



Important Instructions to be followed while implementing the CBCS scheme for B.E.

first Year Students admitted in July 2015 onwards:

DEPARTMENTAL INTRODUCTORY COURSE:

Applicable to all departmental introductory courses such as

CE111 - Introduction to Civil Engineering,

ME112 - Introduction to Mechanical Engineering,

EC111 - Introduction to Electronics and Communication

CS112- Introduction to Computer Science and Engineering

IT111 - Introduction to Information Technology

EE111- Introduction to Electrical & Electronics Engineering

EEE 111 – Introduction to Electrical Engineering

EI111 - Introduction to Electronics & Instrumentation Engg. and so on!.

- 2 There will be **NO EXAMINATION** in departmental introductory courses. The grades earmarked will be awarded on the basis of internal Assessment.
 - 3 The main objective of introducing this course is to develop interest among students for the programme in which they are enrolled.
 - 4 This course is intended to be taken by the Head of the Department or Senior Professor of the Department.
 - 5 Professor (Course Mentor) is expected to introduce students to the programme in not more than two introductory lectures which will be followed by the below listed tasks to be performed individually by the students:
 - i. To look into the major sub-domains of their enrolled programme
 - ii. To look into major Industries and Research Departments working in the area relevant to their programme
 - iii. To find out about the journals and magazines published in the areas relevant to their programme
 - iv. To look into new developments and search about likely jobs, products and companies active in the areas relevant to their programme.
- Student will have to report to the Professor at least once in every 15 days and brief him/her about the progress made in the tasks.

Idea is to broadly introduce students about the programme in two lectures and allow them to explore, learn and understand about the scope, opportunities and current/ future trends in the discipline and its allied domain in a self-study mode. Students will be free to engage in learning from home or library.



Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			Theory	Practical	
B.E. Common	Mathematics - I	MA 110			
			Min. "D"	Min. "D"	5.0

Unit I

DIFFERENTIAL CALCULUS :

Expansion of functions by Maclaurin’s and Taylor’s theorem. Partial differentiation, Euler’s theorem and its application in approximation and errors, Maxima and Minima of function of two variables, Curvature : Radius of curvature, centre of curvature.

Unit II

INTEGRAL CALCULUS :

Definite Integrals : Definite Integrals as a limit of a sum , its application in Summation of series, Beta and Gamma Functions , Double and Triple Integrals, Change of Order of Integration, Area, Volume and Surfaces using double and triple Integral.

Unit III

DIFFERENTIAL EQUATIONS :

Solution of Ordinary Differential Equation of first order and first degree for Exact differential Equations, Solution of Ordinary Differential Equation of first order and higher degree (solvable for p, x and y, Clairauts Equation), Linear Differential Equations with Constant Coefficients, Cauchy’s Homogeneous differential Equation, Simultaneous differential Equations, Method of Variation of Parameters

Unit IV

MATRICES :

Rank, Solution of Simultaneous equation by elementary transformation, Consistency of System of Simultaneous Linear Equation, Eigen Values and Eigen Vectors, Cayley-Hamilton Theorem and its Application to find the inverse

Unit V

Algebra of Logic, Boolean Algebra, Principle of Duality, Basic Theorems, Boolean Expressions and Functions. Elementary Concept of Fuzzy Logic
Graph Theory : Graphs, Subgraphs, Degree and Distance, Tree, cycles and Network,



References:

- (i) Advance Engg. Mathematics. By Ramana, Tata McGraw hill.
- (ii) Higher Engineering Mathematics by BS Grewal, Khanna Publication
- (iii) Advance Engineering Mathematics by D.G.Guffy
- (iv) Engineering Mathematics by S S Sastri. P.H.I.
- (v) Mathematics for Engineers by S.Arumungam, SCITECH Publication
- (vi) Advanced Engineering Mathematics by Erwin Kreyszig, Wiley India



Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			Theory	Practical	
B.E. Common	Physics	PH110	Min. "D"	Min. "D"	5.0

Unit I

Quantum Physics : Group and particle velocities & their relationship. Uncertainty principle with elementary proof and applications (determination of position of a particle by a microscope, non existence of electron in nucleus, diffraction of an electron beam by a single slit). Compton scattering. Wave function and its properties, energy and momentum operators, time dependent and time independent Schrödinger wave equation. Application of time independent Schrödinger wave equation to particle trapped in a one dimensional square potential well (derivation of energy eigen values and wave function)

Unit II

Wave Optics: Interference: Fresnel's biprism, Interference in thin films (due to reflected and transmitted lght), interference from a wedge shaped thin film, Newton's rings and Michelson's interferometer experiments and their applications. Diffraction at single slit, double slit and n-slits (diffraction grating). Resolving power of grating and prism. Concept of polarized light, Brewster's laws, Double refraction, Nicol prism, quarter & half wave plate.

Unit III

Nuclear Physics: Nuclear liquid drop model (semi empirical mass formula), nuclear shell model, Linear Particle acceleratos: Cyclotron, general description of Synchrotron, Synchrocyclotron, and Betatron. Geiger-Muller Counter, Motion of charged particles in crossed electric and magnetic fields. Uses of Bainbridge and Auston mass Spectrographs.

Unit IV

Solid State Physics :Qualitative discussion of Kronig Penny model (no derivation), Effective mass, Fermi-Dirac statistical distribution function, Fermi level for Intrinsic and Extrinsic Semiconductors, Zener diode, tunnel diode, photodiode, solar-cells, Hall effect. Superconductivity: Meissner effect, Type I and Type II superconductors, Di-electric polarization, Complex permittivity, dielectric losses

UNIT V

Laser and Fiber Optics: Laser: Stimulated and spontaneous processes, Einstein's A & B Coefficients, transition probabilities, active medium, population inversion, pumping, Optical resonators, characteristics of laser beam. Coherence, directionality and divergence. Principles and working of Ruby, Nd:YAG, He-Ne & Carbon dioxide Lasers with energy level diagram.. Fundamental idea about optical fiber, types of fibers, acceptance angle & cone, numerical aperture, V-number, propagation of light through step index fiber (Ray theory) pulse dispersion, attenuation, losses & various uses. Applications of lasers and optical fibers.



Reference Books: -

1. Optics By Ghatak, TMH
2. Engineering Physics- V. S. Yadava, TMH
3. Optics by Brijlal and Subhainyan.
4. Engineering physics by M.N. Avadhanulu and. S. Chand & Co.(2004)
5. Atomic and Nuclear physics by Brijlal and Subraminiyan.
6. Concepts of Modern Physics- Beiser, TMH
7. Solid State Physics by Kittel ,Wiley India
8. Fundamentals of Physics-Halliday, Wiley India

List of suggestive core experiments: -

1. Biprism, Newton's Rings, Michelsons Interferometer.
2. Resolving Powers –Telescope, Microscope, and Grating.
3. G.M. Counter
4. Spectrometers-R.I., Wavelength, using prism and grating
5. Optical polarization based experiments: Brewster's angle, polarimeter etc.
6. Measurements by LASER-Directionality, Numerical aperture, Distance etc.
7. Uses of Potentiometers and Bridges (Electrical)..
8. Experiments connected with diodes and transistor.
9. Measurement of energy band gap of semiconductor.
10. To study Hall effect.
11. Solar cell.
12. To find the width of a single slit by a He-Ne Laser.
13. To determine the numerical aperture (NA) of an Optical Fibre.
14. To determine Planck's constant.
15. Other conceptual experiments related to theory syllabus.



Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			Theory	Practical	
B.E. Common	Basic Mechanical Engineering	ME-110	Min. "D"	Min. "D"	5.0

UNIT- 1

Materials: Classification of engineering material, composition of cast iron and carbon steels on iron-carbon diagram and their mechanical properties; Alloy steel and their applications; stress-strain diagram, Hooks law and modulus of elasticity. Tensile, shear, hardness and fatigue testing of materials.

UNIT-2

Measurement: Temperature, pressure, velocity, flow, strain, force and torque measurement, concept of measurement error & uncertainly analysis, measurement by Vernier caliper, micrometer, dial gauges, slip gauges, sine-bar and combination set; introduction to lath, drilling, milling and shaping machines.

UNIT-3

Fluids: Fluid properties, pressure, density and viscosity; pressure variation with depth, static and kinetic energy; Bernauli’s equation for incompressible fluids, viscous and turbulent flow, working principle of fluid coupling, pumps, compressors, turbines, positive displacement machines and pneumatic machines. Hydraulic power & pumped storage plants for peak load management as compared to base load plants.

UNIT-4

Thermodynamics: First and second law of thermodynamics; steam properties, steam processes at constant pressure, volume, enthalpy & entropy, classification and working of boilers, efficiency & performance analysis, natural and induced draught, calculation of chimney height. Refrigeration, vapor absorption & compression cycles, coefficient of perform (COP), refrigerant properties & eco friendly refrigerants.

UNIT-5

Reciprocating Machines: Steam engines, hypothetical and actual indicator diagram; Carnot cycle and ideal efficiency; Otto and diesel cycles; working of two stroke & four stroke petrol & diesel IC engines



Reference Books:-

1. Narula; Material Science; TMH
2. Agrawal B & CM; Basic Mechanical Engg. Wiley India
3. Nag PK, Tripathi et al; Basic Mechanical Engg; TMH
4. Rajput; Basic Mechanical Engg;
5. Sawhney GS; Fundamentals of Mechanical Engg; PHI
6. Nakra and Chaudhary; Instrumentation & measurement; TMH
7. Nag PK; Engineering Thermodynamics; TMH
8. Ganesan; Combustion Engines; TMH

List of Suggestive core Experiments(Please Expand it)

1. Tensile testing of standard mild steel specimen.
2. Experiments on Bernoulli's theorem.
3. Flow measurements by ventury and orifice meters.
4. Linear and angular measurement using, Vernier; micrometer, slip gauge, dial gauge and sine-bar.
5. Study of different types of boilers and mountings.
6. Experiment on mini-boiler (50 Kg/Hour)
7. To find COP of a refrigeration unit.
8. Study of different IC engines & measurement of B.H.P. using rope/belt dynamometer.
9. Analysis of exhaust gases on petrol, diesel & biodiesel engines.



Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			Theory	Practical	
B.E. Common	Communication Skills	HU110			
			Min. "D"	Min. "D"	5.0

Unit I - Languages and skills of communication

Linguistic techniques, Modern usages, Reading comprehension, English phonetic symbols/sings, Oral presentation, Audition Communication, Processes of Communication, Verbal and Non Verbal Communication, Barriers to Communication.

Unit II - Application of linguistic ability

Writing of definitions of Engineering terms, Objects, Processes and Principles (Listening) Topics of General Interest, Reproduction from business, daily life, travel, health, buying and selling, company structure, systems etc.

Unit III - Letter Writing:

Applications, Enquiry, Calling quotations, Tenders, Order and Complaint.

Unit IV

Precise Writing, Noting and drafting, Technical Description of simple engineering objects and processes (writing), Report writing, precise writing, Note writing, Slogan writing comment, Speech advertising.

Unit V

Writing Technical reports of the type of observation report, Survey report, Report of trouble, Laboratory Report and Project Report on the subjects of engineering. (Speaking) Vocabulary, Presentations, Demonstrations, Conversation – Telephone media, socializing, cultural events, debates, speech.



Topics to be covered in the Language laboratory sessions :

1. Basic Grammar & Vocabulary (Synonyms /Antonyms, Analogies, sentence completion, correctly spelt words, idioms, proverbs, common errors).
2. phonetic symbols and pronunciation.
3. Listening skills (Including Listening Comprehension)3
4. Reading Skills (Including Reading Comprehension)
5. Writing Skills (Including structuring resume and cover letter)
6. Speaking Skills
7. Body Language
8. Oral Presentation : Preparation and delivery using audio – visual aids with stress n
body language and voice modulation (Topic to be selected by the teacher.) Final Assessment Should be based on Assignment, presentation and interview.

Reference Books :-

1. Business Correspondence and Report Writing - By Sharma; TMH.
2. Living English Structure – By W.S. Allen; Longmans.
3. English Grammar – Ehrlich, Schaum Series; TMH.
4. Spoken English for India – By R.K. Bansal and IB Harrison Orient Longman.
5. New International Business English – by Joans and Alexander; OUP.
6. Effective Technical Communication – Rizvi; TMH.



Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
B.E. Common	Engineering Graphics	M.E-111	Theory	Practical	5.0
			Min. "D"	Min. "D"	

Unit I

Scales: Representative factor, plain scales, diagonal scales, scale of chords.

Conic sections: Construction of ellipse, parabola, hyperbola by different methods; Normal and Tangent.

Special Curves: Cycloid, Epi-cycloid, Hypo-cycloid, Involute, Archimedean and logarithmic spirals.

Unit II

Projection: Types of projection, orthographic projection, first and third angle projection, **Projection of points and lines**, Line inclined to one plane, inclined with both the plane, True Length and True Inclination, Traces of straight lines.

Unit III

Projection of planes and solids: Projection of Planes like circle and polygons in different positions; Projection of polyhedrons like prisms, pyramids and solids of revolutions like cylinder, cones in different positions.

Unit IV

Section of Solids: Section of right solids by normal and inclined planes; Intersection of cylinders.

Development of Surfaces: Parallel line and radial - line method for right solids.

Unit V

Isometric Projections: Isometric scale, Isometric axes, Isometric Projection from orthographic drawing.

Computer Aided Drafting (CAD): Introduction, benefit, software's basic commands of drafting entities like line, circle, polygon, polyhedron, cylinders; transformations and editing commands like move, rotate, mirror, array; solution of projection problems on CAD.



References

1. Visvesvaraya Tech. University; A Premier on Computer Aided Engg drawing; VTU Belgaum
2. Bhatt N.D.; Engineering Drawing, Charotar
3. Venugopal K.; Engineering Graphics; New Age
4. John KC; Engg. Graphics for Degree; PHI.
5. Gill P.S.; Engineering Drawing; kataria
6. Jeyopooan T.; Engineering drawing & Graphics Using AutoCAD; Vikas
7. Agrawal and Agrawal; Engineering Drawing; TMH Shah MB and Rana BC; Engg.drawing; Pearson Education
8. Luzadder WJ and Duff JM; Fundamental of Engg Drawing; PHI
9. Jolhe DA; Engg. Drawing an Introduction; TMH
10. 11 Narayana K.L.; Engineering Drawing; Scitech

List of Practical:

Sketching and drawing of geometries and projections based on above syllabus

Term work: A min. of 30 hand drawn sketches (on size A4 graphic sketch Book) plus 5 CAD-printouts on size A4 sheets plus 10 sheets of size A2 or 6 sheets of size A1, (50% marks to be allotted for this record + 25% marks for attendance +25%marks for Teachers Assesmen

Practical Marks to be allotted based on written test and viva.

Note: To cover above syllabus, each Institute must have CAD software and a computer lab (6 to 12 hrs/month/student).



Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of
B.E. Common	Computer Programming	CS 110	Theory	Practical	every even semester
			-	Min. "D"	5.0

Course Content & Grade

Introduction To 'C' Language

Character set. variables and identifiers, built-in data types. variable definition, arithmetic operators and expressions, constants and literals, simple assignment statement, basic input/output statement, simple 'c' programs.

Conditional Statements And Loops

Decision making within a program, conditions, relational operators, logical connectives, if statement, if-else statement, loops: while loop, do while, for loop. nested loops, infinite loops, switch statement, structured programming.

Arrays

One dimensional arrays: array manipulation; searching, insertion, deletion of an element from an array; finding the largest/smallest element in an array; two dimensional arrays, addition/multiplication of two matrices, transpose of a square matrix; null terminated strings as array of characters, representation sparse matrices.

Functions

Top-down approach of problem solving, modular programming and functions, standard library of c functions, prototype of a function: fooll parameter list, return type, function call, block structure, passing arguments to a function: call by reference, call by value, recursive functions, arrays as function arguments.

Structures And Unions

Structure variables, initialization, structure assignment, nested structure, structures and functions, structures and arrays: arrays of structures, structures containing arrays, unions.

Pointers

Address operators, pointer type declaration, pointer assignment, pointer initialization, pointer arithmetic, functions and pointers, arrays and pointers, pointer arrays.

File Processing

Concept of files, file opening in various modes and closing of a file, reading from a file, writing onto a file.

Reference

1. Let Us C-Yaswant kanetkar,BPB
2. Programming in ANSI C-E. Balagurusamy, TMH



Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
B.E. Common	Energy , Environment , Ecology & Society	ML-110	Theory	Practical	5.0
			Min. "D"	-	

Unit –I

Energy- Sources of Energy : Renewable & Non Renewable, Fossil fuel, Biomass Geothermal, Hydrogen, Solar, Wind, hydal, nuclear sources.

Unit –II

Ecosystem – Segments of Environment: Atmosphere, hydrosphere, Lithosphere, biosphere. Cycles in Ecosystem – Water, Carbon, Nitrogen. Biodiversity: Threats and conservation,

Unit –III

Air Pollution & Sound Pollution -

Air Pollution: Air pollutants, classification, (Primary & secondary Pollutants) Adverse effects of pollutants. Causes of Air pollution chemical, photochemical, Green house effect, ozone layer depletion, acid Rain.

Sound Pollution: Causes, controlling measures, measurement of sound pollution (deciblage), Industrial and non – industrial.

Unit –IV

Water Pollution– Water Pollution: Pollutants in water, adverse effects. Treatment of Domestic & Industrial water effluent.

Soil Pollution – Soil Profile, Pollutants in soil, their adverse effects, controlling measures.

Unit –V

Society, Ethics & Human values– Impact of waste on society. Solid waste management (Nuclear, Thermal, Plastic, medical, Agriculture, domestic and e-waste). Ethics and moral values, ethical situations, objectives of ethics and its study . Preliminary studies regarding Environmental Protection Acts , introduction to value education, self exploration, sanyam & swasthya.



References:

1. Harris, CE, Prichard MS, Rabin's MJ, "Engineering Ethics"; Cengage Pub.
2. Rana SVS ; "Essentials of Ecology and Environment"; PHI Pub.
3. Raynold, GW "Ethics in information Technology"; Cengage.
4. Svakumar; Energy Environment & Ethics in society; TMH
5. AK De "Environmental Chemistry"; New Age Int. Publ.
6. BK Sharma, "Environmental Chemistry" ; Goel Publ. House.
7. Bala Krishnamoorthy; "Environmental management"; PHI
8. Gerard Kiely, "Environmental Engineering" ; TMH
9. Miller GT JR; living in the Environment Thomson/cengage
10. Cunningham WP and MA; principles of Environment Sc; TMH
11. Pandey, S.N. & Mishra, S.P. Environment & Ecology, 2011, Ane Books , Pvt. Ltd, New Delhi
12. Joseph, B. Environmental Studies, 2009 Tata Mcgraw Hill, Edu India Ltd. New Delhi.
13. Gour R.R, Sangal, R &Bagaria, G.P. , Excel Books, A-45, Naraina Phase-I ,New Delhi.-110028



Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			Theory	Practical	
B.E. Common	Chemistry	CY110	Min. "D"	Min. "D"	5.0

Unit I

WATER AND ITS INDUSTRIAL APPLICATIONS : Sources, Impurities, Hardness & its units, Industrial water characteristics, softening of water by various methods (External & Internal treatment), Boiler trouble causes, effect & remedies, Characteristics of municipal water & its treatment, Numerical problems based on softening methods.

Unit II

FUELS & COMBUSTION: Fossil fuels & classification, Calorific value, Determination of calorific value by Bomb calorimeter Proximate and Ultimate analysis of coal and their significance, calorific value Computation based on ultimate analysis data, Carbonization, Manufacturing of coke & recovery of by products. Knocking, relationship between' knocking & structure of hydrocarbon, improvement of anti knocking characteristics of IC engine fuels, Diesel engine fuels, Cetane number, combustion and it related numerical problems.

Unit III

A. LUBRICANTS: Introduction, Mechanism of lubrication, Classification of lubricants, Properties and Testing of lubricating oils, Numerical problems based on testing methods.

B. CEMENT & REFRACTORIES: Manufacture , IS-code, Setting and hardening of cement, Refractory : Introduction, classification and properties of refractories .

Unit IV

HIGH-POLYMER :Introduction, types and classification of polymerization,Reaction. Mechanism, Natural & Synthetic Rubber; Vulcanization of Rubber, Preparation, Properties & uses of the following- Polythene, PVC, PMMA, Teflon, Poly acrylonitrile, PVA, Nylon 6, Nylon 6:6, Terylene, Phenol formaldehyde, Urea - Formaldehyde Resin, Glyptal, Silicone Resin, Polyurethanes; Butyl Rubber, Neoprene, Buna N, Buna S.

Unit V

A. INSTRUMENTAL TECHNIQUES IN CHEMICAL ANALYSIS : Introduction, Principle, Instrumentation and applications of IR, NMR,UV, Visible,Gas Chromatography, Lambert's and Beer's Law

B. WATER ANALYSIS TECHNIQUES : Alkalinity, hardness (Complexo-metric), Chloride, Free chlorine, DO, BOD and COD, Numerical problems based on above techniques.



Reference Books:

1. Chemistry for Environmental Engineering & Science- Sawyer, McCarty and Parkin – McGraw Hill, Education Pvt. Ltd., New Delhi
2. Engineering Chemistry - B.K. Sharma, Krishna Prakashan Media (P) Ltd., Meerut.
3. Basics of Engineering Chemistry - S. S. Dara & A.K. Singh, S. Chand & Company Ltd., Delhi
4. Applied Chemistry - Theory and Practice, O.P. Viramani, A.K. Narula, New Age International Pvt. Ltd. Publishers, New Delhi
5. Polymer Science – Ghosh, Tata McGraw Hill.
6. Engg. Chemistry –Shashi Chawla, Dhanpat Rai & company pvt. Ltd, Delhi.
7. Engg. Chemistry –Jain & Jain, Dhanpat Rai & company pvt. Ltd, New Delhi
8. A Text book of Engg. Chemistry- Agrawal, C.V, Murthy C.P, Naidu, A, BS Publication, Hyderabad.

Engineering Chemistry Practical

NOTE: At least 10 of the following core experiments must be performed during the session.

1. Water Testing

- (i) Determination of Total hardness by Complexometric titration method.
- (ii) Determination of mixed alkalinity
 - a) OH & CO₃
 - b) CO₃ & HCO₃
- (iii) Chloride ion estimation by Argentometric method.

2. Fuels & lubricant testing:

- (i) Flash & fire points determination by
 - a) Pensky Martin Apparatus,
 - b) Abel's Apparatus,
 - c) Cleveland's open cup Apparatus.
 - d) Calorific value by bomb calorimeter
- (ii) Viscosity and Viscosity index determination by
 - a) Redwood viscometer No.1
 - b) Redwood viscometer No.2
- (iii) Proximate analysis of coal
 - a) Moisture content
 - b) Ash content
 - c) Volatile matter content
 - c) Carbon residue
- (iv) Steam emulsification No & Anline point determination
- (v) Cloud and Pour point determination of lubricating Oil

3. Alloy Analysis

- (i) Determination of percentage of Fe in an iron alloy by redox titration using N-Phenyl anthranilic acid as internal indicator.
- (ii) Determination of Cu and or Cr in alloys by Iodometric Titration.
- (iii) Determination of % purity of Ferrous Ammonium Sulphate & Copper Sulphate.



Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
B.E. Common	Basic Electrical & Electronics Engineering	EE-110	Theory	Practical	5.0
			Min. "D"	Min. "D"	

Unit I

Electrical circuit analysis- Voltage and current sources, dependent and independent sources, source conversion, DC circuits analysis using mesh & nodal method, Thevenin's & superposition theorem, star-delta transformation.

1-phase AC circuits under sinusoidal steady state, active, reactive and apparent power, physical meaning of reactive power, power factor, 3-phase balanced and unbalanced supply, star and delta connections.

Unit II

Transformers-Review of laws of electromagnetism, mmf, flux, and their relation, analysis of magnetic circuits. Single-phase transformer, basic concepts and construction features, voltage, current and impedance transformation, equivalent circuits, phasor diagram, voltage regulation, losses and efficiency, OC and SC test.

Unit III

Rotating Electric machines- Constructional details of DC machine, induction machine and synchronous machine, Working principle of 3-Phase induction motor, Emf equation of 3-Phase induction motor, Concept of slip in 3-Phase induction motor, Explanation of Torque-slip characteristics of 3-Phase induction motor, Classification of self excited DC motor and generator.

Unit IV

Digital Electronics-Number systems used in digital electronics, decimal, binary, octal, hexadecimal, their complements, operation and conversion, floating point and signed numbers, Demorgan's theorem, AND, OR, NOT, NOR, NAND, EX-NOR, EX-OR gates and their representation, truth table, half and full adder circuits, R-S flip flop, J-K flip flop.

Unit V

ELECTRONIC COMPONENTS AND CIRCUITS- Introduction to Semiconductors, Diodes, V-I characteristics, Bipolar junction transistors (BJT) and their working, introduction to CC, CB & CE transistor configurations, different configurations and modes of operation of BJT, DC biasing of BJT.



References:

1. Vincent Del Toro, Electrical Engineering Fundamentals, PHI Learning, II Edition
2. S.Ghosh, Fundamentals of Electrical and Electronics Engineering, PHI, II Edition.
3. Millman, Halkias & Parikh, Integrated Electronics, Mc Graw Hill, II Edition
4. Nagrath & Kothari, Basic Electrical Engineering, III Edition TMH.
5. J.S. Katre, Basic Electronics Engg, Max Pub. Pune.
6. Hughes, Electrical and Electronic Technology, Pearson Education IX Edition

List Of Experiments

1. Verifications of Thevenin's Superposition theorem.
2. Study of Transformer, name plate rating, determination of ratio and polarity.
3. Determination of equivalent circuit parameters of a single phase transformer by O.C. and S.C. tests and estimation of voltage regulation and efficiency at various loading conditions and verification by load test.
4. Separation of resistance and inductance of choke coil.
5. Measurement of various line & phase quantities for a 3-phase circuit.
6. Identification of different Electronics components.
7. Observing input and output waveforms of rectifiers.
8. Transistor application as amplifier and switch.
9. Verification of truth table for various gates.



Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			Theory	Practical	
B.E. Common	Basic Civil Engineering & Engineering Mechanics	CE-110	Min. "D"	Min. "D"	5.0

Unit I

Building Materials & Construction

Stones, bricks, cement, lime, timber-types, properties, test & uses, laboratory tests concrete and mortar Materials: Workability, Strength properties of Concrete, Nominal proportion of Concrete preparation of concrete, compaction, curing.

Elements of Building Construction, Foundations conventional spread footings, RCC footings, brick masonry walls, plastering and pointing, floors, roofs, Doors, windows, lintels, staircases – types and their suitability

Unit – II Surveying & Positioning:

Introduction to surveying Instruments – levels, theodolites, plane tables and related devices. Electronic surveying instruments etc. Measurement of distances – conventional and EDM methods, measurement of directions by different methods, measurement of elevations by different methods. Reciprocal leveling.

Unit –III Mapping & Sensing:

Mapping details and contouring, Profile Cross sectioning and measurement of areas, volumes, application of measurements in quantity computations, Survey stations, Introduction of remote sensing and its applications.

Engineering Mechanics

Unit - IV

Forces and Equilibrium: Graphical and Analytical Treatment of Concurrent and non-concurrent Co- planner forces, free Diagram, Force Diagram and Bow’s notations, Application of Equilibrium Concepts: Analysis of plane Trusses: Method of joints, Method of Sections. Frictional force in equilibrium problems

Unit – V

Centre of Gravity and moment of Inertia: Centroid and Centre of Gravity, Moment Inertia of Area and Mass, Radius of Gyration, Introduction to product of Inertia and Principle Axes.

Support Reactions, Shear force and bending moment Diagram for Cantilever & simply supported beam with concentrated, distributed load and Couple.



Reference Books:

1. S. Ramamrutam & R.Narayanan; Basic Civil Engineering, Dhanpat Rai Pub.
2. Prasad I.B., Applied Mechanics, Khanna Publication.
3. Punmia, B.C., Surveying, Standard book depot.
4. Shesha Prakash and Mogaveer; Elements of Civil Engg & Engg. Mechanics; PHI
5. S.P, Timoshenko, Mechanics of structure, East West press Pvt.Ltd.
6. Surveying by Duggal – Tata McGraw Hill New Delhi.
7. Building Construction by S.C. Rangwala- Charotar publications House, Anand.
8. Building Construction by Grucharan Singh- Standard Book House, New Delhi
9. Global Positioning System Principles and application- Gopi, TMH
10. R.C. Hibbler – Engineering Mechanics: Statics & Dynamics.
11. A. Boresi & Schmidt- Engineering Mechanics- statics dynamics, Thomson' Books
12. R.K. Rajput, Engineering Mechanics S.Chand & Co.

List of suggestive core Experiments:

Students are expected to perform minimum ten experiments from the list suggested below by preferably selecting experiments from each unit of syllabus.

S.No. Title

1. To perform traverse surveying with prismatic compass, check for local attraction and determine corrected bearings and to balance the traverse by Bowditch's rule.
2. To perform leveling exercise by height of instrument of Rise and fall method.
3. To measure horizontal and vertical angles in the field by using Theodolite.
4. To determine (a) normal consistency (b) Initial and Final Setting time of a cement Sample.
5. To determine the workability of fresh concrete of given proportions by slump test or compaction factor test.
6. To determine the Compressive Strength of brick .
7. To determine particle size distribution and fineness modulus of coarse and fine Aggregate.
8. To verify the law of Triangle of forces and Lami's theorem.
9. To verify the law of parallelogram of forces.
10. To verify law of polygon of forces
11. To find the support reactions of a given truss and verify analytically.
12. To determine support reaction and shear force at a given section of a simply Supported beam and verify in analytically using parallel beam apparatus.
13. To determine the moment of inertia of fly wheel by falling weight method.
14. To verify bending moment at a given section of a simply supported beam.



Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			Theory	Practical	
B.E. Common	Basic Computer Engineering	CS-111	Min.“D”	Min.“D”	5.0

UNIT I

Computer: Definition, Classification, Organization i.e. CPU, register, Bus architecture, Instruction set, Memory & Storage Systems, I/O Devices, and System & Application Software. Computer Application in e-Business, Bio-Informatics, health Care, Remote Sensing & GIS, Meteorology and Climatology, Computer Gaming, Multimedia and Animation etc.

Operating System: Definition, Function, Types, Management of File, Process & Memory. Introduction to MS word, MS powerpoint, MS Excel

UNIT II

Introduction to Algorithms, Complexities and Flowchart, Introduction to Programming, Categories of Programming Languages, Program Design, Programming Paradigms, Characteristics or Concepts of OOP, Procedure Oriented Programming VS object oriented Programming.

Introduction to C++: Character Set, Tokens, Precedence and Associativity, Program Structure, Data Types, Variables, Operators, Expressions, Statements and control structures, I/O operations, Array, Functions,

UNIT III

Object & Classes, Scope Resolution Operator, Constructors & Destructors, Friend Functions, Inheritance, Polymorphism, Overloading Functions & Operators, Types of Inheritance, Virtual functions. Introduction to Data Structures.

UNIT IV

Computer Networking: Introduction, Goals, ISO-OSI Model, Functions of Different Layers. Internetworking Concepts, Devices, TCP/IP Model. Introduction to Internet, World Wide Web, E-commerce **Computer Security Basics:** Introduction to viruses, worms, malware, Trojans, Spyware and Anti-Spyware Software, Different types of attacks like Money Laundering, Information Theft, Cyber Pornography, Email spoofing, Denial of Service (DoS), Cyber Stalking, Logic bombs, Hacking Spamming, Cyber Defamation, pharming Security measures Firewall, Computer Ethics & Good Practices, Introduction of Cyber Laws about Internet Fraud, Good Computer Security Habits,

UNIT V

Data base Management System: Introduction, File oriented approach and Database approach, Data Models, Architecture of Database System, Data independence, Data dictionary, DBA, Primary Key, Data definition language and Manipulation Languages.

Cloud computing: definition, cloud infrastructure, cloud segments or service delivery models (IaaS, PaaS and SaaS), cloud deployment models/ types of cloud (public, private, community and hybrid clouds), Pros and Cons of cloud computing



List of Experiment

01. Study and practice of Internal & External DOS commands.
02. Study and practice of Basic linux Commands – ls, cp, mv, rm, chmod, kill, ps etc.
03. Study and Practice of MS windows – Folder related operations, My-Computer, window explorer, Control Panel,
04. Creation and editing of Text files using MS- word.
05. Creation and operating of spreadsheet using MS-Excel.
06. Creation and editing power-point slides using MS- power point
07. Creation and manipulation of database table using SQL in MS-Access.
- 08.WAP to illustrate Arithmetic expressions
9. WAP to illustrate Arrays.
10. WAP to illustrate functions.
11. WAP to illustrate constructor & Destructor
12. WAP to illustrate Object and classes.
13. WAP to illustrate Operator overloading
14. WAP to illustrate Function overloading
15. WAP to illustrate Derived classes & Inheritance
16. WAP to insert and delete and element from the Stack
17. WAP to insert and delete and element from the Queue
18. WAP to insert and delete and element from the Linked List

Recommended Text Books:

1. Fundamentals of Computers : E Balagurusamy, TMH
2. Basic Computer Engineering: Silakari and Shukla, Wiley India
3. Fundamentals of Computers : V Rajaraman, PHI
4. Information Technology Principles and Application: Ajoy Kumar Ray & Tinku Acharya PHI.

Recommended Reference Books:

1. Introduction of Computers : Peter Norton, TMH
2. Object Oriented Programming with C++ :E.Balagurusamy, TMH
3. Object Oriented Programming in C++: Rajesh K.Shukla, Wiley India
4. Concepts in Computing: Kenneth Hoganson, Jones & Bartlett.
5. Operating Systems – Silberschatz and Galvin - Wiley India
6. Computer Networks:Andrew Tananbaum, PHI
7. Data Base Management Systems, Korth, TMH
8. Cloud Computing, Kumar, Wiley India



Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			Theory	Practical	
B.E. Common	Language lab	HU 111			
			-	Min.“D”	5.0

Course objective:

This course intends to impart practical training in the use of English Language for Communicative purposes and aims to develop students’ personality through Language Lab.

Topics to be covered in the Language laboratory sessions:

1. Introducing oneself, family, social roles, personal image design, building relationships, body language, concept of time and space.
2. Public Speaking and oral skills with emphasis on conversational practice, Role plays, extempore speech, JAM (Just a minute sessions), describing objects and situations, giving directions, debate, telephonic etiquette.
3. Reading Comprehension: Intensive reading skills, rapid reading, and reading aloud (Reading material to be selected by the teacher).
4. Translation from English to Hindi and vice versa.
5. Oral Presentation: preparation and delivery (Topic to be selected by the teacher.)

Assessment Criterion:

Oral Presentation	10
Assignment	20
Viva Voice	20



Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			Theory	Practical	
B.E. Common	Work Shop Practice	M.E.-113	-	Min. "D"	5.0

Unit I

Introduction: Manufacturing Processes and its Classification, Casting, Machining, Plastic deformation and metal forming, Joining Processes, Heat treatment process, Assembly process. Powder Metallurgy, introduction to computers in manufacturing. Black Smithy Shop Use of various smithy tools. Forging operations: Upsetting, Drawing down, Fullering, Swaging, Cutting down, Forge welding, Punching and drafting. Suggested Jobs : Forging of chisel., forging of Screw Driver

Unit II

Carpentry Shop: Timber : Type, Qualities of timber disease, Timber grains, Structure of timber, Timber, Timber seasoning, Timber preservation .Wood Working tools: Wood working machinery, joints & joinery. Various operations of planning using various carpentry planes sawing & marking of various carpentry joints. Suggested Jobs :Name Plate ,Any of the Carpentry joint like mortise or tenon joint

Unit III

Fitting Shop: Study and use of Measuring instruments, Engineer steel rule, Surface gauges caliper, Height gauges, feeler gauges, micro meter. Different types of files, File cuts, File grades, Use of surface plate, Surface gauges drilling tapping Fitting operations: Chipping filling, Drilling and tapping.Suggested Jobs :Preparation of job piece by making use of filling, sawing and chipping , drilling and tapping operations.

Unit IV

Foundry: Pattern Making: Study of Pattern materials, pattern allowances and types of patterns. Core box and core print, .Use and care of tools used for making wooden patterns. Moulding: Properties of good mould & Core sand, Composition of Green , Dry and Loam sand. Methods used to prepare simple green and bench and pit mould dry sand bench mould using single piece and split patterns.

Unit V

Welding: Study and use of tools used for Brazing, Soldering, Gas & Arc elding. Preparing Lap & Butt joints using gas and arc welding methods, Study of TIG & MIG welding processes . Safety precautions.



Reference Books:

1. Bawa HS; Workshop Practice, TMH
2. Rao PN; Manufacturing Technology- Vol.1& 2, TMH
3. John KC; Mechanical workshop practice; PHI
4. Hazara Choudhary; Workshop Practices -, Vol. I & II.
- 5 Jain. R.K. Production Technology -



Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of
B.E. Common	Rural Outreach Course	HU 112	Theory	Practical	every even semester
				Min. "D"	5.0

The main objective of introducing this course is to sensitize students about the socio-cultural aspects of the rural areas parochial to their colleges. Students are expected to observe, investigate and learn about the following aspects of the rural region:

- i. Demographics, Literacy, Geographical parameters of the Village
 - ii. Schemes of government of India and State of Madhya Pradesh in operation in the villages
 - iii. Social/ Cultural aspects ranging from popular dance forms, music and customs of the concerned village
- There will be **NO EXAMINATION** in **HU112 Rural Outreach**. The grades earmarked will be awarded on the basis of internal Assessment.
 - This course shall be done by the students in a self-study mode. Study methodology shall comprise of combining field visits, case studies, analyzing policy documents from different government departments, discussions with field officers, active NGO's and so on.
 - The course will not be listed in the time-table and its activities shall be performed by the students at any time convenient to them.
 - The faculty associated with the course shall evaluate the candidate and grade him.
 - For evaluation purpose, students are expected to submit a hand-written summary on the government schemes and policies for the socio-cultural development of the concerned village. This shall be followed by final submission of two case studies covering broad spectrum of socio-cultural issues ranging from life in slums, infant mortality, watershed management, potability of water, animal welfare etc. These case studies (handwritten) shall be submitted to the mentor for the final evaluation of the coursework.
3. Programming In C-D.Ravichandran, New Age International
 4. Programming with C-B.Gottfried,TMH

Course Content & Grade



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			Theory	Practical	
B.E. Common	MATHEMATICS II	MA 111			
			Min. "D"	-	5.0

Unit I

Fourier Series: Introduction of Fourier series , Fourier series for Discontinuous functions, Fourier series for even and odd function, Half range series Fourier Transform: Definition and properties of Fourier transform, Sine and Cosine transform.

Unit II

Laplace Transform: Introduction of Laplace Transform, Laplace Transform of elementary functions, properties of Laplace Transform, Change of scale property, second shifting property, Laplace transform of the derivative, Inverse Laplace transform & its properties, Convolution theorem, Applications of L.T. to solve the ordinary differential equations

Unit III

Second Order linear differential equation with variable coefficients : Methods one integral is known, removal of first derivative, changing of independent variable and variation of parameter, Solution by Series Method

Unit IV

Linear and Non Linear partial differential equation of first order: Formulation of partial differential equations, solution of equation by direct integration, Lagrange's Linear equation, charpit's method. Linear partial differential equation of second and higher order: Linear homogeneous and Non homogeneous partial diff. equation of nth order with constant coefficients. Separation of variable method for the solution of wave and heat equations

Unit V

Vector Calculus: Differentiation of vectors, scalar and vector point function, geometrical meaning of Gradient, unit normal vector and directional derivative, physical interpretation of divergence and Curl. Line integral, surface integral and volume integral, Green's, Stoke's and Gauss divergence theorem

References

- (i) Advanced Engineering Mathematics by Erwin Kreyszig, Wiley India
- (ii) Higher Engineering Mathematics by BS Grewal, Khanna Publication
- (iii) Advance Engineering Mathematics by D.G.Guffy
- (iv) Mathematics for Engineers by S.Arumungam, SCITECH Publuication
- (v) Engineering Mathematics by S S Sastri. P.H.I.

Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem	CGPA at
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					the end of
Departmental Core Course	Introduction Civil Engineering	CE111	Theory	Practical	every even semester
			-	Min. "D"	5.0

COURSE OBJECTIVE:

This course introduces students to civil engineering and its sub-domains. Students are expected to learn about scope, current and future trends in infrastructure industry, jobs, innovations & research opportunities in the field of civil engineering. Course content will be covered through lectures, assignments, case-studies, presentations, documentaries and field visits.

COURSE CONTENT:

Overview of Civil Engineering, types of Infrastructures, Effect of infrastructure facilities on economy and environment, Role of Civil Engineers in the infrastructural Development Introduction to sub-domains of Civil Engineering, Size of Infrastructure Industry, emerging trends in infra spending through public and public-private partnership (PPP), talent shortage, and global trends in workforce mobility and skill-demands.

Stages in the life of construction – Design, Construction, Maintenance, Repair, Demolition/Recycling; an overview of Indian Standards, units and conversion factors for Lengths, Areas, Volumes and Weights; Opportunities and challenge of India’s Infrastructure, Interdisciplinary nature of Civil Engineering Projects.

Roads: Types of Roads, Nagpur Road Plan, Components of Road and their function; Bridges: Important parts of bridges, classification of bridges; Types of Dams.

Properties and classification of common building materials – Stones, Bricks, Sand, Limes, Cement, Mortar, Concrete, Steel.

Overview of Indian Road Congress, National Highway Authority of India (NHAI) and American Society of Civil Engineers (ASCE), Emerging areas and new technologies in the field of civil engineering.

COURSE OUTCOMES

After successful completion of course, Students are expected to possess an in-depth understanding and knowledge about the scope, current and future trends in infrastructure industry, elementary terminologies, learning resources and career-opportunities in the field of civil engineering and its allied domains.

EVALUATION

Evaluation will be continuous an integral part of the class only through internal assessment

REFERENCES

Elements of Civil Engineering by MD Saikia, B Mohan Das, MM Das, PHI Learning Private Limited,



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL

2015

Prakash M.N. Shesha, Ganesh B., A Textbook on Elements of Civil Engineering, PHI Learning Pvt. Ltd. Study material provided by the instructor



Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of
Departmental Core Course	Introduction Computer Science & Engineering	CS112	Theory	Practical	every even semester
			-	Min. "D"	5.0

COURSE OBJECTIVE:

To Introduce:

- Course Structure & Scope of the branch
- The basic concepts in Computer Science & Engineering
- The different styles of programming
- Types & important features of programming languages

COURSE CONTENT:

CBCS Guidance/ Counselling / Advices, Complete course structure/scheme, Continuous Evaluation System. Relevance & Importance of each subject, Specialization Flow Diagram, Pre-requisite Flow Diagram, Scope of the Branch and Future Avenues.

Review of Computer Engineering Fundamentals: Definition, Evolution, Classification, Number System, Organization i.e. CPU, register, Bus Architecture, Instruction Set, Memory & Storage Systems, I/O Devices & Application Software

Computer Science & Engineering Application in: Data Processing, Information Systems, Communication, Interworking, World Wide Web, e-Business, Bio-Informatics, Health Care, Remote Sensing & GIS, Meteorology and Climatology, Computer Gaming, Multimedia and Animation etc, Defence.

Introduction to flowchart, Algorithm, Categories of Programming Languages, Program Design, What are data structures, Introduction to Programming, Security Threats: Viruses, Worms, Malware, Trojans, Spyware, and anti-spyware software, firewall, internet fraud.

Overview and idea about good computer magazines, Major Computer Science & Engineering Journals, Case Studies/ Success Stories of Computer Engineers, Professional Societies and associations, Computing Ethics & Good Practices.

COURSE OUTCOMES

After successful completion of course, students will be able to:

- Know course structure & scope of the branch
- Know the basic concepts in Computer Science & Engineering
- Compare different styles of programming languages
- Will start writing algorithm for problems

EVALUATION

Evaluation will be continuous an integral part of the class only through internal assessment



TEXT/ REFERENCES:

Subhasis Banerjee, S. Arun Kumar, D. Dubhashi, Introduction to Computer Science, Peter Norton, Computing Fundamentals, McGraw Hill India

Peter Norton, Introduction to Computers, TMH

Silakari & Rajesh K Shukla, Basic Computer Engineering, Wiley

India Kenneth Hoganson, Concepts in Computing , Jones & Bartlett

RJ Dromey, How to solve it by computer, Prentice Hall India Series, 2007



Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of
Departmental Core Course	Introduction Electronics & Instrumentation Engineering	EI111	Theory	Practical	every even semester
			-	Min. "D"	

COURSE OBJECTIVE:

- To familiarize the students with the evolution and basics of Electronics & Instrumentation Engineering.
- To introduce the various sub-domains of Electronics & Instrumentation Engineering

COURSE CONTENT:

INTRODUCTION

General overview of Electronics Engineering and its sub domains, History of Electronics Engineering, Applications of electronics, Electronic components, Very Large Scale Integration (VLSI)

STATISTICAL FUNDAMENTALS:

Basic characteristics of measuring devices, types of errors and their statistical analysis, accuracy, precision and ratings of instruments, fundamental, derived and international systems of units and their conversion. Calibration, Primary and Secondary Standards.

INSTRUMENTATION FUNDAMENTALS

Generalized Configuration & Fundamental Description of Measuring Instruments, Principle of working of various instruments used to measure basic electronic parameters, elements of basic instrumentation systems.

SCOPE & OPPORTUNITIES

Overview of Electronics Instruments Industries in India and Abroad; Current status, contribution to GDP, export and growth potential, organizational structure, manpower requirement, and future prospects. Employment opportunities, Nature of Job, risks and challenges involved, Exploration of career and professional development opportunities, Latest trends in VLSI Design.

INNOVATION AND RESEARCH

Overview of notable National Research Organizations/ Authorities/ Societies/ Forums such as etc. Emerging areas and new technologies in the field of Electronics & Instrumentation Engineering, Overview of Peer Reviewed Journals, and Magazines Published in the field of Electronics & Instrumentation Engineering, Systematic Ways of Research and Objectives of Research.

COURSE OUTCOMES

After successful completion of course, students are expected to



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1. To understand the fundamentals of electronics & instrumentation.
2. To become aware of the scope, opportunities and trends in the various sub-domains of electronics & instrumentation.

EVALUATION

Evaluation will be continuous an integral part of the class only through internal assessment

REFERENCES:

Bernard M. Oliver, J.M. Cage, Electronic Measurement and Instrumentation, McGraw Hill

Albert D Helfrick, William D Cooper, Modern Electronics Instrumentation and Measurement Techniques, Pearson Ed

All other course materials will be provided by the instructor



Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of
Departmental Core Course	Introduction Mechanical Engineering	ME112	Theory	Practical	every even semester
			-	Min. "D"	5.0

COURSE OBJECTIVE:

This course introduces students to mechanical engineering and its sub-domains. Students are expected to learn about scope, current and future trends, jobs, innovations & research opportunities in the field of mechanical engineering. Course content will be covered through lectures, assignments, case-studies, presentations, documentaries and field visits.

COURSE CONTENT:

What is Engineering, Who are Mechanical Engineers, Overview of Mechanical Engineering, its domains, scope and its utility in different areas; Specializations available with in mechanical Engineering (thermal, production and design) and job opportunities in mechanical Engineering.

Basic definitions of terms related to Thermodynamics, First and Second law of Thermodynamics, Properties of Steam, Introduction to Boilers, Terminology of IC Engines, Two and Four Stroke Petrol and Diesel Cycle.

Introduction to mechanical properties, basic manufacturing processes, pattern, type and its use in metal casting, Introduction of welding, brazing and soldering processes

Case study on any topic from Manufacturing Engineering Magazine Published by Society of Manufacturing Engineers (USA), Machinist Magazine, Technorama published by Institution of Engineers (India) and Manufacturing Today and any other magazine related to mechanical engineering..

Overview of American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Society of Automotive Engineers, American Society of Mechanical Engineers (ASME); Indian Society of Mechanical Engineers (ISME) etc ; Emerging areas and new technologies in the field of mechanical engineering (3D Printing)

COURSE OUTCOMES

After successful completion of course, Students are expected to possess basic understanding and knowledge about the scope, current and future trends in mechanical engineering. The versatility of the mechanical engineering branch and career-opportunities in this field will enable the students to explore the new avenues in their future endeavours.

EVALUATION

Evaluation will be continuous an integral part of the class only through internal assessment



REFERENCES

Jonathan Wickert, Kemper Lewis, An Introduction to Mechanical Engineering, CENGAGE Learning.

Michael Clifford, Kathy Simmons, Philip Shipway, An Introduction to Mechanical Engineering: Part 1 and Part 2, Taylor and Francis



Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of
Departmental Core Course	Introduction Electronics Engineering	EC111	Theory	Practical	every even semester
			-	Min. "D"	5.0

COURSE OBJECTIVE:

1. To understand the construction, identification, characteristics, specifications, merits, limitations and applications of electronic components and materials
2. To understand communication, audio and video communication, and microwave communication
3. To fill the gap between learning and application
4. To explore varied career options

COURSE CONTENT:

INTRODUCTION: What is electronics, An introduction to Electronic devices & circuits, Analog and digital electronics, Analog communication, Digital communication, Microwave engineering, Micro processor & controllers, Antenna, Signals & systems.

SCOPE AND APPLICATIONS: Wireless communication, Satellite Communication, Internet Telephony, Nanotechnology ,Teleconferencing, Embedded System, Wireless Sensor Networks, Optical Computing, Electrocardiograph, Display Technology, Advanced Optical Networks, Brain Computer Interfaces, Thin Film Technology, Global positioning system, Fiber Optics, Micro electro mechanical systems, Robotics, Radar, Speaker Recognition, Microwave Communication, Earthquake Monitoring, Remote Sensing, Direct to Home TV systems, Wireless Communication(mobile phones, geographical navigation, satellite communication, Wi-Fi etc.)

SOME OF THE GOVT. SECTOR / PRIVATE SECTOR ELECTRONICS LABS /DIVISION /COMPANIES:

CSIR LABS, CSIO, DRDO, BSNL , BEL, BHEL, C-DAC, DOORDARSHAN, IS RO, TBRL, IIT'S , VIDEOCON, ONIDA, HAIER, LG ELECTRONICS, PIONEER, LLYOD HITACHI, HP APPLE, WIPRO ,ELICO,

TELECOM COMPANIES: Top companies of VLSI, Fabrication units in India and abroad

CAREER OPTIONS: Telecommunication, Software Development, Consumer Electronics, Semiconductor, Embedded Systems etc.

Product Based Company – Building their own product and selling it in market,

Service Based Company – Building product, application or part of them, for other companies and their clients

Telecom equipment R&D, EDA Company

Electronic Exchanges, Department of Telecommunications, BSNL, Railways, Electricity Board, Medical equipments manufacturing



COURSE OUTCOMES

To prepare the students according to the requirements of industry for highly skilled engineers and contribute to the next generation technology by their innovation.

EVALUATION

Evaluation will be continuous an integral part of the class.

REFERENCES

Study material provided by the instructor



Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of
Departmental Core Course	Introduction Electrical Engineering	EE111	Theory	Practical	every even semester
			-	Min. "D"	5.0

COURSE OBJECTIVE:

This subject has been introduced for the undergraduate students of B.E. Electrical Engineering as an introductory minor course giving a broad spectrum of the prevalent technologies, carrier opportunities and prospects in the area of academics, industries and research and development in leading organizations.

COURSE CONTENT:

An overview of Electrical Engineering, Generation, Transmission and Distribution, Distributed generation, National Power Grids, Smart Grid
Various electrical equipments viz Transformer, Induction motor, synchronous machine, Circuit Breakers etc, Relays, substation components, Product specification, application
Leading manufacturers of Electrical equipments and components, Electrical Engineering research organization, PSUs and utilities
General Introduction to Power Electronics, Power System, Electrical Machines, Control System, Automation

Role of Electrical Engineer in Industry, R&D, Electrical Utilities, Placement scenario, future trends

COURSE OUTCOMES:

The final outcome of the subject will result into an enhancement in understanding vast spectrum of opportunities and applications of electrical engineering for an incumbent undergraduate student. Latest trends and technologies in the area of renewable energy, smart grid and industrial control will be the key outcome of this subject.

EVALUATION:

Evaluation will be continuous an integral part of the class only through internal assessment

REFERENCES:

1. D.P. Kothari & I.J. Nagrath, Basic Electrical Engineering, Tata McGraw Hill, latest edition.
2. M.S. Sukhija, T. K. Nagsarkar, Basic Electrical and electronics engineering, Oxford University press,2012



Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			Theory	Practical	
Departmental Core Course	Introduction Information Technology	IT111			
			-	Min. "D"	5.0

COURSE OBJECTIVE:

This course introduces students about the basic fundamentals of Information Technology (IT). Students are expected to learn about applications of IT in communication, multimedia, internet and cloud computing.

COURSE CONTENT:

Data and Information: Introduction, Type of data, Simple model of computer.

Data processing using a computer: Introduction to Operating System, Data storage Media, High capacity network storage media.

Introduction to Database Management System; Database modelling; Relational model; Distributed DBMS; Data warehouse, Data mining; Classification of Language and Applications

IT Application in Communication: Network services-telephone services, Cellular telephone services, Radio and TV broadcasting, Audio-Visual conferencing, Video-on-demand.

Internet Technology: Introduction, Working of internet, Introduction to network protocol and topologies, Types of network: LAN, WAN, Web browser.

Internet Services: E-mail, Telnet, FTP, WWW, HTML, URL.

IT Application in Multimedia: Introduction, Components of multimedia and challenges, Video compression, Video coding technology: JPEG, MPEG, And JBIG.

Introduction to cloud computing: Types, Services, Models, Characteristics, Benefits and Challenges, Application, Limitations.

IT Application in E-Commerce and E-Governance: Introduction, Different Types of E- Commerce with examples, Advantages and disadvantages, E-Commerce in India, E-Services, E-Commerce security, Internet security and ethics, Technology issues, Social issues, Introduction to E-Governance, Challenges, Application, advantages, Case study of MP-online and IRCTC

Social impact of information technology: Introduction, Social Uses of World Wide Web, Social networking Services, Privacy, security and integrity of Information ,Disaster recovery Intellectual property rights, IT Enabled Services and careers, Career in information technology, Case study of NPTEL.

EVALUATION

Evaluation will be continuous an integral part of the class only through internal assessment

REFERENCES:



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL

1. V.Rajaraman, Introduction to Information Technology; PHI
2. E Balagurusamy, Fundamentals of Computers, TMH
3. Santiram Kal Basic Electronics, PHI
4. M.N. Rao Cloud Computing, PHI