

**Integral University**  
**STUDY & EVALUATION SCHEME**  
**B.Tech. First Year (Common to all Branches)**

Year 1<sup>st</sup>, Semester I

S. No	Course Code	Subject	Periods			Evaluation Scheme			Subject Total	
			L	T	P	Sessional Exam		Exam		
						CT	TA	Total		ESE
<b>Theory Subjects</b>										
1.	IPH -101/ ICH-101	Physics / Chemistry	03	01	00	30	20	50	100	150
2.	IPC-101/ IES-101	Professional Comm.1/ Environmental Studies	03	01	00	30	20	50	100	150
3.	IMA-101	Mathematics -I	03	01	00	30	20	50	100	150
4.	IEN-101/ IME-101	Basic Electrical Engineering/ Basic Mechanical Engineering	03	01	00	30	20	50	100	150
5.	ICS-101 IEC-101	Computer Programming/ Basic Electronics	03	01	00	30	20	50	100	150
6.	IEL-101 IME-102	English Language & Grammar / Manufacturing Process	02	01	00	15	10	25	75	100
<b>Practicals/Design/Drawing</b>										
7.	IPH-151/ ICH-151	Physics Lab / Chemistry Lab	0	0	02	10	10	20	30	50
8.	IEN-151/ IME-151 IBT-151	Electrical Engineering/ Mechanical Engineering/ Biology Lab	0	0	02	10	10	20	30	50
9.	ICS-151 IWS-151	Computer Programming Lab/ Workshop Practice	-	0	2/3	10	10	20	30	50
10.	ICE-151/ IPC-151	Engineering Graphics/ Professional Comm. lab	1	0	03	10	10	20	30	50
11.	GP-101	General Proficiency	-	-	-	-	-	50	-	50
<b>Total</b>			<b>19</b>	<b>06</b>	<b>9</b>	<b>-</b>	<b>-</b>	<b>405</b>	<b>695</b>	<b>1100</b>

**PHYSICS**  
**IPH-101 / IPH-201**

**Unit I: Electrostatics-**

**8**

Boundary conditions and Boundary value problems in electrostatics, The Uniqueness theorem, Laplace and Poisson's equations in electrostatics and their applications, method of electrical images and their simple applications, energy stored in discrete and continuous system of charges.

**Unit II: Wave Optics-**

**8**

Methods of formation of coherent sources, **Theory of Interference**, Fresnel's Biprism, **Displacement of Fringes**, thin film interference, Newton's ring. Fraunhofer diffraction at single slit and grating, Rayleigh's criterion of resolution, resolving power of grating.

**Unit III: Optical activity and Modern Optics-**

**8**

Production of plane polarized light by reflection and Double refraction, Nicol prism. Optical activity, **Fresnel's theory**, polarimeter (Laurentz and Biquartz). Principle of fiber optics, numerical aperture, attenuation, dispersion in optical fibers, material dispersion, waveguide dispersion, intermodal and intramodal dispersion, Pulse dispersion in step index fiber, Main components of laser, Einstein's coefficients, He-Ne laser, Nd-YAG laser and their applications.

**Unit IV: Properties of Matter and Relativistic Mechanics-**

**8**

Viscosity, Poiseulli's equation, Frame of reference, Michelson-Morley experiment and its implications, Galilean transformation equations, Einstein's postulates, Lorentz transformation equations and their consequences, energy mass relation, **relativistic kinetic energy**.

**Unit V: Quantum Physics-**

**8**

Compton effect, Basic postulates of quantum mechanics, Wave function and its physical admissibility, orthogonality and normalization of wave functions, Heisenberg's uncertainty principle(no derivation) and its applications to (non-existence of electron in nucleus, Bohr's radius), Schrodinger's equation and its application to particle in 1-D box and finite well.

**CHEMISTRY**  
**ICH-101/201**

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**UNIT I**

1. Molecular theory of heterodiatomic molecules, Band theory of bonding in metals, Hydrogen bonding.
2. Solid state chemistry: Radius ratio rule, Space lattice (only cubes), Type of unit cell, Bragg's Law, Calculation of density of unit cell. One and Two Dimensional solids, Graphite as two dimensional solid and its conducting properties. Fullerene and its applications.

**UNIT II**

1. Basic principles of spectroscopic methods. The use of UV, Visible, IR, <sup>1</sup>HNMR, for the determination of structure of simple organic compounds.
2. Characteristics and classification of polymers.
3. Structures of the polymers: Natural and synthetic rubbers, Polyamides and polyester fibers, Polymethylmethacrylate, Polyacrylonitrile and Polystyrene. A brief account of conducting polymers (polypyrrole and polythiophene) and their applications.

**UNIT III**

1. Stability of reaction intermediates, *e.g.* Carbanions, Carbocations and free radicals. Types of organic reactions, and mechanism of nucleophilic substitution reactions.
2. Mechanism of following reactions.  
1. Aldol condensation (ii) Cannizzaro reaction (iii) Beckmann rearrangement (iv) Hofmann rearrangement and (v) Diels-Alder reaction.
3. E-Z Nomenclature. Optical isomerism of organic compounds containing one chiral center. Examples of Optically active compounds without chirality. Conformations of n-butane.

**UNIT IV**

1. Order and molecularity of reactions. First and second order reactions. Energy of activation.
2. Phase Rule, its application to one component system (water).
3. Equilibrium potential, electrochemical cells (galvanic and concentration cells), Electrochemical theory of corrosion and protection of corrosion.

**UNIT V**

1. Classification of fuels, Coal, Biomass and Biogas. Determination of gross and net calorific values using Bomb Calorimeter.
2. First law of thermodynamics and its mathematical statement, heat, energy and work; Heat content or Enthalpy of a system; Thermochemistry: Hess's law of constant heat summation, Heat of reaction, Heat of combustion, Heat of neutralization, Heat of formation, Heat of fusion, Heat of vaporization, Heat of sublimation, Heat of solution and Heat of dilution (only definition and explanation).

3. Hardness of water, softening of water by Lime-Soda process, Zeolites and ion-exchange resins process and Reverse Osmosis. Treatment of boiler feed water by Calgon process,.

**REFERENCE BOOK:**

1. Engineering Chemistry by Jain and Iain.
2. Engineering Chemistry by R. K. Agrawal

## SYLLABUS FOR PROFESSIONAL COMMUNICATION

PC 101/ 201

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- UNIT I *Introduction to Communication* 04 HRS  
Definition, Types of Communication, Channels of Communication, Language
- UNIT II *Interpersonal Communication* 06 HRS  
Culture- Definition and Types, Communication and Culture including Cross Cultural Communication
- UNIT III *Written Communication* 08 HRS  
Letter Writing- Informal and Formal - Letters of Enquiry, Letters of complaint, Response to complaints and enquiries, Self Exploration through description
- UNIT IV *Grammar through Worksheets* 12 HRS  
Situational activities and modules- Parts of Speech, Tenses, Articles, Modals, Active and Passive, Subject-Verb Agreement, Direct and Indirect Speech, Degrees of comparison
- UNIT V *Grammar through Worksheets Continued* 10 HRS  
Sentences: Simple, Compound, Complex, Declarative, Assertive, Negative, Interrogative, Exclamatory, Imperative

### RECOMMENDED BOOKS:

1. Wren PC and Martin H, "High School Grammar and Composition", S. Chand and Co.
2. K. Floyd , "Interpersonal Communication: The Whole Story" (2009), McGraw Hill,
3. Greenbaum Sidney and Nelson Gerald, "An Introduction To English Grammar", Pearson
4. Swan Michael, "Practical English Usage" OUP, 2005
5. Raymond Murphy, " Intermediate English Grammar", (2007) Cambridge University Press

Sugh Alabi  
13/2/21

**ENVIRONMENTAL STUDIES**  
**IES-101/201**

**Unit-I**

**Multidisciplinary nature of Environmental Science and Natural Resources**

Multidisciplinary nature of Environmental studies

Definition, Scope and Importance of Environmental Science and Need of public awareness.

**Natural resources**

**Renewable and non-renewable resources**

Natural resources and associated problems.

**a. Forest Resources:**

Use and over Exploitation , Deforestation, case studies. Timber extraction, Mining, dams and their effects on forests and tribal people.

**b. Water Resources:**

Use and over utilization of surface and ground water, Floods, Drought, Conflicts over water, dams- benefits and problems.

**c. Mineral Resources:**

Use and exploitation, environmental effects of using and extracting minerals resources, case studies.

**d. Food Resources:**

World food problems, Changes caused by agriculture and over grazing, effects of modern agriculture, fertilizer pesticide problems, Water logging, Salinity, case studies.

**e. Energy Resources:**

Growing energy needs, renewable and nonrenewable energy sources, use of alternative energy sources, case studies.

**f. Land Resources:**

Land as resource, Land degradation, Man induced land slides, Soil erosion and desertification.

- Role of individual in conservation of resources
- Equitable use of resources for sustainable life style

**Unit-II**

**Ecosystem**

Concept of an Ecosystem

Structure of Ecosystem, Function of Ecosystem

Producer Consumer and decomposers

Energy flow in the Ecosystem

Ecological Succession

Food chains, Food web, Ecological Pyramids

**Introduction, types, characteristics features structure and function of the following ecosystem:**

**a-** Forest Ecosystem

- b- Grassland Ecosystem
- c- Desert Ecosystem,
- d- Aquatic Ecosystem:(Ponds, streams, lakes, rivers, oceans, estuaries)

### **Unit-III**

#### **Biodiversity and its conservation**

Introduction Definition of Biodiversity: Genetic, Species and Ecosystem diversity, Bio-Geographical classification of India, Value of Bio-diversity: Consumptive, productive, Social, ethical, aesthetic and optional values, Biodiversity at Global, National & Local levels, India as a Mega Diversity Nation, Hotspots of Biodiversity, Threats to Biodiversity, Habitat Loss, Poaching of Wildlife, Man-Wildlife Conflicts, Endangered species of India IUCN Red data book, Endemic species of India, Conservation of Biodiversity: In-situ and Ex-situ conservation of biodiversity.

### **Unit-IV**

#### **Environmental Pollution**

Environmental Pollution  
Definition

Causes, effects and control measures of

- Air Pollution
- Water Pollution
- Soil Pollution:
- Marine Pollution:
- Noise Pollution:
- Thermal Pollution
- Nuclear Hazards

#### **Solid Waste Management:**

-Causes, Effects and Control measures of Urban and Industrial Wastes. -Role of an Individual in prevention of pollution.  
-Pollution case studies

**Disaster Management:** Floods, Earthquake, Cyclones and Landslides.

### **Unit-V**

#### **Social Issues and the Environment**

From unsustainable development to sustainable development, Urban problems related to Energy, Water conservation, Rain water Harvesting, Water shed

management, Resettlement and Rehabilitation of people; its problems and concerns, case studies, Environmental ethics: issues and possible solutions Wasteland reclamation, Consumerism and waste product.

Environment protection Act, Air (prevention and control of Pollution) Act, Water (prevention and control of Pollution) Act, wildlife protection Act, Forest

conservation act, Issues involved in Enforcement of Environmental Legislation, Public Awareness.

### **Human Population and the Environment**

Population growth variation among nations, Population Explosion, Family welfare programme, Environment and Human Health, Human Rights, Value education, HIV/AIDS, Women and Child welfare, Role of Information Technology in Environment and Human Health.

### **Suggested field work**

Visit to local area to document environment assets river/ forest/ grassland/ hill/ mountain, visit to local polluted site urban/ rural/ industrial/ agricultural, study of common plants, insects, birds, study of simple ecosystems pond river, hill slopes etc.



**MATHEMATICS-I**  
**IMA 101**

**L T P**  
**3 1 0**

**Unit-I : Matrices**

Introduction, Elementary row and column transformations, Rank of matrix, Linear dependence, Consistency of linear system of equations, characteristic equation, Caley-Hamilton Theorem, Eigen values and eigen vectors, Diagonalisation, Complex and unitary matrices. [10]

**Unit II: Differential Calculus-I**

$n^{\text{th}}$  derivative, Leibnitz theorem, Partial differentiation, Euler's theorem, Curve tracing, Change of variables, Expansion of function of several variables. [8]

**Unit-III : Differential Calculus-II**

Jacobian, Approximation of errors, Extrema of functions of several variables, Lagrange's method of multipliers (Simple applications). [8]

**Unit-IV : Multiple Integrals**

Double and triple integrals, Change of order of the Integration, Change of variables, Beta and Gamma functions, Application to area and volume, Dirichlet's integral and its applications. [8]

**Unit-V : Vector Calculus**

Point functions, Gradient, divergence and curl of a vector and their physical interpretations, Line, Surface and Volume integrals, Green's, Stoke's and Gauss divergence theorems. [8]

**Reference Books:**

1. Shanti Narayan      A Text Book of Matrices, S. Chand & Co.
2. Thomas/Finny      Calculus and Analytical Geometry, Narosa House.
3. B.S. Grewal      Higher Engineering Mathematics, Publishers,
4. Piskunov, M.      Differential and Integral Calculus, Peace Pub.
5. Jaggi and Mathur :    Advanced Engineering Mathematics, Khanna
6. C. Prasad      Mathematics for Engineers, Prasad

**BASIC ELECTRICAL ENGINEERING**  
**IEN-101/201**

**UNIT-1**

**D.C CIRCUIT ANALYSIS AND NETWORK THEOREMS**

**Circuit concepts:** Concept of network, Active and passive elements, voltage and current sources, concept of linearity and linear network, unilateral and bilateral elements, R L and C as linear elements, source transformation, Kirchoff's Law: loop and nodal methods of analysis, star delta transformation, network theorems: Thevenin's theorem, Norton's theorem, maximum power transfer theorem. (8)

**UNIT-2**

**STEADY STATE ANALYSIS OF SINGLE PHASE AC CIRCUITS**

**AC fundamentals:** Sinusoidal, square and triangular waveforms-average and effective value, form the peak factors, concept of phasors, phasors representation of sinusoidally varying voltage and current, analysis of series-parallel RLC circuits. Apparent, active and reactive powers, power factor, causes and problems of low power factor, power factor improvement, resonance in series and parallel circuits, bandwidth and quality factors. (8)

**UNIT-3**

**THREE PHASE AC CIRCUITS**

**Three phase system:** Its necessity and advantages, meaning of phase sequence, star and delta connections, balanced supply and balanced load, line and phase voltage/current relation, three phase power measurements.

**MEASUREMENT INSTRUMENTS**

**Types of instruments:** construction and working principle of PMMC and MI type voltmeter and ammeters, single phase dynamometer type wattmeter and induction type energy meter, use of shunts and multipliers. (8)

**UNIT-4**

**INTRODUCTION OF POWER SYSTEM:** general layout of electrical power system and function of its elements, standard transmission and distribution voltages, concept of grid.

**MAGNETIC CIRCUIT**

**Magnetic circuit:** Concepts, analogy between electric and magnetic circuit, magnetic circuits with DC and AC excitation, magnetic leakage, BH curve, hysteresis and eddy current losses, magnetic circuit calculation, mutual coupling.

**Single Phase Transformer:** Principle of operation, construction, emf equation, equivalent circuit, power losses, efficiency, Introduction to auto transformers. (8)

**UNIT-5**

**Principle of Electromechanical energy conversion**

**DC Machines:** Types, emf equation of generator and torque equation of motor, characteristics and applications of DC motors.

**Three Phase Induction Motor:** Type, principle of operation, slip-torque Characteristics, applications.

**Single Phase Induction Motor:** Principle of operation and introduction to methods of starting, applications.

**Three Phase Synchronous Machines:** Principle of operation of alternator and synchronous motor, applications. (8)

**References:**

2.V.Deltoro, "Principle of Electrical Engg." PHI.

3.M.A Mallick, Dr. I. Ashraf, "Fundamental of Electrical Engg," Word Press, Lucknow.

4.A. Hussain, "Basic Electrical Engg" Dhanpat Rai & sons.

5.I J Nagrath, "Basic Electrical Engg" ,TMH

**BASIC MECHANICAL ENGINEERING**  
**IME-101/IME-201**

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**3 1 0**

**A. FUNDAMENTALS OF THERMODYNAMICS**

**Unit –I**

**Fundamental Concepts and Definitions:**

Definition of Thermodynamics, System, surrounding and universe, Phase, Concept of continuum, Macroscopic & microscopic point of view. Density, Specific volume, Pressure, temperature. Thermodynamic equilibrium, Property, State, Path, process, Cyclic process, Energy and its form, Work and heat, Enthalpy. **3**

**Laws of thermodynamics:**

**Zerth law:** Concepts of Temperature, Zerth law. **1**

**First law:** First law of thermodynamics. Concept of processes, Flow processes and control volume, Flow work, Steady flow energy equation, Mechanical work in a steady flow of process. **4**

**Second law :** Essence of second law, Thermal reservoir, Heat engines, COP of heat pump and refrigerator. Statements of second law, Carnot cycle, Clausius inequality. Concept of Entropy. **4**

**Unit –II**

**Properties of steam and thermodynamic cycles :**

Properties of steam, Use of property diagram, Steam tables, Processes involving steam in closed and open systems. Ranking cycle

**Introduction to I.C. Engines:** Two, four stoke S.I. and C.I. engines. Otto cycle, Diesel cycle. **4**

**B. MECHANICS AND STRENGTH OF MATERIALS**

**Unit-III**

**Force system and Analysis:**

**Basic Concept:** Laws of motion. Transfer of force to parallel position, Resultant of planer force system. Free Body diagrams, equilibrium and its equation. **4**

**Friction:** Introduction, Laws of Coulomb friction, Equilibrium of bodies involving dry fiction belt friction. **2**

**Unit –IV**

**Structure Analysis :**

**Beams:** Introduction, Shear force and bending moment, Shear and bending moment diagram for statically determinate beams. **4**

**Trusses:** Introduction, Simple Trusses, Determination of forces in simple trusses members, methods of joints and method of section. **4**

## **Unit-V**

### **Stress and Strain Analysis :**

**Simple Stress and strain:** Introduction, Normal shear stresses, Stress-strain diagrams for ductile and brittle materials, Elastic constants, One dimensional loading of members of varying cross sections, Strain Energy. **4**

### **Pure Bending of Beams**

Introduction, Simple bending theory, Stress in beams of circular, rectangular and triangular cross section. **2**

**Torsion:** Introduction, Torsion of shafts of circular section, Torque and Twist, Shear stress due to Torque. Comparison of hollow and solid circular shafts. **4**

### **Reference:**

1. Van Wylen G.J. & Sonntag R.E. Fundamentals of Classical Thermodynamics, John Wiley & Sons, Inc. NY.
2. Wark Wenneth: Thermodynamics (2<sup>nd</sup> edition) Mc Graw Hill Book Co. NY.
3. Holman, J.P.: Thermodynamics, Mc Graw Hill Book Co. NY.
4. Shames I.H., Engineering Mechanics, P.H.I.
5. D.S. Kumar, Mechanical Engineering, S.K. Katarial & Sons.
6. Bhavi Katti S.S., Engineering Mechanics, New Age Pub.
7. P.K. Bharti: Engineering Mechanics, Kataria and Sons.
8. R.K. Rajput, Mechanical Engineering, Laxmi Pub.

**COMPUTER PROGRAMMING**  
**ICS 101/ ICS 201**

**L T P**  
**3 1 0**

**UNIT -1**

**Introduction to Computers:** Generation of computers, Characteristic and classifications of computers.

**Components of Computer:** CPU, Various I/O Devices, **Memory & its types** , (Memory Hierarchy, Storage Media), Computer Software and their types, Operating System.

**Computer Networks & Communication:** LAN, MAN, WAN, Network Topologies, Modes of Data Communication.

**Introduction to Internet and its Safeguard:** Internet Addresses, Domain Name System, URL, Web Browsers Search Engines, Firewalls , Anti-Virus, **Translators**.

**Algorithm and flowchart:** Algorithm and flow chart characteristics, Sketching Flowcharts of various problems. [09]

**Unit 2**

**Starting C:** Standard I/O in ‘C’, ‘C’ Fundamental, C Character set, Constants, Variables, Keywords and Identifiers, Data types, Declaration. Operators and Expressions, Conditional statements (If, If-else), Nesting of if- else statement, switch statement, The?: operator, goto statement.

**Decision making and Looping** (While, Do-While, for), Break and Continue statements, Case Control Structures (Switch), **C programs based on above concepts**. [08]

**Unit 3**

**Introduction to pointers:** declaration and initialization of pointers, accessing the address of the variable, accessing the variable through the pointer, chain of pointers, pointers operators, pointer arithmetic

**Introduction to Functions:** Need of “C” function, User Defined and Library Functions, Prototype of Function, Call by Value; Call by Reference; Nesting of Functions, Recursion. Pointers with function, **C program based on above concept** [09]

**Unit 4**

**Array:** Concept of One Dimensional and Multi Dimensional arrays, Declaration,

**Operations:** insert, delete, search, traverse, and merge, matrix operations, **Sorting:** Bubble sort, merge sort, insertion sort.

**Character array and strings:** declaring and initializing strings variable, reading and writing a character, reading and writing strings from terminal, Arithmetic operations on characters, string handling functions. Application of pointers, and function on array, **C program based on above concept** [10]

**Unit 5**

**Structures:** Defining Structure, Declaration of Structure Variable, Accessing Structure members, copying and comparing structure variable, operation on individual member,

nesting of structures, Array of structures. Application of pointers and function on Structures.

**Union** Defining Union Declaration of Union, difference between structure and Union, **Introduction of Static and Dynamic memory allocation-** The process of Dynamic memory allocation, , **C program based on above concept.** [08]

**References:**

1. Foundation of Information Technology by 'D.S. Yadav' - New age International
2. Programming in 'C' by 'E Balagurusamy' .-TMH Publication.
3. Let us 'C' by 'Yashwant Kanitkar' -BPB Publication.
4. The C Programming Essentials by Dey- Pearson Publication.

**BASIC ELECTRONICS**  
**IEC-101**

**L T P**  
**3 1 0**

**UNIT-I**

**Semiconductor Diode**

**Mechanism of Conduction in Semiconductors:** Mobility and Conductivity, Electrons and holes in an intrinsic semiconductors, Donor and acceptor impurities, Fermi level, Carrier densities in semiconductor, Hall effect, Diffusion, Recombination

**Junction Diode**

PN junction characteristic and its equation, Effect of Temperature, Depletion Layer, Piecewise linear diode model, Breakdown Mechanism, Zener and Avalanche Breakdown characteristics

**Diode as circuit element**

Half wave and full wave rectifiers, capacitive filters, Zener diode as a regulator, clamper, clipper and voltage doubler, **special diode-** LED, Schottkey diodes

(8)

**UNIT-II**

**BJT characteristics and circuits**

Transistor Operation, CE, CB, CC configuration and their characteristics, transistor biasing circuits, stability factor, h- parameter model (low frequency), computation of  $A_i$ ,  $A_v$ ,  $R_i$ ,  $R_o$  of single transistor CE amplifier configuration.

(8)

**UNIT-III**

**Field Effect Transistors**

**JFET:** Construction and principle of working, Drain / Transfer characteristics, basic amplifier circuits, Biasing of JFET  
**MOSFET:** Enhancement and depletion type N-channel, P-channel, Drain / Transfer Characteristics.

(8)

**UNIT-IV**

**Switching theory & Logic gates**

Number system, Conversion, Compliments, Addition and Subtraction, BCD numbers, Boolean algebra, Canonical form, Logic gates, Minimization of logical function using Karnaugh map

(8)

**UNIT-V**

**Operational Amplifier**

Concept of ideal operational amplifier (inverting and non-inverting) and its applications, Inverter, integrator, differentiator, voltage follower, summing and differential amplifier

**Electronic Instruments:** Digital Multimeter (block diagram approach), CRO (block diagram and its



working), Measurement of voltage, phase, frequency. Double beam CRO (block diagram & its working).

(8)

**Text Books**

1. Bolyested& Nashekey / Electronic Devices and Circuit Theory, PHI
2. Milliman & Halkias: Integrated Electronics , Mc Graw Hill
3. J. S. Katre: Electronics Engineering, Tech-Max Publication

Syllabus for English Language, Grammar and Soft Skills

EL 101/201

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UNIT 1	06HRS
<b>Language Tools:</b> Euphemism, one word substitution, synonym, antonym, homophones, idioms and phrases, common mistakes, confusable words and expressions.	
UNIT II	06HRS
<b>Reading and Comprehension:</b> Based on short stories and essays	
UNIT III	06HRS
<b>Social Grace and Business Etiquette</b> Introductions and Greeting, Business Etiquettes-Dress, Telephone, Email, Dining and Interview	
UNIT IV	04HRS
<b>Team Spirit</b> Defining a Team, Teamwork, Types of teams, Leadership skills	
UNIT V	08HRS
<b>Behavioural Traits:</b> Attitude, Motivation, Personality, Time Management and Decision Making	

Books Recommended:

1. Robbins S.P, Judge T.A and Sanghi S, "Organizational Behavior", Pearson, 13<sup>th</sup> Edition, 2009
2. Post Peggy, Post Anna and Senning Daniel Post, "Emily Post's Etiquette" 18<sup>th</sup> Edition
3. Word Power Made Easy by Norman Lewis, Goyal Publishers, 2009
4. Michael McCarthy and Felicity O' Dell, "English Vocabulary in Use", (2002) Cambridge University Press

*Suzh Alaidi*  
13/2/14

**MANUFACTURING PROCESSES**  
**IME-102/IME-202**

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**Unit –I**

**Basic Metals & Alloys: properties and Applications**

**Properties of Materials**

Strength, elasticity, stiffness, malleability, ductility, brittleness, toughness and hardness, Elementary ideas of fracture, fatigue & creep. 2

**Ferrous Materials**

Carbon steels, their classification based on percentage carbon as low mild, medium & high carbon steels, their properties & applications. Wrought iron, cast iron alloy steels, stainless steel, tool steel. Elementary introduction to heat treatment to carbon steel: annealing, normalizing, quenching & tempering casehardening. 3

**Non-Ferrous Metal & Alloys:**

Common uses of various non ferrous metals & alloys & their compositions such as copper alloys: Brass, Bronze, Aluminium alloys such as Duralumin. 3

**Unit-II**

**Introduction to Metal forming and Machining processes**

**Metal Forming**

Hot working, various cold working processes, Basic metal forming operations such as forging, Rolling, Wire & Tube drawing & extrusion, and their applications. Press working, Die and punch assembly, cutting & forming and their applications 4

**Machining & Their Applications:**

Basic principles of lathe-Machine and forming and their applications of shaper planer, drilling, Milling & grinding. 4

**Unit-III**

**Introduction to casting and welding processes**

**Casting**

Pattern & allowances, Molding sand and its desirable properties. Mould making with the use of core, Gating System, Casting defects and remedies. Cupola furnace Die Casting and its uses. 4

**Welding**

Importance & basic concepts of welding, classification of welding processes Gas-welding, types of flames, Electric-arc welding. Resistance welding soldering and brazing and their uses. 4

## **Unit-IV**

### **Misc. Topics Manufacturing**

Importance of materials & manufacturing for the socio-economic development, plant location, plant layout-it types, types of production. Production verous productivity.

3

### **Non Metallic Materials**

Common types and uses of wood, cement-concrete, ceramics, rubber, plastics and composite-materials.

2

### **Important Misc. Processes**

Powder-metallurgy process and its applications, Plastic products manufacturing, galvanizing and electroplating operations.

3

**PHYSICS PRACTICALS**  
**IPH-151/251**

1. To determine the wave length of monochromatic light by Newton's ring.
2. To determine the wave length of monochromatic light with the help of Fresnel's Biprism.
3. To determine the focal length of two lenses by nodal slide and locate the position of cardinal points.
4. To determine the specific rotation of cane sugar solution using Biquartz polarimeter.
5. To determine the wavelength of spectral lines using plane transmission grating.
6. To determine the Brewster's angle and refractive index of material with the help of a laser source.
7. To determine the variation of magnetic field along the axis of a current carrying coil and then to estimate the radius of the coil.
8. To verify Stefan's law by electrical method.
9. To determine the energy band gap of a given semiconductor material.
10. To determine the viscosity of a liquid.

**CHEMISTRY**  
**ICH-151/251**

**List of Experiments**

1. To determine the Iron content in the given iron ore by using external indicator.
2. To determine the Alkalinity in the given water sample
3. To determine the Chloride content in the given water sample by Mohr's method. (Argentometric method)
4. To determine the Percentage of Available Chlorine in the given sample of Bleaching powder iodometrically.
5. To determine the temporary and permanent hardness in water sample by Complexometric titration using EDTA as standard solution.
6. To determine the Equivalent weight of Iron by Chemical Displacement method. (The Equivalent weight of Copper is 63.5 )
7. To determine the strength of given HCl solution by titrating it against NaOH solution using pH meter.
8. To determine the iron concentration in the given water sample by Spectrophotometer using potassium thiocyanate as colour developing agent.
9. To detect the presence of functional groups in the given organic compound.
10. **To detect the presence of Elements in the given organic compound.**

**ELECTRICAL ENGINEERING LAB**  
**IEN 151/IEN 251**

**List of Experiments:**

- 1.Verification of Thevenin's Theorem.
- 2.Verification of Superposition Theorem.
- 3.Verification of Maximum Power Transfer Theorem.
- 4.To study V-I characteristics of diode.
- 5.To study the input & output characteristics of BJT in CE configuration.
- 6.To study the full wave rectifier circuit with & without filter and determine the ripple factor.
- 7.To study the phenomenon of resonance in series RLC circuit.
- 8.Determination of losses in single phase transformer by OCT and SCT.
- 9.To calibrate a single phase induction type energy meter.
- 10.To study the running and reversing of a three phase SCIM.
- 11.Study of OP Amp based inverting and non inverting amplifier.

**BASIC MECHANICAL ENGINEERING LAB**  
**IME-151/IME-251**

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**0 0 2**

**List of Experiments**

1. To study and sketch the model of fire tube (Lancashire and Locomotive) boiler.
2. To study and sketch the model of water tube (Babcock & Wilcox) boiler.
3. To study and sketch the model of two stroke S.I. Engines.
4. To study and sketch the model of four stroke S.I. Engines.
5. To study and sketch the model of four stroke C.I. Engines.
6. To study and sketch the model of vapour compression refrigerator.
7. To study and sketch the model of simple steam engine.
8. To determine the Rockwell hardness no. of a given specimen using hardness tester.
9. To perform the tensile test on specimen and determine the different mechanical properties with the help of UTM.
10. To determine the impact strength of mild steel by Izod method using impact testing machine.
11. To perform the compression test on brick and determine the ultimate compressive strength with the help of UTM.



**BIOLOGY LAB**  
**IBT-151**

**L T P**  
**0 0 2**

1. Enzyme: salivary amylase test.
  - Degradation of starch into glucose.
  - Starch – Iodine test
  - Glucose – Glucose strip test
  -
2. Contamination experiment:
  - Free medium – Contamination
  - Medium+ antibiotic/Antimicrobial agent – No contamination
  - Study of contaminants – Bacterial
  - Fungal etc.
3. Denaturation of enzyme / amylase by heating
4. Determination of starch/polysaccharide content in various food seeds (cereals)
5. Protein content in various food seeds.
6. Difference between monosaccharides, disaccharides and polysaccharide.
7. Handling and use of various types of microscope
  - Simple (SM)
  - Compound (CM)
  - Stereomicroscope
  - Inverted (IM)
8. Cellular staining of a microbial cell: microscopic observations and morphology (CM).
9. Cellular staining of a plant cell: microscopic observations and morphology (C.M.)
10. Cellular staining of an animal cell: microscopic observation and morphology (C.M.)
11. Visual observations of various internal organs in frog and mouse etc.
12. Difference between mitosis and meiosis
13. Cytogenic aspects in microscopic view:
  - Somatic cells – Leaf etc
  - Reproductive cells – Anthers, sectioning ovules

**COMPUTER PROGRAMMING LAB**  
**ICS-151/ICS-251**

**L T P**  
**0 0 2**

1. Programs based on basic concepts of C. (e.g. Addition, Subtraction, Multiplications, Swapping of numbers, Conversions, area calculation, interest calculation...etc)
2. Programs based on Conditional statement.
3. Programs based on loop Conditions (FOR, WHILE, DO- WHILE).
4. Programs based on Single & Two dimensional Array (Insertion, deletion, Multiplication, searching, etc...).
5. Programs based on Pointers.
6. Programs based on Function call (Call by value and call by reference).
7. Programs based on recursion.
8. Programs based on Strings and its operations.
9. Programs based on Structures and its operations.
10. Programs based on Miscellaneous Concepts.

**WORKSHOP PRACTICE**  
**IWS-151/IWS-251**

**L T P**  
**0 0 3**

- 1. Machine Shop**
  - a. Study of tools and operations
  - b. Plane turning
  - c. Step turning
  - d. Taper turning
  - e. Threading
  - f. Single point cutting tool grinding.
  
- 2. Fitting Bench Working Shop**
  - a. Study of tools and operations
  - b. Simple exercises involving filing work.
  - c. Making perfect male-female joint
  - d. Simple exercises involving drilling/tapping/dieing
  
- 3. Black Smithy Shop**
  - a. Study of tools and operations
  - b. Simple exercises based on black smithy operations such as upsetting drawing down, punching, bending, fullering and swaging
  
- 4. Welding Shop**
  - a. Study of tools and Operations
  - b. Simple butt joint
  - c. Lap Joint
  - d. Oxy acetylene welding
  
- 5. Sheet Metal Shop**
  - a. Study of tools and Operations
  - b. Making funnel complete with soldering.
  - c. Fabrication of tool box, tray, electrical panel box etc.
  
- 6. Carpentry Shop**
  - a. Study of tools and Operations and carpentry joints.
  - b. Simple exercise using jack plain.
  - c. To prepare half lap corner joint, mortise and tennon joints.
  - d. Simple exercise on woodworking lathe.
  
- 7. Foundry**
  - a. Making a mould using single piece pattern .
  - b. Making a mould using two piece pattern
  - c. Making a mould using a pattern with core print
  - d. Melting Pouring and Making an Aluminium Casting.

**ENGINEERING GRAPHICS**  
**ICE-151/ICE-251**

**L T P**  
**0 0 3**

**1. Introduction**

Engineering graphics as a tool to communicate ideas, Lettering and dimensioning.  
Construction of geometrical figures like pentagon and hexagon.

**2. Orthographic Projection**

Principles of orthographic projections Principal and auxiliary planes, First and Third angle projections.

Projection of points. Pictorial view.

Projection of lines parallel to both the planes. Parallel to one and inclined to other, Inclined to both the planes.

Application to practical problems.

Projection of solid in simple position, Axis or slant edge inclined to one and parallel to other plane, solids lying on a face or generator on a plane.

Sectioning of solids lying in various positions, True shape of the section.

Development of lateral surfaces, sheet metal drawing.

**3. Isometric Projection**

Principles of isometric projection, Isometric projection using box and offset methods.

**References:**

1. Bhatt. N.D. : Elementary Engineering Drawing Charoathar Publishing.
2. Laxmi Narayan V and Vaish W: A Text Book of Practical Geometry and Geometrical drawing.

**PROFESSIONAL COMMUNICATION LAB:**

**PC 251/252**

- Day 1. Introductions (Instructors, Students and Curriculum)
- Day 2. Listening exercises
- Day 3. Framing Questions
- Day 4. Making Small talks
- Day 5. Presentation Making- tips, do's and don'ts/ group presentations
- Day 6. Group presentations
- Day 7. Phonetic alphabet
- Day 8. Phonetic transcription
- Day 9. Intonation
- Day 10. Stress
- Day 11. . Working on Negotiations
- Day 12- 14 Situational conversational section- Social language, emergency situations/  
seeking help, inquiries, communicating bad news
- Day 15: Exercise on cross cultural communication

*Sally A. G. L.*  
*13/2/14*