-metalloid glasses, Metal-metal glasses) – Properties of metallic glasses (Structural, electrical,magnetic and chemical properties).

Shape memory alloys- Shape memory effect, pseudo elasticity

Module III

Introduction to nanoscale science and technology- nanostructures-nanoring, nanorod, nanoparticle,

nanoshells- Properties of nanoparticles- optical, electrical, magnetic, mechanical properties and quantum confinement- Classification of nanomaterials- C60, metallic nanocomposites and polymer nanocomposites-Applications of nanotechnology.

Superconductivity-Introduction--transition temperature-Meissner effect-properties of super conductors.Types of superconductors-type 1 and type 2- AC Josephsons effect- DC Jospehsons effect- Flux quantisation-Squid-High temperature superconductors-Applications of super conductivity.

Special Theory of Relativity - Michelson-Morley experiment. Einstein's postulates. Lorentz transformation equations (no derivation). Simultaneity. Length contraction. Time dilation. Velocity addition. Relativistic mass. Mass energy relation. Mass less particle.

Module IV

Quantum mechanics-Introduction-origin of quantum theory-black body radiation and photo electric effect (brief ideas only)-matter waves- wave packet-uncertainty principle-(two

forms)Time dependent Shrodinger equation for a free particle-Particle in force field and time dependent Schrodinger equation-Time independent schrodinger equation-Physical intrepretation of wave function-application -Particle in a Box (one dimensional) –Energy eigen values and wave functions **Ultrasonics**-piezo electric effect-Magnetostriction effect-production of ultrasonics-properties of ultrasonics- ultrasonic diffractometer and determination of velocity of ultrasonics in a liquid-Application of ultrasonics in non destructive testing - Accoustics of building-reverberation- Absorption Coefficient- Sabines formula for reverberation time(Derivation)-Accoustic intensity- loudness-decibel-phon-conditions for good acoustics(Qualitative study).

References:

1. S. Mani Naidu, A Text book of Engineering Physics, Pearson, 2010
2. A.S. Vasudeva, Modern Engineering Physics, S. Chand & Co, 2013.
3. Prabir K. Vasu and Hrishikesh Dhasmana, Engineering Physics, Ane books Pvt. Ltd., 2010.
4. S.O. Pillai & Sivakami, Applied Physics, New Age International (P) Ltd., Second Edition, 2008.
5. G.S. Raghuvanshi, Engineering Physics, Prentice Hall of India, 2008.
6. M.C. Santosh Kumar, Engineering Physics, Nalpat Publishers, 2012.
7. B. Premlet, Advanced Engineering Physics, Phasor Books, Kollam, 2013.

Type of Questions for End Semester Exam.

Q 1.Ten short answer questions of 2 marks each with at least 2 questions from each of the four modules. (10x2 = 20 marks)

Q 2. to Q.5 : Two questions A & B of 10 marks from each module with option to answer either A or B.(4 x 10 = 40 marks)

1102B / 1202A ENGINEERING CHEMISTRY

Objectives
To introduce the students to basic principles of solid state chemistry, electrochemistry, spectroscopy, corrosion, chemical kinetics, phase equilibrium and engineering materials of importance.

Expected Outcome
Students would have learnt the significance of electrochemistry and its application, corrosion, chemical kinetics, engineering materials of importance and polymer.

Module I
Solid state chemistry: Fundamentals, Bonding in solids, Born-Haber cycle, Point defects, Methods to improve reactivity of solids, Free electron theory, Band theory, Fermi level in semiconductors, Molecular field theory of magnetic materials.
Spectroscopy: Molecular energy levels-Types of molecular spectra- Electronic spectra (Classification of electronic transitions- Beer Lamberts law, Vibrational spectra (mechanism of interaction and application), Rotational spectra (Determination of bond length and application). NMR spectra (Basic principle, chemical shift, spin-spin splitting)
Solid surface characterisation: Electron spectroscopy for chemical analysis, Chemical shift, BET isotherm, Thermodynamics of adsorption.

Module II
Electrochemistry: Fundamentals, Electrode potential, Nernst's equation, Types of electrodes, Salt bridge, E.M.F measurement. Concentration cells, Calculation of E.M.F of a concentration cell.
Acids and bases, Arrhenius concept, Bronsted-Lowry concept of acids and bases, Lewis concept, Buffer solutions, pH measurement, Polarisation, Overvoltage.
Power generation: Secondary cells, Fuel cells, Photovoltaic effect, Solar cells.
Corrosion and its control: Theories of corrosion - Galvanic series- Types of corrosion - Factors affecting corrosion and different methods of corrosion control.
Chemical Kinetics: reaction rate, rate constant, rate law, reaction order, first order, second order, pseudo-first order reactions, integrated rate laws, half-life of a reaction and its relation to rate constant. Molecularity, simple unimolecular and bimolecular reactions. Arrhenius equation.

Module III
Chemical Thermodynamics: Fundamentals, Molecular interpretation of internal energy, enthalpy and entropy, Heat of reaction, Kirchhof's equation, Trouton's rule, Entropy changes accompanying different processes, Nernst heat theorem, Third-law.
Free energy: Dependence on pressure and temperature, Gibbs-Helmholtz equation, Free energy changes and equilibrium constant, chemical potential, Fugacity, Thermodynamics of biochemical reactions.
Phase Rule: Terms involved in phase rule and examples, Application of phase rule to one component water system, Application of phase rule to two-component systems.

Module IV
Engineering materials:
Polymers- Classifications- Mechanism of polymerisation (Addition, free radical, cationic, anionic and coordination polymerisation)- Thermoplastics and thermosetting plastics- Compounding of plastics-Moulding techniques of plastics (Compression, Injection, Transfer and Extrusion moulding)-Preparation, properties and uses of PVC, PVA, Nylon, PET -

Silicon polymers- Biodegradable plastics. Elastomers- structure of natural rubber- vulcanisation- synthetic rubbers (Buna-S, Butyl rubber and Neoprene).
Lubricants- Introduction-Mechanism of lubrication- solid and liquid lubricant- Properties of lubricants-Viscosity index- flash and fire point- cloud and pour point- aniline value.
Refractories: Classification – Properties of refractories.
Cement- Manufacture of Portland cement- Theory of setting and hardening of cement.

References:

1. Peter Atkins, Julio de Paula, Elements of Physical Chemistry, Oxford University Press, 2005.
2. John E. McMurry and Robert C. Fay, Chemistry, 5th Edition, Pearson, 2008.
3. O. G Palanna, Engineering Chemistry, Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2009.
4. R.N. Goyal, Harmendra Goel, Textbook of Engineering Chemistry, 2nd Edition, Ane Books Pvt. Ltd., 2011.
5. R Gopalan, D Venkappayya, Sulochana Nagarajan, Textbook of Engineering Chemistry, 2nd Edition, Vikas Publishing House Pvt. Ltd., New Delhi, 2005.
6. Shashi Chawla, A Text Book of Engineering Chemistry, Dhanpat Rai & Co, New Delhi, 2003.
7. Kochubaby Manjooran, Modern Engineering Chemistry, Kannantheri Publication, Kochi, 2012.

Type of Questions for End Semester Exam.

Q 1.Ten short answer questions of 2 marks each with at least 2 questions from each of the four modules. (10x2 = 20 marks)

Q 2. to Q.5 : Two questions A & B of 10 marks from each module with option to answer either A or B.(4 x 10 = 40 marks)

1103A / 1203B ENGINEERING MECHANICS

Objectives

1. To introduce mechanics as a common subject to all branches of engineering and oriented towards engineering applications.
2. To inculcate the ability of formulating, analysing and solving an engineering problem through the application of the principles of mechanics.
3. To discuss the subject content as a foundation course for many follower courses distributed in various engineering disciplines.
4. To eradicate an expected fearful approach of a student towards the study of mechanics and to encourage him/her to pursue further in follower courses in mechanics.
5. To directly introduce the importance and concept of the quantities, like, centroid, moment of inertia, relative velocity and acceleration, projectile motion, equilibrium equations, etc., in nearly all disciplines of engineering.

Expected Outcome

The terminal objectives of the course is that, on successful completion of teaching-learning and evaluation activities, a student would be able to identify and analyse the problems by applying the fundamental principles of engineering mechanics and to proceed to research, design and development of engineering systems.

A) STATICS

Module I

Introduction to Mechanics: Definition of mechanics, classification of mechanics – rigid body and deformable body mechanics, division of rigid body mechanics – statics and dynamics, Applications of mechanics in engineering practice.

Forces and Force systems: Force and its characteristics, Principles of statics – concept of resultant and equilibrant, Composition and resolution of forces, force systems.

Coplanar Concurrent force system: Equilibrium – two forces, three and more than three forces, concept of moment of a force, equations of equilibrium, Friction and its effects on bodies, Solutions of problems involving equilibrium of coplanar concurrent forces.

Coplanar Parallel force System: Two parallel forces, General case of parallel forces in a plane, Centre of parallel forces, Centre of gravity, Centre of mass, Centroids of curves, areas and volumes – regular and composite, Pappus's theorems, Equilibrium of distributed forces in a plane, Applications of the concept of centroid in engineering practice.

Module II

Moment of Inertia: Concept of moment of inertia and second moment of area, Mass moment of inertia of regular and composite solids, Second moment of area of regular and composite surfaces, Polar moment of inertia / second moment of area, Product of inertia, Principal moments of inertia and principal axes, Applications of the concepts in engineering practice.

Coplanar non-concurrent force system: Resultant of a general case of force system in a plane, Equilibrium equations, Applications in engineering practice.

Analysis of Plane trusses and frames: Concept of load carrying mechanism in trusses and frames – internal (axial) forces, two force and multi force members, Analysis of plane trusses by Method of joints and Method of sections, Analysis of Plane frames by Method of members, Applications of trusses and frames in structures.

Principle of virtual work: Concept of virtual work and the principle of virtual work, Applications in engineering, Equilibrium of ideal systems, Stable and unstable equilibrium.

B) DYNAMICS

Module III

Introduction to Dynamics: Definitions, Units, Divisions – Kinematics, Kinetics.

Rectilinear translation: Kinematics of rectilinear motion – displacement, velocity, acceleration, Kinetics – Differential equation of rectilinear motion, Motion of a particle due to a constant force, Motion of a particle due to a force proportional to displacement – Simple harmonic motion. The D'Alembert's principle in rectilinear translation and its applications, Momentum and impulse, Work and energy, Ideal systems, Conservation of energy, Collision of two bodies – direct central impact.

Module IV

Curvilinear translation: Kinematics of curvilinear translation – components of displacement, velocity and acceleration, normal and tangential acceleration, Kinetics – Differential equations of motion, Motion of a projectile – projection on horizontal and inclined surfaces, D'Alembert's principle in curvilinear motion and its applications, Moment of momentum, Work and energy in curvilinear motion.

Rotation of a rigid body: Kinematics of rotation – angular displacement, velocity and acceleration, rpm, Relations of kinematic parameters of linear and angular motions, Kinetics – Equation of motion of a rigid body rotating about a fixed axis, Rotation under the action of a constant moment, Rotation proportional to angular displacement – Compound pendulum, D'Alemberts principle in rotation, Resultant inertia force in rotation, Principle of angular momentum in rotation, Energy equation for rotating bodies.

REFERENCE

1. Timoshenko and Young, Engineering Mechanics, McGraw Hill Book Company, Singapore, 1956.
2. Beer F. P. and Johnston E. R, Mechanics for Engineers (Vol. 1- Statics and Vol.2 - Dynamics), Tata McGraw Hill, 2004.
3. Merriam H. L. & Kraige L. G, Engineering Mechanics (Vol. 1- Statics and Vol.2 - Dynamics), John Wiley and Sons, 2003.
4. Rajasekaran.S, Sankarasubramanian.G., Fundamentals of Engineering Mechanics, 3rd Edition, Vikas Publishing House Pvt. Ltd.,2010.
5. Hibbeller, R.C., Engineering Mechanics, Vol. 1 Statics, Vol. 2 Dynamics, 12th Edition, Pearson Education Asia Pvt. Ltd.,2010.
6. Biju N, Engineering Mechanics, Educational Publishers & Distributors, 2014.

Type of Questions for End Semester Exam.

Q 1.Ten short answer questions of 2 marks each with at least 2 questions from each of the four modules. (10x2 = 20 marks)

Q 2. to Q.5 : Two questions A & B of 10 marks from each module with option to answer either A or B.(4 x 10 = 40 marks)

1103B/ 1203A ENGINEERING GRAPHICS

Objectives

Irrespective of engineering discipline, it has become mandatory to know the **basics of Engineering graphics.** The student is expected to possess the efficient drafting skill depending on the operational function in order to perform day to day activity.
Provide neat structure of industrial drawing
Enables the knowledge about position of the component and its forms
Interpretation of technical graphics assemblies
Preparation of machine components and related parts

Expected Outcome

Towards the end of the course it is expected that the students would be matured to visualize the engineering components. A number of chosen problems will be solved to illustrate the concepts clearly.

Module I

Introduction to engineering graphics. Drawing instruments and their use. familiarisation with current Indian Standard Code of Practice for general engineering drawing.
Scales- plain scale ,vernier scale, diagonal scale.
Conic sections- Construction of ellipse, parabola, hyperbola - construction of cycloid, involute, archimedian spiral and logarithmic spiral- drawing tangents and normals to these curves.

Module II

Introduction to orthographic projections- plane of projection- principles of first angle and third angle projections, projection of points in different quadrants.
Orthographic projection of straight lines parallel to one plane and inclined to the other plane- straight lines inclined to both the planes- true length and inclination of lines with reference planes- traces of lines.
Projection of plane laminae of geometrical shapes in oblique positions.

Module III

Projection of polyhedra and solids of revolution- frustum, projection of solids with axis parallel to one plane and parallel or perpendicular to other plane- projection of solids with axis inclined to both the planes- projection of solids on auxiliary planes.
Section of solids by planes inclined to horizontal or vertical planes- true shape of sections.

Module IV

Development of surface of cubes, prisms, cylinders, pyramids and cones
Intersection of surfaces- methods of determining lines of intersection - intersection of prism in prism and cylinder in cylinder.

Module V

Introduction to isometric projection- isometric scales, isometric views- isometric projections of prisms, pyramids, cylinders, cones and spheres.
Introduction to perspective projections : visual ray method and vanishing point method- perspective of circles- perspective views of prisms and pyramids.

References:

1. K.C. John. Engineering Graphics, PHI Learning, 2013.
2. N.D.Bhat , Elementary Engineering Drawing, 49th Edition, Charotar publishing House, 2010.
3. P.S.Gill , Geometric Drawing, B.D Kataria &Sons, Ludhiana, 2012.
4. P I Varghese, Engineering Graphics, VIP Publishers, 2013.

End Semester Examination Question Paper pattern

Two questions of 12 marks each from all the five modules. Answer one question from each module. (5x12 = 60 marks)

1104A / 1204B BASIC CIVIL ENGINEERING

Objectives

1. To give an overview of the fundamentals of the Civil Engineering fields to the students of all branches of Engineering
2. To realize the importance of the Civil Engineering Profession in fulfilling societal needs

Expected Outcome

1. The students will gain knowledge on site selection, construction materials, and components of buildings.
2. A basic appreciation of multidisciplinary approach when involved in Civil Related Projects.

MODULE I

Engineering Materials: Cement - varieties and grade of cement and its uses. Cement mortar- Steel- types of steel for reinforcement bars, steel structural sections. Brick- varieties and strength, tests on bricks.

Aggregates- types & requirements. Concrete- grades of concrete as per IS code, water cement ratio, workability, mixing, batching, placing, compaction and curing.

MODULE-II

Construction : Foundation- types of foundations- isolated footing, combined footing, raft, pile & well foundations- Foundation for Machinery

Super structure: Brick masonry, English bond and Flemish bond, Stone masonry-Ashlar masonry- Rubble masonry. Roofing- Steel trusses, roofing for industrial buildings

MODULE-III

Surveying: Principles, instruments, ranging and chaining of survey lines, field work, field book, reconnaissance. Selection of survey stations,

Leveling: Leveling instruments, different types, temporary adjustments, reduced level of point, booking of field notes, and reduction of levels by height of collimation method.

MODULE-IV n

Site planning and Building Rules-Selection of site-Site plan preparation for buildings-Kerala Municipal Building Rules (1999)-general provisions regarding site and building requirements-Coverage and Floor Area Ratio-Basic concepts of Intelligent Buildings and Green Buildings

Roads- Classification of Rural and urban Roads.

Sources of Water - Water Supply- Quality of Water.

REFERENCES

1. S.C. Rangawala, Engineering Materials, 41st Edition, Charotar Publishing House, Anand, 2014.
2. Surendra Singh, Building Materials, Vikas Publishing Company, New Delhi, 1996.
3. S.C. Rangawala, Building Construction, 32nd Edition, Charotar Publishing House, Anand, 2014.
4. P. Kanetkar, Surveying and Levelling, Volumes 1 and 2, United Book Corporation, Poona, 1994.
5. Kerala Municipal Building Rules-1999
6. Punmia, B.C, Ashok Kumar Jain, Arun Kumar Jain, Basic Civil Engineering, Laxmi Publishers, 2012.
7. Roy M. Thomas, Fundamentals of Civil Engineering, Educational Publishers & Distributors, Ernakulam, 2012.

Type of Questions for End Semester Exam.

Q 1.Ten short answer questions of 2 marks each with at least 2 questions from each of the four modules. (10x2 = 20 marks)

Q 2. to Q.5 : Two questions A & B of 10 marks from each module with option to answer either A or B.(4 x 10 = 40 marks)

1104B/1204A BASIC ELECTRICAL ENGINEERING

Objectives
To impart a basic knowledge in Electrical Engineering with an understanding of fundamental concepts.

Expected outcome
The course will enable the students to gain preliminary knowledge in basic concepts of Electrical Engineering.

Module I
Basic principles of Electric circuits: Review of Ohm's law - Definition of Resistance, Current, Voltage and Power - Series and Parallel circuits- Constant voltage source and Constant current source.
Network Theorems: Kirchhoff's laws- Network analysis by Maxwell's circulation currents - Superposition theorem -Thevenin's theorem - Norton's theorem - simple illustrative problems on network theorems.
Review of electrostatics - Coulomb's Law- Electric field strength and electric flux density, Capacitance.

Module II
Review of electromagnetic induction -Faraday's Law- Lenz's Law - Mutually induced emf. Magnetic circuits - Magnetic field of a coil - Ampere turns calculation - Magnetic flux - Flux density - Field strength.
Measuring instruments: Working principle of galvanometer, Ammeter, Voltmeter, Watt meter & Energy Meter (elementary concepts).

Module III
AC Fundamentals: Sinusoidal Alternating Waveforms - Sinusoidal AC Voltage characteristics and definitions – Frequency spectrum– General format for the sinusoidal voltage of current – Phase Relations – Average value – Effective (Root mean square) value.
The Basic Elements and Phasors: Response of basic R,L and C elements to a sinusoidal voltage or current – Frequency response of the basic elements – Average power and power factor – complex numbers – Rectangular form – Polar form – Conversion between forms.
Series and Parallel ac Circuits: Impedance and the Phasor Diagram- series configuration – voltage divider rule –frequency response for series ac circuits –Admittance and susceptance – parallel ac networks – current divider rule – frequency response of parallel elements.
Introduction to 3 phase Systems: Star- Delta connection

Module IV
Electrical Machines: Principle of operation, Types and applications of DC machines, Transformers and Induction Machines. (Only an elementary qualitative treatment is envisaged.)
Elementary Concepts of Generation, Transmission, and Distribution: Various levels of power transmission – conventional sources of electrical energy, Hydro, Thermal, Nuclear and Diesel power station - introduction to primary and secondary distribution

REFERENCES
1. Boylestad, Introductory Circuit analysis, 12th Edition, Pearson Education, 2012.
2. H. Cotton, Electrical Technology, 7th Edition, CBS Publishers and Distributors, 2005.

3. Leonard S. Bobrow, Fundamentals of Electrical Engineering, Oxford University Press, 1996.
4. Rajendra Prasad, Fundamentals of Electrical Engineering, 2nd Edn, PHI Learning, 2009
5. Edward Hughes, Electrical Technology, Addison Wesley Longman, 1995.

Type of Questions for End Semester Exam.

Q 1.Ten short answer questions of 2 marks each with at least 2 questions from each of the four modules. (10x2 = 20 marks)

Q 2. to Q.5 : Two questions A & B of 10 marks from each module with option to answer either A or B.(4 x 10 = 40 marks)

1105A/1205B BASIC MECHANICAL ENGINEERING

Objectives

1. To give an overview of the fundamentals of the Mechanical Engineering fields to the students of all branches of Engineering
2. To realize the importance of the Mechanical Engineering Profession in fulfilling societal needs

Outcome:

The terminal objectives of the course is that, on successful completion of teaching-learning and evaluation activities, a student would be able to identify, appreciate and analyze the problems by applying the fundamentals of mechanical engineering and to proceed for the development of the mechanical systems.

Module 1

Thermodynamics: Thermodynamics systems – open, closed and isolated systems, equilibrium state of a system, property and state, process, cycle, Zeroth law of thermodynamics- concept of temperature, temperature scales. First law – internal energy, enthalpy, work and heat, Different processes, isobaric, isochoric, isothermal and adiabatic processes. Second law – Kelvin-plank and Claussius statements, Carnot Cycle. Simple problems only.

Properties of Steam & Steam Generator. Different types of boilers, boiler mountings and accessories. Formation of steam at constant pressure, Thermodynamic properties of Steam, working of steam turbines, compounding of turbines.

Module 2

Internal Combustion Engines: Air standard cycles – Otto and Diesel cycles, working of two stroke and four stroke Petrol and Diesel engines, Carburatted and MPFI engines, fuel pump, fuel injector, ignition system, cooling system, lubricating system.

Refrigeration & Airconditioning: Introduction to refrigeration and air -conditioning, Rating of refrigeration machines, Coefficient of performance, Simple refrigeration vapour compression cycle, summer and winter air conditioning.

Module 3

Hydraulic Turbines & Pumps : Introduction, Classification, Construction details and working of Pelton, Francis and Kaplan turbines, Specific speed and selection of turbines, Classification of water pumps, working of centrifugal pumps and reciprocating pumps (elementary ideas only)

Power plants: Hydro-electric power plants, Thermal power plants, Nuclear power plants, Diesel power plants, Wind mills, solar energy (Schematic representations only)

Industrial Engineering: Definition and history of Industrial Engg, contributions of F W Taylor, Henry Foyal, Gilberth, and Henry Gannt towards Industrial Engineering, basic concepts of time and motion study, productivity, organizational performance, pricing, and depreciation.

Module 4

Introduction to Manufacturing Systems: Welding- different types of welding, resistance welding, arec welding, gas welding, Brazing and soldering. Different welding defects. Casting- different casting processes, sand casting, casting defects, Rolling- hot rolling and cold rolling, two high, three high , cluster rolling mills, wire drawing, forging, extrusion, Heat treatment of steel, elementary ideas of annealing, hardening, normalizing, surface hardening.

Power Transmission Methods and Devices: Introduction to Power transmission, Belt, Rope, Chain and Gear drive. Length of belt open and crossed. Ratio of belt tensions. Different types of gears (elementary ideas only). Types and functioning of clutches.

References

1. Nag P.K, Engineering Thermodynamics, Fifth Edition, McGraw Hill Education (India) Pvt. Ltd, 2013.
2. J.P. Holman, Thermodynamics, 3rd Edition, Mc Graw Hill, 1995.
3. Rogowsky, Elements of Internal Combustion Engines, Tata McGraw Hill, 1986.
4. Gill J.H, Smith Jr, and E J Ziurys, Fundamentals of Internal Combustion Engines, Oxford & IBH, 1959.
5. Stoecker W F, Refrigeration and Air Conditioning, Tata McGraw Hill, 1980.
6. V Raghavan, Material Science and Engineering, Prentice Hall of India, 2004.
7. Jagadish Lal, Hydraulic Machines, Metropolitan Book co, New Delhi, 1994.
8. Rajendar Singh, Introduction to Basic Manufacturing Processes and Workshop Technology, New Age International, 2006.
9. S. Dalela, Mansoor Ali, Industrial Engineering and Management, Standard Publishers & Distributors, 2010.

Type of Questions for End Semester Exam.

Q 1.Ten short answer questions of 2 marks each with at least 2 questions from each of the four modules. (10x2 = 20 marks)

Q 2. to Q.5 : Two questions A & B of 10 marks from each module with option to answer either A or B.(4 x 10 = 40 marks)

1105B/1205A BASIC ELECTRONICS ENGINEERING

Course Objectives

1. To get basic idea about types, specification and common values of passive components.
2. To familiarize the working and characteristics of diodes, transistors, and some measuring instruments.
3. To understand working of diodes in circuits and in rectifiers.

Expected outcome

Student can identify the active and passive electronic components. Student can setup simple circuits using diodes and transistors. Student will get fundamental idea about basic communication systems and entertainment electronics

Module I

Semiconductor Physics: Basic concepts, Intrinsic and extrinsic semiconductors, diffusion and drift currents, p-n junction under open-circuit, reverse bias and forward-bias conditions, p-n junction in the breakdown region,

The Diode - Biasing the Diode, Voltage - Current Characteristic of a Diode, Diode Models, **Diode Applications -** Half Wave and Full Wave Rectifiers, Power supply Filters and Regulators, **Special Purpose Diodes -** Zener Diodes- Applications, Varactor Diodes, Optical Diodes-Other Types of Diodes. **Bipolar Junction Transistors (BJTs) -** Transistor Structure - Basic Transistor Operation, Transistor characteristics and parameters, Transistor as an Amplifier, Transistor as a Switch.

Module II

Amplifiers: Introduction of different types of amplifiers and their characteristics, Principle of amplification.

Oscillators: Criteria for oscillations, Qualitative analysis of LC, RC and Crystal Oscillators.

Power Supplies: Introduction and Working of Switched Mode Power Supply (SMPS), Voltage Regulator, Introduction to Inverters and UPS.

Module III

Digital Electronics: Binary, Octal and Hexadecimal number systems and conversions, Boolean Algebra, Truth tables of logic gates (AND, OR, NOT), NAND, NOR as universal gates, Difference between combinational circuits and sequential circuits. **Introduction to microprocessors:** classification, architecture, instructions, computer organization. **Sensors-** Temperature, light, force and sound sensors; **Actuators** – Heat, Light, force and sound actuators. **Electronic measurements** - measurements of voltages and currents, voltmeter, ammeter, multimeter, CRO (Block level treatment only)

Module IV

Introduction to signal processing: Signals and Systems- classification-properties, Sampling & quantization, transforms, spectrum, filters.

Introduction to Electronic Communication systems: Modulation and Demodulation, Analog communication system, Electromagnetic frequency spectrum, Bandwidth and information capacity, Principles of Amplitude and angle modulation, Bandwidth requirements of angle modulated waves.

References:

1. Thomas L. Floyd, Electronic Devices, 7th Edition, Pearson Education Inc., 2008.
2. Neil Storey, Electronics: A Systems approach, Pearson Education Inc. 2011

3. Wayne Tomasi, Electronic Communication Systems: Fundamentals through Advanced, 5th Edition, Pearson Education Inc., 2009.
4. Tocci R J and Widmer N S, Digital Systems – Principles and Applications, 8th Edition., Pearson Education India, New Delhi, 2001.
5. James H. McClellan, Ronald W. Schafer, Mark A. Yoder, Signal Processing First, Pearson Education, 2003.

Type of Questions for End Semester Exam.

Q 1.Ten short answer questions of 2 marks each with at least 2 questions from each of the four modules. (10x2 = 20 marks)

Q 2. to Q.5 : Two questions A & B of 10 marks from each module with option to answer either A or B.(4 x 10 = 40 marks)

1106A/1206B ENVIRONMENTAL STUDIES

Objective

To make the student aware of the need for sustainable development.

To familiarize the student with the various problems facing the environment like pollution, loss of habitat, solid waste disposal, degradation of environment, over use of resources, global warming, the depletion of ozone layer and loss of biodiversity

Expected Outcome

On successful completion of the teaching-learning and evaluation activities, a student would be able to identify, appreciate and analyze the various issues threatening the environment. It would also create a pro-environmental attitude and a behavioral pattern in the student that is based on sustainable lifestyles.

Module I

Multidisciplinary nature of environmental studies. Definition, scope and importance, need for public awareness.

Natural Resources : Renewable and non-renewable resources : Natural resources and associated problems. a) Forest resources : Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people.

b) Water resources : Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.

c) Mineral resources : Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

d) Food resources : World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

e) Energy resources : Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies.

f) Land resources : Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

Module II

Ecosystems: Concept of an ecosystem. Structure and function of an ecosystem. Producers, consumers and decomposers. Energy flow in the ecosystem. Ecological succession. Food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the following ecosystems :- a. Forest ecosystem b. Grassland ecosystem c. Desert ecosystem d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Biodiversity and its conservation: Introduction – Definition : genetic, species and ecosystem diversity. Biogeographical classification of India. Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values. Biodiversity at global, National and local levels. Inida as a mega-diversity nation. Hot-sports of biodiversity. Threats to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India. Conservation of biodiversity : In-situ and Ex-situ conservation of biodiversity.

Module III

Environmental Pollution: Definition. Cause, effects and control measures of :- a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards. Solid waste Management : Causes, effects and control measures

of urban and industrial wastes. Role of an individual in prevention of pollution. Pollution case studies.

Diaster management : floods, earthquake, cyclone and landslides.

Environmental legislation: Environment Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. Issues involved in enforcement of environmental legislation.

Module IV

Environmental ethics : Issues and possible solutions. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies. Wasteland reclamation. Consumerism and waste products.

Social Issues and the Environment: From Unsustainable to Sustainable development. Urban problems related to energy. Water conservation, rain water harvesting, watershed management. Resettlement and rahabilitation of people; its problems and concerns. Case Studies. Public awareness.

Human Population and the Environment: Population growth, variation among nations. Population explosion – Family Welfare Programme. Environment and human health. Human Rights. Value Education. HIV/AIDS. Women and Child Welfare. Role of Information Technology in Environment and human health. Case Studies.

Field work: Visit to a local area to document environmental assets river/ forest/grassland/hill/mountains. Visit to a local polluted site- Urban/Rural/Industrial/Agricultural. Study of common plants, insects, birds. Study of simple ecosystems-pond, river, hill slopes, etc.

References:

1. Rajagopalan. R, Environmental Studies: From Crisis to Cure, Oxford University Press, 2005
2. Erach Bharucha, Textbook of Environmental Studies and Ethics, Universities Press (India), Hyderabad, 2005.
3. Jayashree A. Parikh, V.M. Balsaraf, P.B. Dwivedi, Environmental Studies, Ane Books Pvt. Ltd., 2010.
4. Anindita Basak, Environmental Studies, Pearson, 2009.
5. Gouri Suresh, Environmental Studies and Ethics, I.K. International Publishing House Pvt. Ltd., New Delhi, 2007.
6. S.P. Misra, Essential Environmental Studies, 3rd Edition, Ane Books Pvt. Ltd., 2011.
7. Benny Joseph, Environmental Science & Engineering, Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2010.
8. Meenambal T , Uma R M and K Murali, Principles of Environmental Science and Engineering, S. Chand & Company Ltd, 2005

Type of Questions for End Semester Exam.

Q 1.Ten short answer questions of 2 marks each with at least 2 questions from each of the four modules. (10x2 = 20 marks)

Q 2. to Q.5 : Two questions A & B of 10 marks from each module with option to answer either A or B.(4 x 10 = 40 marks)

1106B/ 1206A TECHNICAL COMMUNICATION & PROFESSIONAL ETHICS

Objectives

The primary objective is to develop in the under-graduate students of engineering a level of competence in English required for independent and effective communication for their professional needs. It is also intended to develop awareness about the role of ethics in the practice of engineering profession.

Expected Outcome

The students will have knowledge of the various uses of English in their professional environment and they will be able to communicate themselves effectively in their chosen profession. The students will also have knowledge about the ethical principles of engineering profession.

Module I

Remedial Grammar :Errors of Accidence and syntax with reference to Parts of Speech; Agreement of Subject and Verb; Tense and Concord; Conditional Clauses; Use of connectives in Complex and Compound sentences; Question tags and short responses. Word Formations (by adding suffixes and prefixes); Technical Word Formation; Synonyms, Antonyms, Homophones, and Homonyms; One Word Substitution; Misappropriations; Indianisms; Redundant Words; Phrasal Verb Idioms.

Elementary Phonetics (Speech Mechanism, The Description of Speech Sounds, The Phoneme, the syllable; Prosodic Features, Word Accent, Features of Connected Speech); Paralanguage and Body language; and Classroom Presentations, Hearing and Listening; Essentials of Good Listening: Achieving ability to comprehend material delivered at relatively fast speed.

Module II

Oral Communication: Starting and ending a conversation; telling and asking people to do things; expressing opinions and ideas, decisions and intentions, offers and invitations, feelings, right and wrong, numbers and money.

Purpose and audience; dealing with customers and clients; face-to-face discussions; meetings and attending meetings; checking understanding; raising questions; giving and receiving feedback; using body language; leading and directing discussions; concluding discussions; using graphics in oral presentations

Group Discussion: Use of persuasive strategies including some rhetorical devices for emphasizing (for instance; being polite and firm; handling questions and taking in criticism of self; turn-taking strategies and effective intervention; use of body language).

Reading Comprehension and reference skills: Skimming and scanning; factual and inferential comprehension; prediction; guessing meaning of words from context; word reference; comprehending graphics in technical writing.

Reading strategies; reading speed; reading between the lines for hidden meaning; interpreting graphics; using a dictionary; using an index; using a contents list to find information; choosing the right reference source.

Module III

Written Communication: note making and note taking; summarising; notes and memos; developing notes into text; organisation of ideas: cohesion and coherence; paragraph writing: ordering information in space and time; short essays: description and argument; comparison and contrast; illustration; using graphics in writing: tables and charts; diagrams and flow-charts; maps, plans and graphs.

Spelling rules and tips; writing a rough draft; editing and proof reading; writing the final draft; styling text; filling in complex forms; standard letters; CV; writing a report; writing leaflets and brochures; writing references; essay writing:expository writing; description of processes and products; classification; the instructional process; arguments and presentation of arguments; narrating events chronologically.

(Emphasis should be given to the practice sessions for developing the oral and written communication skills of students.)

Module IV

Engineering ethics: Senses of Engineering Ethics - Variety of moral issues - Types of inquiry - Moral dilemmas - Moral autonomy. Kohlberg's theory - Gilligan's theory - Consensus and Controversy - Professional ideals and virtues - Attributes of an ethical personality - Theories about right action - Self interest.
Responsibilities and Rights of engineers - Collegiality and Loyalty - Respect for authority - Collective bargaining. Confidentiality - Conflicts of interest - Professional rights.

REFERENCES

1.John Seely, Oxford Guide to Writing and Speaking, Oxford University Press.
2.C. Muralikrishna and Sunita Mishra, Communication Skills for Engineers, 2nd Edition, Pearson, 2011.
3.Meenakshi Raman and Sangeetha Sharma, Technical Communication: Principles and Practice,
Oxford University Press, 2004.
4. Krishna Mohan and Meenakshi Raman, Effective English Communication,Tata Mc-GraHill,2000.
5. William Sanborn Pfeiffer, T.V.S. Padmaja, Technical Communication – A Practical Approach,
Pearson, 2007.
6. R.C. Bhatia, Business Communication, 2nd Edition, Ane Books Pvt. Ltd., 2008.
7. Krishna Mohan and Meera Banerji, Developing Communication Skills, Mac Millan India Ltd, 2000.
8. Jayashree Suresh and B.S. Raghavan, Professional Ethics, S. Chand & Company Ltd, 2005
9. Edmund D. Seebaur & Robert L. Barry, Fundamentals of Ethics for Scientists and Engineers, Oxford University Press, 2001

Type of Questions for End Semester Exam.
Q 1.Ten short answer questions of 2 marks each with at least 2 questions from each of the four modules. (10x2 = 20 marks)
Q 2. to Q.5 : Two questions A & B of 10 marks from each module with option to answer either A or B.(4 x 10 = 40 marks)
The questions shall be framed in such a way that they test the grammatical and communication skills of the student.

11L1A / 12L1B CIVIL ENGINEERING WORKSHOP

Masonry:
Construction of English bond and Flemish bond – wall junction – one brick – one and a half brick –and two brick thick

Plumbing:
Introduction to simple plumbing and sanitary fittings.

Surveying:
Surveying instruments – chain – compass – levelling instruments

Familiarization of latest building materials and testing.

Students shall collect the list of various building materials used for the construction of a building including their market rate.

Note : 50 % marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be conducted by two examiners. A candidate shall secure a minimum of 50 % marks in the aggregate and 45 % minimum in the end semester examination for a pass.

11L2A / 12L2B MECHANICAL ENGINEERING WORKSHOP

Objectives
Introduction to manufacturing process and their applications. Familiarization of various tools, measuring devices, practices and machines used in various workshop sections.

Preliminary exercises for beginners in all the following shops. Specific models may be designed by the teachers.

1) Fitting Shop.
2) Sheet Metal Shop
3) Foundry Shop
4) Welding Shop
5) Carpentry Shop

Note : 50 % marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be conducted by two examiners. A candidate shall secure a minimum of 50 % marks in the aggregate and 45 % minimum ***in the end semester examination for a pass.***

11L1B / 12L1A ELECTRICAL ENGINEERING WORKSHOP

1. One lamp controlled by one switch
2. Series and parallel connections of lamps.
3. Stair case wiring.
4. Hospital Wiring.
5. Godown wiring.
6. Fluorescent lamp.
7. Connection of plug socket.
8. Different kinds of joints.
9. Winding of transformers.
10. Soldering practice.
11. Familiarisation of CRO.
12. Single Phase Distribution Board Wiring.

Note : 50 % marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be conducted by two examiners. A candidate shall secure a minimum of 50 % marks in the aggregate and 45 % ***minimum in the end semester examination for a pass.***

11L2B / 12L2A COMPUTER PROGRAMMING LABORATORY

Application packages

Text Editor
1. To create a word document like an advertisement.
2. To illustrate the concept of mail merging in Word.

Spread Sheet
3. To create a spread sheet to analyse the marks of the students of a class and also to create appropriate charts.

Presentation Software
4. To create a presentation for the department using Power Point.

C Programming Basics

Operators & Expressions
5. To write a simple menu driven calculator program using switch statement

IO Formatting
6. To write a program to print Pascal's triangle.

Decision Making
7. To write a program for electricity bill preparation.

Looping
8. To write a program to print the *sine* and *cosine* series.

Arrays
9. To write a program to perform Matrix multiplication.
10. To write a program to prepare and print the sales report.

String
11. To write a program to perform string manipulation functions like *string concatenations, comparison, find the length and string copy* without using library functions.
12. To write a program to arrange names in alphabetical order.

Functions
13. To write a C program to calculate the mean, variance and standard deviation using functions.
14. To write a C program to perform sequential and binary search using functions.

Recursion
15. To write a program to print the Fibonacci series and to calculate the factorial of the given number using functions.

Structures
16. To print the mark sheet of n students using structures.

Pointers

17. To write a program using pointers to access the elements of an array and count the number of occurrences of the given number in the array.

Note: 50 % marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be conducted by two examiners. A candidate shall secure a minimum of 50 % marks in the aggregate and 45% ***minimum in the end semester examination for a pass.***

11 L3A / 12 L3B LANGUAGE LABORATORY

The **Language Lab** focuses on the production and practice of sounds of language and familiarizes the students with the use of English in everyday situations and contexts.

Objectives:

1. To expose the students to a variety of self-instructional, learner-friendly modes of language learning.
2. To help the students cultivate the habit of reading passages from the computer monitor, thus providing them with the required facility to face computer-based competitive exams.
3. To enable them to learn better pronunciation through stress on word accent, intonation, and rhythm.
4. To train them to use language effectively to face interviews, group discussions, public speaking.
5. To initiate them into greater use of the computer in resume preparation, report writing, format-making etc.

SYLLABUS :

The following course content is prescribed for the **English Language Laboratory** sessions:

1. Introduction to the Sounds of English- Vowels, Diphthongs & Consonants.
2. Introduction to Stress and Intonation.
3. Preparing business letters
4. Preparing a resume
5. Conducting a meeting and writing the minutes
6. Writing a report
7. Situational Dialogues / Role Play.
8. Oral Presentations- Prepared and Extempore.
9. 'Just A Minute' Sessions (JAM).
10. Describing Objects / Situations / People.
11. Debate
12. Group discussion

Note : 50 % marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be conducted by two examiners. A candidate shall secure a minimum of 50 % marks in the aggregate and 45 % ***minimum in the end semester examination for a pass.***

11L4 A / 12 L4 B

NATIONAL SERVICE SCHEME (NSS)

A student enrolling as member of NSS will have to complete 30 hours of training / social service to be eligible to earn the credits specified in the curriculum.
Grading shall be done by the faculty member handling the course based on punctuality, regularity in attending the classes and the extent of active involvement.

NATURE CONSERVATION

A student enrolling as member of the Nature Conservation Club will have to complete 30 hours of campus cleaning and greening activities to be eligible to earn the credits specified in the curriculum.
Grading shall be done by the faculty member handling the course based on punctuality, regularity in attending the activities and the extent of active involvement.