ASSAM SCIENCE AND TECHNOLOGY UNIVERSITY

GUWAHATI

SYLLABUS FOR SECOND SEMESTER BTech

Syllabus and Course Structure for the Second Semester for B.Tech Programme

SECOND SEMESTER (JANUARY-JUNE)

Sl No	Sub Code	Subject	Hrs			Credits
			L	T	P	C
	Theory					
1	MA131201	Mathematics-II	3	0	0	3
2	PH131202	Physics-II	2	2	0	3
3	CY131203	Chemistry-II	2	2	0	3
4	ET131204	Basic Electrical & Electronics Engineering - II	2	2	0	3
5	ME131205	Basic Mechanical Engineering	3	0	0	3
6	CE131206	Basic Civil Engineering	3	0	0	3
7	HS131207	Environmental Science	2	0	0	2
	Practical					
8	PH131212	Physics- II Lab	0	0	2	1
9	CY131213	Chemistry- II Lab	0	0	2	1
10	ET131214	Basic Electrical & Electronics Engineering – II Lab	0	0	2	1
11	ME131215	Basic Mechanical Engineering Lab	0	0	2	1
13	ME131218/ EE131218	Work shop	0	0	2	1
			17	6	10	25
Total Contact Hours = 33						
Total Credits = 25						

Subject Code : MA131201
Subject: Mathematics - II

L-T-P: 3-0-0 **Credit 3**

Expected Weeks :12

Modules	Topics	Course Content	Hours
I	**LINEAR ALGEBRA**	**A.Linear Algebra 1:** (i) Recapitulation of Matrix theory, Elementary transformations, Reduction of the given matrix to echelon and normal forms (ii) Rank of a matrix, Consistency of a system of linear equations and solution Solution of a system of linear homogeneous equations (trivial and non-trivial solutions) (iii) Solution of a system of non-homogeneous equations by Gauss elimination and Gauss – Jordan methods **B.Linear Algebra 2:** (i) Vector Space and subspace (Definition and example only),Basis and dimension, Row rank and column rank, Equality of rank (ii) Inner product and inner product space, Orthogonal and orthonormal vectors,Orthogonalisation of vectors(Gram-Schimdt method), (iii) Eigen values and eigen vectors of a matrix(for dimension 2 and 3),Caley-Hamilton theorem, Diagonalisation, Reduction of matrix to diagonal form, necessary and sufficient condition for diagonalisation**.**	18
II	**VECTOR ALGEBRA AND CALCULUS**	**A.Vector Algebra**: (i) Scalar and vector triple products and related problems. (ii) Equation of straight line, Plane and sphere. B.**Vector calculus**: (i) Vector function of a scalar variable. (ii) Differentiation of a vector function. (iii) Scalar and vector point functions. (iv) Gradient of a scalar point function. (v) Directional derivative and related problems. (vi) Divergence and curl of a vector point function. (vii) Idea of line, Surface and volume integrals. (viii) Green's theorem. (ix) Gauss' Divergence Theorem and (x) Stokes' theorem (Statements and applications).	12
III	**FOURIER SERIES**	**Fourier series:** (i) Even and Odd function, (ii) Eulers formula, (iii) Fourier series expansion of $f(x)\ in\ \ c < x < c + 2\pi$, (iv) Dirichlet's conditions, (v) Fourier series for discontinuous functions, change of intervals, half range series.	6
		Total	36

Text Books/Reference Books:

1. Advanced Engineering Mathematics by Erwin Kreyszig (Wiley Eastern Ltd.).
2. Higher Engineering Mathematics by B. S. Grewal (Khanna Publication, Delhi).
3. Engineering Mathematics, Wylie C.R. & Barrett L.C. (McGraw-Hill, Inc.)
4. Engineering Mathematics(part I and part II), Babu –Ram (Pearson).
5. Vector Calculus- Shantinarayan, S.Chand & Co.
6. A Text book of Vector algebra by Shanti Narayan: S. Chand & Co.
7. Higher Engineering Mathematics by Bandaru Venkata Ramana, Tata McGraw - Hill Education.
8. Schaum's outline of Linear Algebra.

Subject Code : PH 131202
Subject: Physics-II

L-T-P: 2-2-0 **Credit 3**

Expected Weeks : 12

Modules	Topics	Course Content	Hours
I	**X-RAYS**	Production and Properties of X-rays, Hard X-rays and Soft X-rays, Continuous and Characteristic X-rays Spectrum, Origin of X-rays, Difference between X-ray spectra and Optical spectra, Moseley's Law.	4
II	**ACOUSTICS AND ULTRASONICS**	Weber Fechner law, Units of Loudness- Decibel, Phone, Sone, Absorption coefficient, Reverberation, Reverberation time, Sabine's formula for reverberation time (Derivation not required), Factors affecting acoustics of buildings and their remedies, Design of a Good Acoustical Building Properties of ultrasonic waves, Ultrasonic production (Magnetostriction and Piezoelectric method), Applications of Ultrasonics.	9
III	**LASER AND FIBRE OPTICS**	Induced absorption, Spontaneous and Stimulated emission, Einstein's coefficients (A & B), Population Inversion, Pumping, Principle of Laser, Characteristics of a laser beam, Ruby and Semiconductor Laser, Application of Lasers. Optical fibre- Principles and Structure, Propagation of light in optical fibres, Numerical aperture and acceptance angle, Classification of optical fibres- Single and Multimode, Step Index and Graded Index fibres, Losses in fibres, Optical fibre communication system (Block diagram only).	7
IV	**QUANTUM MECHANICS**	De-Broglie hypothesis (concept of group velocity and phase velocity), Expression for de-Broglie wavelength in terms of group velocity and phase velocity, Davisson and Germer Experiment, Heisenberg's Uncertainty principle and its applications.	6
V	**SOLID STATE ELECTRONICS AND SUPERCONDUCTIVITY**	P-N Junction Diode, Biasing of P-N Junction Diode & its I-V Characteristics, Breakdown of a P-N Junction Diode (Avalanche and Zener breakdown), Junction Capacitance, Hall Effect, Determination of Hall Coefficient, Bipolar Junction Transistor, Transistor Connections, Constants of a Transistor, Common-Emitter Transistor Amplifier. Physical Properties of Conventional Superconductors (Meissner Effect, Critical Magnetic Field, Isotope Effect, Persistent Current, Magnetic Levitation), Type-I and Type-II Superconductors and their comparison, BCS theory of Superconductivity (Qualitative only).	10
Total			36

Text Books and Reference Books:

1. Applied Physics for Engineers, Neeraj Mehta, PHI Learning Private Limited, New Delhi
2. Detailed Text Book of Engineering Physics, S.P. Basavaraju, Subhas Publication Subhas Stores, Bangalore.
3. Fundamentals of Physics - Jearl Walker, Published by Wiley India Private Limited, ISBN: 978-81-265-1442-7.
4. Elements of Properties of Matter, D.S. Mathur. Publisher: S. Chand.

Subject Code : CY131203
Subject: Chemistry – II

L-T-P: 2-2-0 **Credit 3**
Expected Weeks :12

Modules	Topics	Course Content	Hours
I	**CRYSTAL STRUCTURE**	Crystalline solids and crystal structure. Plane and space lattice. Unit cell. Types of Bravais lattice. Crystal planes and Miller index. X-ray diffraction and Bragg's law. Powder method. Indexing powder diffraction pattern for cubic and tetragonal crystals	4
II	**STRUCTURE OF INORGANIC SOLIDS**	Ionic bonding in solids and lattice energy. Born-Lande equation of lattice energy. Close packing of atoms and packing efficiency. Structure of metals and alloys. Octahedral and tetrahedral holes. Radius ratio rules.	4
III	**FUELS**	Soild fuels with emphasis on coal; domestic and metallurgical coke. Calorific value and its determination; Dulong's formula for GCV and LCV. Liquid fuel with emphasis on petroleum; processing of petroleum crude; Octane and Cetane numbers; reforming of straight run gasoline; cracking. Types of cracking. Non-conventional sources of energy: solar, wind and nuclear energy.	4
IV	**LIQUID CRYSTALS**	**Mesomorphic phases**: thermotropic and lyotropic; smectic, nemetic and cholesteric liquid crystals. Use of liquid crystals.	4
V	**REFRACTORY MATERIAL**	Preparation of refractory materials; Classification into acidic, basic and neutral refractories and their uses	2
VI	**POINT DEFECTS IN SOLIDS**	Point defects in metals and ionic crystals (vacancy, interstitial, impurity and valence defects, Frenkel and Schottky defects, F centre). **Electrical property** Electrical property of solids. Fermi energy. The concept of hole. Metals, insulators and semiconductors. *n*- and *p*-type semiconductors. Photovoltaic cell. Elemental semiconductors; III-V and II-VI semiconductors.	4
VII	**POLYMER**	Monomer, oligomer and polymer. Types of polymerization. Methods of polymerization. Molecular weight of polymers. Structure and properties of polymers. Natural polymers. Important thermosetting polymers: cellulose derivatives, polythene, **PVC, PTFE, PMMA**, polystyrene, polycarbonate, polyamide and phenolic resins. Speciality polymers: silicones, conducting polymers and biodegradable polymers.	5
VIII	**NANOMATERIAL**	Introduction, differences from other materials, Properties of nanomaterials, one, two and 3D nanomaterials, preparation of nanomaterials (top down and bottom up approach), applications of nanomaterials, carbon nanotubes.	2
IX	**COMPOSITE MATERIALS**	Composites and their constituents; Classification: particle reinforced composites, fiber reinforced composites and properties; Metal matrix, ceramic matrix and polymer matrix composites	3
X	**CEMENT**	**Portland cement:** raw materials, manufacture. Different types of Portland cement; chemical reaction during	2

		formation of cement and in hardening of cement.	
XI	**LUBRICANTS**	Mechanism of lubrication, liquid lubricants and their properties, grease; solid lubricants	2
Total			36

Text/Reference Books

1. H. V. Keer, PRINCIPLES OF THE SOLID STATE, New Age International, New Delhi, 1993.
2. D. K. Chakrabarty, SOLID STATE CHEMISTRY, (second edition), New Age International, New Delhi, 2009.
3. B. Sivasankaar, ENGINEERING CHEMISTRY, Tata McGraw-Hill, New Delhi, 2008.
4. R. Bapna and R. Gupta, ENGINEERING CHEMISTRY, Macmillan India (2010)

Subject Code : ET131204

Subject: Basic Electrical and Electronics Engineering - II

L-T-P: 2-2-0 **Credit 3**

Expected Weeks :12

Modules	Topics	Course Content	Hours
I	**FUNDAMENTALS OF DC MACHINES**	i) Basic constructional Features, types, elementary idea of DC machine winding, EMF equations, characteristics of DC generators, OCC and the load characteristics,	3
		ii) Working principle of DC motor, back emf, speed equation, speed control.	3
II	**TRANSFORMER**	i) Theory of an ideal transformer, iron core transformer, EMF equation, voltage, current and transformation ratio,	3
		ii) Losses and efficiency of a transformer,	2
		iii) Condition for maximum efficiency, all - day efficiency, voltage regulation.	3
III	**A.C. SYNCHRONOUS MACHINES**	i) Constructional features, EMF equation, rotating mmf.	2
		ii) Principle of operation of synchronous motor,	2
		iii) Applications	
IV	**INDUCTION MOTOR**	i) Constructional features of three phase induction motors, working principle, concept of slip	3
		ii) Introduction to single phase induction motor, types, applications.	3
V	**ANALOG ELECTRONICS**	Introduction to transistors, types, CE,CB,CE-configuration, concept of α and β, and their relationship, characteristics of CE transistor, cut-off, saturation and active mode, concept of DC operating point. Preliminary ideas on Operational Amplifier.	6
VI	**DIGITAL ELECTRONICS**	Number system and codes, Decimal and binary numbers, conversion of decimal to binary and vice versa, Basic building blocks in digital electronics, NOT, AND,OR, NAND, NOR, XOR ,X-NOR, Boolean algebra, D'Morgan's theorem, combinational circuit, truth table, realization using gates	6
Total			36

Reference Books:

1. Basic Electrical and Electronics Engineering- -**S.K Bhattacharya**
2. Basic Electrical and Electronics Engineering- -**Sukheja and Nagsarkar**
3. Basic Electrical Engineering-**R.S Ananda Murthy.**
4. Basic Electronics-**Debashish De**
5. Foundation of Electronics-**J.R Cogdell**

Subject Code : ME131205
Subject: Basic Mechanical Engineering

L-T-P: 3-0-0 **Credit 3**
Expected Weeks :12

Modules	Topics	Course Content	Hours
I	**THERMODYNAMICS**	System, properties, different Processes, work done during the process, Statement of Laws of Thermodynamics, Carnot, Reversed Carnot, Otto and Diesel Cycles – air standard efficiency (No derivations). Simple problems on air standard efficiency.	6
II	**PROPERTIES OF STEAM**	Formation of steam at constant pressure, Thermodynamic properties of steam, Condition of steam, Classification of boilers, mounting and accessories.	7
	ENERGY CONVERSION DEVICES	Working principles and applications of Turbines - Steam turbines, Gas turbines, Hydraulic turbines, I.C. engines, household refrigerator.	
III	**HEAT TRANSFER**	Definition of heat transfer, modes of heat transfer, Fourier's law. Insulating materials and their properties.	3
IV	**FLUID MECHANICS**	Properties of Fluids: Pressure or intensity of Pressure, Mass Density or Density or Specific Mass, Weight Density or Specific Weight, Specific Volume, Specific Gravity. **Viscosity**: Newton's Law of Viscosity, Kinematic Viscosity.	3
V	**ENGINEERING MECHANICS**	Force, Moment and Couple, Free body diagrams, General equations of equilibrium, Friction, Center of gravity and moment of inertia, Simple problems on CG, MI and Friction- simple definitions, Law of friction (inclined plane only)	7
VI	**SIMPLE MACHINES**	Definition of machine, Velocity ratio, Mechanical advantage, Efficiency, Laws of machines, Reversibility of machine, Simple problems	6
	POWER TRANSMISSION	Simple systems of belt drives and gear drives.	
VII	**MANUFACTURING PROCESS**	Description of Die casting, forging and welding	4
		Total	36

Text Book/ Reference Books:

1. Basic Mechanical Engineering, T.S. Rajan, New Age International
2. Basic Mechanical Engineering, C.M. Agrawal, Basant Agrawal, Wiley India Private Limited
3. Theory of Machines, S.S. Rattan, Tata McGraw – Hill
4. Engineering Mechanics , Timoshenko & Young, Tata McGraw – Hill
5. Fluid Mechanics, R.K. Bansal, Laxmi Publications
6. Thermodynamics, P.K. Nag, Tata McGraw – Hill
7. Power Plant Engineering, P.K. Nag, Tata McGraw – Hill.
8. Workshop Technology, B S Raghuwanshi, Dhanpat Rai and Company (P) Limited

Subject Code : CE131206

Subject: Basic Civil Engineering

L-T-P: 3-0-0 **Credit 3**

Expected Weeks: 12

Modules	Topics	Course Content	Hours
1	**AN INTRODUCTION TO CIVIL ENGINEERING**	Developments in Civil Engineering; Importance of Civil Engineering; Branches in Civil Engineering (Surveying, Building, Transportation, Geotechnical, Hydraulics, Hydrology, Environmental etc).	2
2	**BUILDING MATERIALS**	Bricks; Types of Bricks; Classification of Bricks- First Class, Second Class, Third Class and Fourth Class Brick; Characteristics of Good Brick; Calculation of number of bricks for a given area; Rocks; Classification of Rocks- geological, chemical and structural; Quarrying of Rocks- without blasting and by blasting; Cement; Chemical Composition of Cement; Mortar; Concrete; Difference between Mortar and Concrete, Cement as stabilizer.	8
3	**STRENGTH OF MATERIALS**	Simple Stress and Strain;Types of stress and strain- Tensile, Compressive, Shear and Bending; Hook's Law; Young's Modulus; Simple Problems on Young's Modulus; Introduction to Beams and Columns; Types of Beams.	7
4	**ENGINEERING SURVEY**	Surveying; Classification of Surveying- Plane and Geodetic; Principle of Surveying; Methods of Chaining; Errors in Chaining; Chain and Tape Correction; Types of Compass Traversing- Closed and Open; Problems on WCB and QB, FB and BB; Local Attraction; Datum, R.L., Bench Mark, FS and BS, HI, Change Point; Methods of Calculation of RL- Height of instrument system, Rise and Fall Method; Total Station; Photogrammetry; Remote Sensing.	10
5	**HIGHWAY ENGINEERING**	Classification of highways based on location and function; Ideal cross-section of highway and related terms with sketches.	3
6	**ENERGY EFFICIENT BUILDING**	Basic concept, Safety measures of building against fire, earthquake, electricity	3
7	**SOIL MECHANICS**	Introduction to Soil Mechanics; Soil formation and soil types- Residual and Transported; Civil engineering problems related to soil.	3
	Total hours		**36**

Recommended Books:

1. Building Materials by Rangwala; Charotar Publishing House.
2. Surveying and Levelling by N NBasak; Tata McGraw Hill.
3. Strength of Materials by Dr. R.K. Bansal; Laxmi Publication.
4. Highway Engineering by Rangwala; Charotar Publishing House

Subject Code : HS131207
Subject: Environmental Science

L-T-P: 2-0-0 **Credit 2**

Expected Weeks :12

Modules	Topics	Course Content	Hours
I	**CONCEPTS OF ENVIRONMENTAL SCIENCES**	Environment, Levels of organizations in environment, Structure and functions in an ecosystem; Biosphere, its Origin and distribution on land, in water and in air, Broad nature of chemical composition of plants and animals	4
II	**NATURAL RESOURCES**	Renewable and Non-renewable Resources, Forests, water, minerals, Food and land (with example of one case study); Energy, Growing energy needs, energy sources (conventional and alternative)	4
III	**BIODIVERSITY AND ITS CONSERVATION**	Biodiversity at global, national and local levels; India as a mega-diversity nation; Threats to biodiversity (biotic, abiotic stresses), and strategies for conservation	4
IV	**ENVIRONMENTAL POLLUTION**	Types of pollution- Air, water (including urban, rural, marine), soil, noise, thermal, nuclear; Pollution prevention; Management of pollution – Rural /Urban/Industrial waste management [with case study of any one type, e.g., power (thermal/nuclear), fertilizer, tannin, leather, chemical, sugar], Solid/Liquid waste management, disaster management	6
V	**SOCIAL ISSUES AND ENVIRONMENT**	Problems relating to urban environment- Population pressure, water scarcity, industrialization; remedial measures Climate change- Reasons, effects (global warming, ozone layer depletion, acid rain) with one case study; Legal issues- Environmental legislation (Acts and issues involved), Environmental ethics; Environmental Monitoring covering, Monitoring-Identification of environmental	6
Total			24

Text/Reference Books:

1. Agarwal, K.C., Environmental Biology, Nidi Publication Ltd., Bikaner, 2001.
2. Bharucha Erach, Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmadabad, 2002.
3. Dr R J Ranjit Daniels. And Dr Jagadish Krishnaswamy.-- Environmental studies-2010-willey india.

Subject Code : PH131212
Subject: Physics-II Lab

L-T-P: 0-0-2 **Credit 1**

Expected Weeks :12

Experiment	Experiment Title	Lab Hour
I	To determine the mechanical equivalent of heat by Joules calorimeter	1
II	To determine the specific heat of the given liquid by the method of cooling	1
III	To measure the current flowing through an external circuit with the help of a potentiometer.	1
IV	To determine the grating element and number of lines per unit length of a given grating by spectrometer.	2
V	Determination of the value of a low resistance by the drop of potential method (by a meter-bridge).	1
VI	To determine the internal resistance of a cell with the help of a potentiometer.	1
VII	To draw the characteristics curves of semiconductor diode (p-n diode).	1
VIII	To draw the input and output characteristics curves of common emitter type of transistor (N-P-N).	1
IX	Investigation of a series resonant L-C-R circuit; To draw the resonance curve and to find out the Resonance Frequency (R_F). from R_F, find out the values of the unknown capacitances.	1
X	To determination of the focal length of a convex mirror with the help of an auxiliary lens.	1
XI	Revision of the Experiments and Internal Viva	1
Total		12

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Subject Code : CY131213
Subject: Chemistry-II Lab

L-T-P: 0-0-2 **Credit 1**

Expected Weeks :12

Experiment	Experiment Title	Lab Hour
I	To estimate the hardness of a given sample of water by using a standard solution of EDTA	1
II	To estimate the total quantity of Fe^{++} in a given solution by using a standard solution of $KMnO_4$.	1
III	To estimate the total quantity of Cu^{++} ions in a given solution by iodometric method.	1
IV	To prepare a complex compound, e.g. potassium trioxalato chromate (III).	1
V	To verify Onsager's equation and also to determine the equivalent conductance of a strong electrolyte (e.g KCI and HCI) at infinite dilution.	2
VI	To verify the Beer- Lambert's law and determine ferrous ions in a given solution spectrophotometrically	2
VII	To determine the strength of a given strong acid (e.g. HCI) pH- metrically by titrating against a strong base (e.g. NaOH).	2
VIII	Revision of the Experiments and Internal Viva	2
Total		12

Subject Code : ET131214

Subject: Basic Electrical and Electronics Engineering-II Lab

L-T-P: 0-0-2 **Credit 1**

Expected Weeks :12

Experiment	Experiment Title	Lab Hour
I	Open circuit characteristics (OCC) of a DC Generator.	1
II	Testing of a single phase transformer	1
III	Speed control of a DC shunt motor a) Armature control method b) Field control method	2
IV	Open circuit characteristics on a three phase alternator	1
V	Study of logic gates	1
VI	Realization of Boolean expression	1
VII	To study the operational amplifier circuit used as an inverting voltage amplifier	1
VIII	To study the output characteristics of a common emitter (CE) mode of a transistor as an amplifier.	2
IX	Demonstration on a) Starting method of a three-phase induction motor and b) Synchronous motor.	2
TOTAL		12

Subject Code : ME131215
Subject: Basic Mechanical Engineering Lab

L-T-P: 0-0-2 **Credit 1**

Expected Weeks :12

Experiment	Experiment Title	Lab Hour
I	Engineering Mechanics	
	1. Verification of Polygon Law of Forces	1
	2.Verification of Parallel Law of Forces	1
	3. Determination the co-efficient of friction	2
	4. Moment of Inertia of Flywheel	2
	5. Determination of forces in truss	2
II	Demonstration	
	1.Boiler - mounting and accessories	1
	2.I.C. Engines, Steam Engines	1
	3.Governors, Gears, Belt drives, brakes, clutches	1
III	Revision of the Experiments and Internal Viva	1
Total		12

Subject Code : ME131218
Subject: Workshop for CE and ME

L-T-P: 0-0-2 **Credit 1**
Expected Weeks :12

Experiment	Experiment Title	Lab Hour
I	**Carpentry Shop** • Timber, definition, engineering applications, seasoning and preservation • Plywood and ply boards **List of jobs:** 1. T – Lap joint 2. Bridle joint	1
II	**Foundry Shop** • Moulding Sands, constituents and characteristics • Pattern, definition, materials types, core prints • Role of gate, runner, riser, core and chaplets • Causes and remedies of some common casting defects like blow holes, cavities, inclusions. **List of jobs:** 1. Mould of any pattern 2. Casting of any simple pattern	1
III	**Welding Shop** • Definition of welding, brazing and soldering processes and their applications • Oxyacetylene gas welding process, equipment and techniques, types of flames and their applications • Manual metal arc welding technique and equipment, AC and DC welding • Electrodes: Constituents and functions of electrode coating, welding positions • Types of welded joints, common welding defects such as cracks, undercutting, slag inclusion and boring **List of jobs:** 1.Gas welding practice by students on mild steel flat 2.Lap joint by gas welding 3.MMA welding practice by students 4.Square butt joint by MMA welding 5.Lap joint by MMA welding 6. Demonstration of brazing	2
IV	**Fitting Shop :** Files, materials and classification. **List of job:** 1. Finishing of two sides of a square piece by filing.	2
V	**Smithy Shop** • Forging, forging principle, materials • Operations like drawing, upsetting, bending and forge welding • Use of forged parts **List of job:** 1Tin smithy for making mechanical joint and soldering of joint 2. To cut a square notch using hacksaw and to drill three holes on PCD and tapping	2
VI	**Computer Engineering Shop** • Hardware Shop **List of Jobs** 1.Disassemble and assemble the PC back to working condition; 2**:** Install MS windows and Linux on the personal computer and configure to dual boot the system; 3**:** Troubleshooting**:** Students to be given a PC which does not boot due to improper assembly or defective peripherals and system software problems. To identify the problem and fix it to get the PC back to working condition • Software Shop	3

	List of Jobs 4: Students to get connected to their Local Area Network and access the Internet. In the process to configure the TCP/IP setting, access the websites and email; Job 5: Productivity Tools- Use Office Tools Word, Excel for creating Scheduler, Calculating GPA, basic Power Point utilities and tools which help to create basic Power Point Presentation as well as interactive Presentation using Hyperlinks, Inserting –Images, Clip Art, Audio, Video, Objects, Tables and Charts.	
VIII	Revision of the Experiments and Internal Viva	1
Total		12

Subject Code : EE131218
Subject: Workshop for EE,EEE,ECE,AEI, CSE,IT etc

L-T-P: 0-0-2 **Credit 1**
Expected Weeks :12

Experiment	Experiment Title	Lab Hour
I	**Welding Shop** • Definition of welding, brazing and soldering processes and their applications • Oxyacetylene gas welding process, equipment and techniques, types of flames and their applications • Manual metal arc welding technique and equipment, AC and DC welding • Electrodes: Constituents and functions of electrode coating, welding positions • Types of welded joints, common welding defects such as cracks, undercutting, slag inclusion and boring **List of jobs:** 1.Gas welding practice by students on mild steel flat 2.Lap joint by gas welding 3.MMA welding practice by students 4.Square butt joint by MMA welding 5.Lap joint by MMA welding 6. Demonstration of brazing	2
II	**Electrical & Electronics Engineering Shop** **List of Jobs** 1. Exposure to different types of electrical accessories like types of switches, types of lamps, wires and cables 2. Identification and use of Electrical and electronics components and laboratory tools. 3. Soldering Practice and fabrication of D.C Power supply circuits on General Purpose PCB/bread board. 4. Fabrication of comparator circuit/square wave generator using 555 Timer/IC 741 on general purpose PCB and bread board. 5. Importance of Neutral and structure Grounding and exposure to various earthing schemes. 6. Exposure to different types of illumination equipments Viz. (various lamps sodium high pressure mercury vapour lamp, CFL, LED etc (which may include Commercial illumination schemes and a typical illumination scheme). 7. Realization of different types of wiring systems like tube light wiring, staircase wiring along with the protection elements like fuse, MCB, ELCB etc.	5

	8. Different faults in domestic appliances like automatic iron, mixture, Oven, washing machine and repairing of the same. Application of Tester and Test Lamp for fault finding in Electrical Systems. 9. Assembling and dissembling of D. C. Machine, single phase motor and its meggering. 10. Assembling and dissembling of single phase transformer and its meggering. 11. Assembling and dissembling of three phase induction motor and its meggering. 12. Demonstration of distribution system for domestic wiring/commercial wiring 13. Calibration of Energy meter. 14. Introduction to DOL starter with power circuit and its control circuit 15. Introduction to STAR-DELTA starter with power circuit and its control circuit 16. Study of electric shocks and first aid treatments.	
III	**Computer Engineering Shop** • Hardware Shop **List of Jobs** 1.Disassemble and assemble the PC back to working condition; 2**:** Install MS windows and Linux on the personal computer and configure to dual boot the system; 3**:** Troubleshooting**:** Students to be given a PC which does not boot due to improper assembly or defective peripherals and system software problems. To identify the problem and fix it to get the PC back to working condition • Software Shop **List of Jobs** 4: Students to get connected to their Local Area Network and access the Internet. In the process to configure the TCP/IP setting, access the websites and email; Job 5: Productivity Tools- Use Office Tools Word, Excel for creating Scheduler, Calculating GPA, basic Power Point utilities and tools which help to create basic Power Point Presentation as well as interactive Presentation using Hyperlinks, Inserting –Images, Clip Art, Audio, Video, Objects, Tables and Charts.	4
IV	Revision of the Experiments and Internal Viva	1
Total		12