

BHAVNAGAR UNIVERSITY

BHAVNAGAR



SYLLABUS OF
BECHELOR OF ENGINEERING (INFORMATION TECHNOLOGY)
[B.E. (I.T.)]

University Campus, Gaurishanka Lake Road, Bhavnagar – 364 022 (Gujarat)

BHAVNAGAR UNIVERSITY
B.E. FIRST YEAR (IC/EC/IT/ELECT)

IEIE-101 FUNDAMENTAL OF COMPPUTER & PROGRAMMING

Teaching scheme			Examination scheme				Total Marks
Theory Hours	Tut. Hours	Pract. Hours	Theory		Pra/Oral Marks	T/W Marks	
			Marks	Hours			
2	0	2	100	3	25	25	150

(1) INTRODUCTION TO COMPUTER:

History, evolution, general block diagram and architecture of computer, function of various blocks of PC, different types of Input and output Devices, Memory organizations and types. Functions of different parts of motherboard, different types of interfacing ports

(2) OPERATING SYSTEM

Introduction and fundamentals of latest DOS and windows operating system, types, structure and services of operating system

(3) APPLICATION PACKAGES

Introduction and working with different application packages like word, PowerPoint, excel, access etc.

(4) PROGRAMMING

Introduction to different types of programming languages, algorithm and flowchart technique, basic structure of program, constant, variable & data types different types of operators and expressions .formatted Data input and output, various types of control statements, different decision making and looping methods, single and multi dimensional arrays, various way of handling strings, functions and life time and scope of variables, structures and unions, pointers, file managements, graphical statements to draw point, line, circle etc. selection of colors and feeling colors into the figures , preprocessor

TERMWORK/PRACTICALS: should be based on above syllabus

BOOKS:

- | | |
|--|--|
| 1. programming in C | E-Balaguruswamy, TMH |
| 2. Let Us C | Yashwant kanetkar, BPB |
| 3. programming with c | Byron S. Gottfried, schaum series, TMH |
| 4. MS Office | Tata MC graw hill |
| 5. PC Software made simple | TAXALI |
| 6. Fundamentals of computer & programming with C | G. S. BALUJA, G. K. BALUJA |
| 7. Fundamentals of computer & programming | Devesh Jinvala & Bankim |

BHAVNAGAR UNIVERSITY
B.E. FIRST YEAR(IC/EC/IT/ELECT)

IEI-102 MATHEMATICS

Teaching scheme			Examination scheme				Total Marks
Theory Hours	Tut. Hours	Pract. Hours	Theory		Pra/Oral Marks	T/W Marks	
			Marks	Hours			
3	0	0	100	3	0	0	100

1. Differential Calculus

- a) nth derivative, Leibniz theorem, Maclaurian's and Tailors expansions, Limits of indeterminate forms, L Hospital's rule.
- b) Partial Differential Equation : Partial derivatives, Euler's Theorem on homogeneous functions, total derivative, derivatives of implicit function, change of variables, Jacobians, partial derivative of implicit function by Jacobians, approximation and error, maxima and minima of function of two variables, stationary values by the method of Lagrange's undetermined multipliers.
- c) Curvature : Definition, Cartesian, polar parametric form, Newton's and series method for radius of curvature.

2. Integral Calculus

- a) Curve Tracing : Tracing of curves in Cartesian polar and parametric form, Simple standard curve, (curves of the type $x^3 + y^3 = 3xy$, should be omitted)
- b) Reduction Formula of following type:
- c) Beta and Gamma functions, their simple properties and relation between them
- d) Application of integral area, volume, length, of curve. Double and triple integrals, change of order of integral, change to polar form, use of double triple integral to find area, volume.

3. Infinite Series

Convergence and divergence of infinite series, geometric series, comparison test, integral test, D-Lamberts ratio test, Cauchy's root test, alternating series.

4. Complex Algebra

Armand diagram, De-moiré's theorem, roots of algebraic equation, circular functions, hyperbolic functions, logarithmic and exponential functions, separation into real and imaginary parts.

5. Matrix Algebra

Elementary transformations and rank, consistency of linear systems of equations, system of homogeneous equations, Eigen value and eigen vector.

6. Vector Calculus

Differentiation of vectors, velocity & acceleration, scalar and vector points functions, vector operator del, gradient divergence and curl. Integration of vectors, line integral, circulation work, Statement of Green's and stoke's theorem.(without proof)

7. Differential equation of first order & first degree

Linear equations, Bernoullis equation, exact equations, application of differential to problems of simple electric circuits, heat flow, rate of radio active material Newton's law of cooling etc. Orthogonal trajectories

BOOKS:

1. Elementary engineering mathematics by B.S.Grewal
2. Engineering mathematics 1&2 by P.N. Wartikar & J.N.Wartikar
3. Engineering mathematics 1&2 by Shantinakaran

BHAVNAGAR UNIVERSITY
B.E. FIRST YEAR(IC/EC/IT)

IEI-103 CIVIL ENGINEERING DRAWING AND SURVEYING

Teaching scheme			Examination scheme			Total Marks	
Theory Hours	Tut. Hours	Pract. Hours	Theory		Pra/Oral Marks		T/W Marks
			Marks	Hours			
2	0	2	100	4	25	25	
						150	

(A) CIVIL ENGINEERING DRAWING :

1. BASIC CONCEPT:

Preparation of working drawing (including plan, elevation, section) of single storey buildings and factories from a given line sketch OR from given measurements; Types of drawings, line plan, foundation plan and detailed drawing of door, window, ventilator, chhajjas, beam, column, foundations, floor, etc.

2. FUNCTIONAL PLANNING:

Principles of planning of small residential and industrial buildings, minimum standards as per I.S. code, main provisions of building bylaws for residential and industrial buildings, climatic consideration for planning of buildings.

3. PREPARING SKETCHES FOR BUILDING COMPONENTS:

Type of walls, doors, windows, columns, beams, floors, roofs & slabs, foundation for building and heavy machines, symbols for different materials in section, electrical installation and wiring diagram for buildings, brick bonds.

(B) SURVEYING:

1. Introduction:

Surveying and leveling, Principles, scope and importance

2. Chain and Compass Survey:

Chain, tapes, Methods, Instruments used for taking off-sets, Correction for sloping grounds, Obstacles, Accuracies, Correction, Types & uses of compass, Principles, Procedures, Angles-WCB, RB, Local attraction, Computation of angles, Declination and dip of needle examples.

3. Leveling:

Definition and terms used, leveling instruments, Dumpy, Tilting and Automatic levels, Temporary and permanent adjustments, Principles, Profile leveling and cross sectioning, Plotting, Curvature and refraction, Reciprocal leveling, methods, Precautions and corrections, Contouring, Characteristics and uses, methods, examples

4. Theodolite:

Terms, general features, Temporary & permanent adjustments, Measurement of horizontal and vertical angles, Theodolite traverse, Latitude and departure, balancing, fundamental lines / axes and their established interrelation examples.

5. Plane table survey:

Principles, Instruments and accessories, methods, two point & three point problem, advantages & applications, field work, examples.

6. Noise pollution

Introduction, sources of noise pollution, effect of noise pollution, remedial measures and standard parameters.

PRACTICAL / ORAL:

The practical/oral marks shall consist of oral exam based on subject inclusive of termwork prepared.

TEXT BOOKS :

- | | |
|---------------------------------------|---------------------------------|
| 1. Engineering Drawing (Vol-I & II) | by P.J.Shah |
| 2. Engineering Drawing | by N.D. Bhatt |
| 3. Machine Drawing | by N.D. Bhatt |
| 4. Civil Engineering Drawing | by Guruchansingh |
| 5. Civil Engg. Drawing | by Malik & Meo. |
| 6. CIVIL ENGG. MATERIALS | by SHUSHIL KUMAR GURCHARANSINGH |
| 7. CIVIL ENGG. MATERIALS | by KULKARNI |
| 8. SURVEYING | by AGOR, B.C. PUNMIA, KANETKAR |

BHAVNAGAR UNIVERSITY
B.E.FIRST YEAR [IC / EC / IT / E]

104-B: STRENGTH & MECHANICS OF MATERIALS

TEACHING SCHEME			EXAMINATION SCHEME				TOTAL MARKS
THEORY HOURS	TUT. HOURS	PRACT. HOURS	THEORY		PRA/ORAL MARKS	T/W MARKS	
			MARKS	HOUR			
2	0	2	100	4	25	25	150

1. INTRODUCTION:

SCLALAR AND VECTOR QUANTITES, FORCE, COMPOSITION AND RESOLUTION OF VECTORS, SYSTEM OF UNITS. UNITS FO SAPACE, TIME AND FORCE, DERIVED UNITS.

2. STATICS:

IDEALIZATION OF BODIES, REGID BODIES, FREE BODY DIAGRAMS. PRINCIPLE OF RANSMISSIBILITY AND SUPER POSITION. TYPE OF FORCES, COMPOSITION AND EQUILIBRIUM OF COPLANAR, CONCURRENT AND NON-CONCURRENT FORCES, PARALLEL AND NON-PARALLEL FORCE BY ANALYTICAL AND GRAPHICAL METHODS MOMENT OF FORCE, COUPLES AND THEIR PROPERTIES. EQUIVALENT FORCE-COUPLE SYSTEMS. SIMPLE CASES OF COMPOSITION AND EQUILIBRIUM OF NON-COPLANAR, CONCURRENT AND NON-CONCURRENT FORCE SYSTEM USING VECTOR APPROACH

3. BEAMS:

TYPES OF SUPPORTS-FIXED, HINGED, FRICTION AND ROLLER. TYPES OF STATICALLY DETERMINATE BEAMS, TYPES OF LOADS. SUPPORT REACTION OF BEAMS. CONCEPT OF INTERNAL HINGES AND BRACKETS. COMPUTATION OF INTERNAL FORCES IN SIMPLE PLANE TRUSSES- ANALYSIS BY VARIOUS METHODS.

4. CENTRE OF GRAVITY AND MOMENT OF INERTIA:

CONCEPT OF CENTRE OF GRAVITY OF LINES, PLANE AREA, VOLUMES AND BODIES. PAPPUS GULDINUS THEOREMS. MOMENT OF INERTIA OF AREA, PARALLEL AXES THEOREM AND POLAR MEMNT OF INERTIA. MASS MOMENT JOF INERTIA OF RIGID BODIES

5. FRICTION:

DEFINITIONS OF FRICTIONAL FORCE, LIMITING FRICTION, COEFFICIENT OF STATIC FRICTION, ANGLE OF FRICTION, ANGLE OF REPOSE, CONE OF FRICTION. LAWS OF FRICTION. ILLUSTRATION OF FRICTION IN NATURE AND ENGINEERING, SLIDING OF RIGID KBODIES ON HORIZONTAL AND ON INCLINED PLANE, WEDGE FRICTION, LADDER FRICTION, BELT AND ROPE FRICTION, SCREW FRICTION.

6. SIMPLE LIFTING MACHINES

7. KINEMATICS:

RELATIVE VELOCITY OF PARTICLE AND MOTION OF RIGID BODIES.

8. KINETICS:

[A] PARTICLE:

MASS INERTIA OF BODY, APPLICATION OF NEWTON'S LAW OF MOTION, CONSTANT AND VARIABLE FORCES FOR RECTILINEAR MOTION INCLUDING INCLINED PLANE AND COMPOUND PULLEY ARRANGEMENTS. D'ALEMBERT'S PRINCIPLE, EQUATION OF CURVILINEAR MOTION IN RECTANGULAR COMPONENTS AND IN TANGENTIAL AND NORMAL COMPONENTS APPLICATION OF TORQUE AND MASS MOMENT OF INERATIA. FLY WHEEL AND ITS FUNCTION, MOTION OF VEHICLES ON LEVEL AND BANKED ROADS. PRINCIPLE OF WORK AND ENERGY. POTENTIAL AND KINETIC ENERGY, CONSERVATION OF ENERGY; POWER, PRINCIPLE OF IMPULSE AND MOMENTUM. CONSERVATION OF MOMENTUM AND ANGULAR MEMENTUM. IMPACT OF ELASTIC BODIES, AND THEIR NATURE. LOSS OF KINETIC ENERGY AND COEFFICIENT OF RESTITUTION.

[B] RIGID BODIES:

EQUATION OF MOTION FOR PLANE MOTION AND D'ALEMBERT'S PRINCIPLE. PRINCIPLE OF WORK AND ENERGY FOR A RIGID BODY.

9. STRENGTH AND ELASTICITY OF MATERIALS:

STRESS: AXIAL, NORMAL, IN-PLANE, TENSILE, COMPRESSIVE, SHEAR, UNIFORM, NON-UNIFORM, SIMPLE SHEAR, COMPLEMENTARY SHEAR.

STRAIN: LINEAR, SHEAR, TRANSVERSE; POISSON'S RATION.

ELASTICITY: ELASTIC, HOMOGENEOUS, INSOTROPIC. STRESS – STRAIN CHARACTERISTICS OF M.S. SPECIMEN UNDER AXIAL TENSION. ELASTIC CONSTANTS AND DTHEIR RELATIONS. STRESSES IN COMPOSITE SECTIONS. TEMPERATURE STRESSES.

10. MECHANICAL PROPERTIES OF MATERIALS:

METALS: DUCTILITY, BRITTIENESS, TOUGHNESS, MALLEABILITY; BEHAVIOUR OF FERROUS AND NON-FERROUS METALS IN TENSION, COMPRESSION SHEAR AND BENDING TESTS, STANDARD TEST PIECES, INFLUENCE OF VARIOUS PARAMETERS ON TEST RESULTS; HOOKE'S LAW, ULTIMATE STRENGTH, LIMITS OF ELASTICITY AND PROPORIONALITY, YIELD LIMIT, PROOF STRESS; FACTOR OF SAFETY, WORKING STRESS, LOAD FACTOR, TRUE AND NOMINAL STRESS, MODES OF FRACTURE, CHARACTERISTIC STRESS-STRAIN CURVES, STRAIN HARDENING, HARDNESS, DIFFERENT METHODS OF MEASUREMENT, CREEP OF METALS; CO-RELATION BETWEEN DIFFERENT PROPERTIES, EFFECT OF TEMPERATURE; TESTINGT MACHINES AND SPECIAL FEATURES; DIFFERENT TYPES OF EXTENSOMETERS AND COMPRESSOMTERS. TIMBER-TESTS AND STRENGTH PARALLEL AND ACROSS THE GRAINS.

11. PRINCIPAL STRESS AND STRAINS:

COMPOUND STRESSES, ANALYSIS OF PRINCIPAL PLANES AND PRINCIPAL STRESSES, MOHR'S CIRCLE OF STRESS, PRINCIPAL STRAINS, ANGLE OF OBLIQUITYU OF RESULTANT STRESSES.

TERM WORK: TERM WORK SHALL CONSIST OF

[A] AT LEAST EIGHT EXPERIMENTS AND

[B] SOLUTION OF ATLEAST THREE PROBLEMS FROM EACH TOPIC SUBJECT TO A MINIMUM OF 25.

BHAVNAGAR UNIVERSITY
B.E. FIRST YEAR(IC/EC/IT/ELECT)

IEI-105 ELEMENTS OF ELECTRICAL ENGINEERING

Teaching scheme			Examination scheme				Total Marks
Theory Hours	Tut. Hours	Pract. Hours	Theory		Pra/Oral Marks	T/W Marks	
			Marks	Hours			
2	0	1	100	3	25	25	150

1. ELECTRIC CURRENT & OHM'S LAW:

Electron drift velocity - Charge Velocity and Velocity of Field Propagation - The idea of Electric Potential - Resistance - Unit of Resistance - Law of Resistance - Unit of Resistivity - Conductance & Conductivity - Effect of temp on Resistance - Temp. Coefficient of Resistance - Value of alpha at diff. temp. - Variation of receptivity with temp. - Ohm's Law - Resistance in series - Voltage Divider rule - Resistance in Parallel - Types of Resister - Nonlinear Resistance - Short & Open circuit - 'Shorts' in series & parallel circuit - "Opens" in series & parallel circuit - Division of current in parallel circuits - Equivalent Resistance - Duality between series & parallel circuit - Relative Potential - Voltage Divider Circuits - Objective tests

2. WORK, POWER & ENERGY:

Heating effect of electric current - Jules's law of electric heating - Thermal Efficiency of Absolute and gravitational units

3. CAPACITANCE:

Capacitor - Capacitance - Units - Capacitance of Isolated sphere - Spherical Capacitor - Parallel plate capacitor - Special cases of Parallel plate capacitor - Capacitor between two parallel Wire - Capacitor in series & Parallel - Energy stored in capacitor - Force of attraction between oppositely charged plates - charging of capacitor - Time constant - Discharging of capacitor

4. MAGNETISM & ELECTROMAGNETISM:

Absolute and relative permeability of a medium - Law's of Magnetic Force - Field Strength - Magnetic Potential - Flux per Unit pole - Flux Density - Magnetic induction - Intensity of magnetization - susceptibility - Relation between B, H, I - Boundary conditions - Weber & Ewing's molecular theory of magnetism - Curie point - Magnetic Circuit - Definition concerning magnetic circuit - Composite series magnetic circuit - Comparison & Difference between magnetic & Electric circuit - Parallel Magnetic Circuit - Series Parallel Magnetic circuits

5. ELECTROMAGNETIC INDUCTION:

Relation between magnetism & electricity - Production of induced E.M.F. & Current - Faraday's Laws of Electromagnetic induction - Direction of induced e.m.f. & current - Induced e.m.f.: Dynamically induced e.m.f., Statically induced e.m.f.- Self induction - Coefficient of Mutual induction - Coefficient of coupling -Inductances in series & parallel

6. MAGNETIC HYSTERESIS:

Magnetic hysteresis - Area of hysteresis loop - Steinmetz Law - Energy stored in magnetic field - Energy stored per unit Volume - Rise of current in inductive circuit - Decay of current in inductive circuit Time constant

7. A.C FUNDAMENTALS:

Generation of alternating voltages and currents -Equations of alternating voltages and currents- Definition of cycle, time period, frequency, Amplitude-Different forms of e.m.f .equation-Phase difference-R.M.S value for half wave rectified A.C -Average value-Form factor-A.C through R,C,L.

8. SERIES A.C CIRCUITS:

A.C through resistance & Inductance -Power Factor-Active and reactive components of circuit currents -Q factor of a coil - Dielectric loss and p.f. of capacitor - R-L-C circuit - Resonance in R-L-C circuit - resonance curve - Q factor of a series circuit

9. PARALLEL A.C. CIRCUITS:

Solution of parallel RL, RC & RLC vector or phasor method - Admittance method - Application of admittance method - Phasor algebra - Series parallel circuits - series equivalent of parallel circuit - parallel equivalent of series circuit - Resonance in parallel circuit - Q factor of a parallel circuit.

10. POLYPHASE CIRCUITS:

Generation of poly phase voltages -phase sequences - numbering of phases – interconnection of three phases - star or Y connection and delta or mesh connections - voltage, current (line and phase) and power for three phase star and delta connected system .

PRACTICAL/ ORAL:

The practicals and termwork shall be based on the course under Elements of Electrical Engg. as above.About eight practicals should be performed in the laboratory.

TEXT BOOK:

1. ELECTRICAL TECHNOLOGY-Volume-I by B.L. THERAJA , A.K. THERAJA

REF. BOOKS

1. BASIC ELECTRICAL ENGINEERING - V.N. MITTAL
2. ELECTRICAL ENGINEERING PRINCIPLES - ASHFAK HUSAIN

BHAVNAGAR UNIVERSITY
B.E. FIRST YEAR(IC/EC/IT/ELECT)

IEI-106 BASIC ELECTRONICS

Teaching scheme			Examination scheme				Total Marks
Theory Hours	Tut. Hours	Pract. Hours	Theory		Pra/Oral Marks	T/W Marks	
			Marks	Hours			
2	0	1	100	3	25	25	150

1. DIODE CIRCUITS:

Brief review of semiconductors and diode theory, Half -wave rectifier , Full -wave rectifier , Bridge rectifier, Filter circuits, Surge current , Voltage multipliers, limiter and clamper, Peak to peak detector.

2. SPECIAL PURPOSE DIODE:

Construction, Characteristics and application of Zener diode, LED, Photodiode, Schottky diode, Varactor diode, Tunnel diode, Step - recovery diode.

3. TRANSISTOR FUNDAMENTALS:

Bipolar transistor, unbiased transistor, biased transistor, Transistor currents, CE,CB,CC connection, Characteristic curves, Relation between alpha & beta, Cut-off & breakdown, The Ebers- moll model, variation in current gain, The load line and operating point , saturation, The transistor switch, phototransistors, opto coupler.

4. TRANSISTOR BIASING:

Voltage divider bias and its analysis, Load line and Q point , Emitter feedback bias, collector feedback bias, Two supply emitter bias.

5. TRANSISTOR AMPLIFIERS:

Coupling capacitor, Bypass capacitor, DC & AC equivalent circuits, Small signal operation, AC model of a CE amplifier, H parameters.

6. VOLTAGE AMPLIFIERS

Circuit and analysis of CE, CB and CC amplifier, swamped amplifier, Cascade Stages, Darlington transistor

7. POWER AMPLIFIERS:

The AC load line , Class A operation, Class B operation, Class C operation, Transistor power rating, AC Saturation and cut-off, AC output , Biasing class A and Class B amplifiers , Class B Drivers, Output impedance

8. FIELD EFFECT TRANSISTORS:

Construction characteristics and application of JFET & MOSFET

9. OSCILLATORS:

Theory of sinusoidal oscillator, The Wien bridge osci. , Colpitts osci., Phase shift Osci., Hartley Osci.,Clapp Osci., Crystal Osci., Quartz Crystals.

BOOKS

- | | |
|-------------------------------------|------------------------------|
| 1. ELECTRONIC PRINCIPLES | -BY A.P. MALVINO (TEXT BOOK) |
| 2. BASIC ELECTRONICS | -BY B.L. THERAJA |
| 3. INTEGRATED ELECTRONICS | -BY MILLMEN & HALKIAS |
| 4. PRINCIPLE OF ELECTRONICS | -BY V K MEHTA |
| 5. ELECTRONICS DEVICES AND CIRCUITS | -BY MOTTERSLED |

BHAVNAGAR UNIVERSITY
B.E. FIRST YEAR(IC/EC/IT)

IEI-107 ENGINEERING GRAPHICS

Teaching scheme			Examination scheme				Total Marks
Theory Hours	Tut. Hours	Pract. Hours	Theory		Pra/Oral Marks	T/W Marks	
			Marks	Hours			
2	0	2	100	4	25	25	150

(A) PLANE GEOMETRY AND MACHINE PARTS

1. Introduction to Engineering Graphics:

Principles of projection lines and dimensioning B.I.S. Code of practice (SP - 46) Scale, Representative fraction, plane scale vernier scale. And scale of chords.

2. ENGINEERING CURVES:

Classification and construction of engineering curves such as conics, cycloidal curves, involute, spirals.

3. LOCI OF POINTS:

Loci of points on simple Mechanism like slider crank Mechanism, four bar chain Mechanism etc.

4. FASTENING AND JOINING METHODS:

Screw threads, bolts nut stud, locking devices simple riveted and welded joints, couplings, bearings, cotter joints, pin joints,

(B) SOLID GEOMETRY:

5. INTRODUCTION TO PROJECTION OF POINT, LINE AND PLANE:

Projection of line inclined to both planes & simple cases, True length of straight line and its inclination with reference planes (traces are not included) Projections of planes on Principle and auxiliary planes.

6. Introduction to Projection of Solids, Section of Solids and Inter Penetration of Solid:

Classification of solid projection of right and regular solids with their axis inclined to both planes, projection of sphere section of pyramid, cone, prism and cylinder, methods of determining line of intersection and curve of intersection. Intersection of prism to prism, cone to cylinder to cylinder, cylinder to cone, cylinder to prism.

7. DEVELOPMENT OF SURFACES:

Parallel line development, radial line development and development of sphere.

TERMWORK:

PART P AND B THE FOLLOWING TO BE PREPARED ON A SIZE DRAWING SHEET IN THE DRAWING HALLS OF THE COLLEGE WITH SKETCH BOOK

1 Loci of points 2 engineering curves 3 projection of point line and planes, 4 projection of solids and section of solids 5 development of surfaces and interpenetrating of surfaces. 6 isometric projection/views. Sketch book of m/c parts, pipe drawing lines, dimensioning scale etc/

PRACTICAL /ORAL

The practical and termwork shall be based on syllabus.

Book:

1. Engineering drawing vol I and II by P. J. Shah
2. Engineering drawing by N. D. Bhatt
3. Machine drawing by N. D. bhatt

BHAVNAGAR UNIVERSITY
B.E. FIRST YEAR(IC/EC/IT)

IEI-108 ELEMENTS OF MECHANICAL ENGINEERING

Teaching scheme			Examination scheme				Total Marks
Theory Hours	Tut. Hours	Pract. Hours	Theory		Pra/Oral Marks	T/W Marks	
			Marks	Hours			
2	0	1	100	3	25	25	150

(A) THEORY :

- 1. Definition of system,** surroundings, thermal equilibrium, expansion work, first law of thermodynamics, perpetual motion of the first order, internal energy, flow & non flow processes general energy equation for steady flow non-flow energy equation & their applications in various processes.
- 2. Properties of Gas:** Expansion & compression of gas, point & Path functions, various process. Like constant volume, constant pressure Isothermal adiabatic and Polytropic and throttling etc.
- 3. Properties of Steam:** Difference between gas and vapors, phase diagram, Effect of pressure on the boiling point of water, Generation of steam, conditions of steam, Properties of steam, Use of steam tables, Internal energy of steam, Methods of determination of dryness fraction of steam.
- 4. Steam Boilers and Performance of Boilers:** Function classification, terms used, study of Lancashire, Locomotive, Cochran & Babcock & Wilcox boilers, Equivalent evaporation, Boiler efficiency, Boiler power.
- 5. Boiler Mountings & Accessories:** Boiler mountings, safety valves, water level indicators, pressure gauge, steam stop valve, Feed check valve, Blow off cock, manhole Fusible plug. Economizer. Air pre heater, Super heaters, Feed pumps, Injectors.
- 6. Draught Definition,** classification, Function of chimney Natural draught, height of chimney, condition for maximum discharge through chimney, efficiency, Draught losses, Artificial draught, Advantages of Mech. Draught. Forced and balanced draught, draught gauges.
- 7. Steam Engines:** Classification, parts of a simple steam engine and its function, working of a steam engine, Hypothetical indicator diagram, m. e. P., diagram factor, Theoretical power and its measurement.
- 8. Introduction of heat and mass transfer:** Basic equations for conduction convection, radiation, their applications to simple problems.
- 9. Fuels:** Classification, calorific values and its determination, experimental determination, combustion of a fuel, minimum quantity of air required, excess air, determination of the flue gas analysis by weight and volume, complete combustion of fuel air/fuel ratio.
- 10. I.E.Engines:** Classification, construction, four and two stroke engines, its comparison, Otto cycle, diesel & dual cycle, their efficiency and m.e.p., & power, petrol engine, diesel engine, valve timing diagram, governing of I.C. engine, methods of starting of T.C. Engines.

(B) PRACTICAL/ORAL:

The practical work shall consist of laboratory study work/experimental work on the topics mentioned under theory.

(C) TERM WORK:

The term work shall consist of laboratory study work, experimental work done under practical and shall be written and submitted in the form of report/journal.

(D) REFERENCE BOOK:

- Heat Engines by Pandya & Shah.
- Heat Engineering by Ballaney.
- Thermal Engineering by Sarao.
- Heat Engines by Patel & Karamchandani
- Engineering Thermodynamics by Gupta & Prakash.
- Thermodynamics & Heat by Mathur & Mehta Power Engg. Vol-I.

BHAVNAGAR UNIVERSITY
B.E. FIRST YEAR(IC/EC/IT/ELECT)

IEI-109 MODERN WORKSHOP PRACTICE

Teaching scheme			Examination scheme				Total Marks
Theory Hours	Tut. Hours	Pract. Hours	Theory		Pra/Oral Marks	T/W Marks	
0	0	2	Marks	Hours	50	50	
			0	0			100

PART A:

1. Carpentry:

The modern workshop practice shall consists of study of timber classification, seasoning and preserving, defects in timber, study of plywood, hardwood, marionette, glues, varnishes and polishes.

2. Fitting:

Study of nature of work done in a fitting shop, fitting tools and their uses, simple exercises involving cutting, fitting, drilling and taping operations.

3. Welding and sheet metal shop:

Study of nature of work done in welding and sheet metal shop, tools and equipment's used in welding and sheet metal shop, study of manual metal are and gas welding, joint preparation, Simple exercises in are welding and gas welding, simple exercise involving development of surfaces of sheet metal working processes.

NOTE:

Study shall contain above mentioned topics in details and is should be submitted as part of term work.

Jobs mentioned below shall be done as practical work for hand on skill development.

The above term work shall be done as practical work for hand on skill development.

- | | |
|---------------------|-------|
| 1. carpentry | 1 job |
| 2. fitting | 1 job |
| 3. welding | 1 job |
| 4. sheet metal shop | 1 job |

Books:

1. Workshop Technology vol- I,II,III by W.A.J. CHAMPMAN
2. SENIOR WORKSHOP CALCULATIONS BY W.A.J. CHAPPMAN;,E.L.B.S.LONDON
3. WORKSHOP TECHNOOGY VOL_I AND II BY HAYARA CHAUDHARY

PART B:

1. Study and identification of electronic components such as resistors, capacitors, inductors. AF and RF transformers, coils, relays switches, PCB connectors, LED, LCD displays etc.
2. Testing and identification of electronic devices such as PN junctions, transistors, FETs, MOSFETs, UJT, SCRs, diacs, Triacs, bridge rectifiers, TTL & MOS ICs, operational Amplifiers etc.
3. Use of data books, specification and commercial identification of components and devices.
4. Soldering and de-soldering practice.
5. Use of breadboard and general purpose PCBs.
6. Study of different types of conductors, cables, connectors e.g. solid wired, standard wire, co-axial cable, lugs and clips, terminal strips, phone plug, TV-VCR connectors, fuses such as gloss cartridge fuses etc.
7. study of PCB design techniques and process.
8. Study of house wiring and energy meter connection. Different types of domestic and industrial wiring methods
9. Working understanding of various measurements devices like dc power supply, function generators, various types of CRO.

PRACTICAL/ORAL: tutorial and term work shall be based on above syllabus.

IMPORTANT NOTE:

- ♣ The Two Hours / Week of Workshop should be divide equally for each part and each part weighted should be 50 Marks
- ♣ The Laboratory of each part should be taken alternate.