TECHNO INDIA UNIVERSITY
WESTBENGAL

EM 4, Sector V, Salt Lake, Kolkata-700091, West Bengal, India
Phone: +91 9836544416/17/18/19, Fax: +91 33 2357 1097

4-Year Bachelor of Technology (B.Tech.) Curriculum and Syllabus for Mechanical Engineering (ME)

Second Semester

Course Code	Course Title	Contact Hrs. / Week			Credit
		L	T	P	
Theory					
TIUFY-201	Career Advancement - Skill Development-II	2	0	0	2
TIUFY-202	Mathematics-II	3	1	0	4
TIUFY-203	Engineering Chemistry	3	0	0	3
TIUFY-204	Engineering Mechanics	3	0	0	3
TIUFY-205	Basic Electrical and ElectronicsEngineering	2	1	0	3
TIUFY-206	Problem Solving and Programming Using C	2	1	0	3
Practical					
TIUFY-293	Chemistry Laboratory	0	0	2	2
TIUFY-294	Introduction to Manufacturing Process Lab	0	0	2	1
TIUFY-295	Basic Electrical Engineering Lab & Simulation	0	0	3	2
TIUFY-296	Programming in C Lab	0	0	3	2
Sessional					
TIUFY-281	Entrepreneurship Skill Development-II	0	0	4	3
Total Credits					28

Approved By:
External Expert VC Registrar Dean of Academics Mentor of the Dept. HOD

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Syllabus

CAREER ADVANCEMENT - SKILL DEVELOPMENT-II
TIUFY-201

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

1. Technical CASD:

Module 1: Basic concepts, definitions and identities: - Test of divisibility. Square root and cube root
Module 2: Time and Work, Time and Distance
Module 3: Average, Percentages, Profit and loss
Module 4: Non-Verbal:- Series

2. Non-Technical CASD:

Module 1: Language

1. Introduction to a systematic approach to building Vocabulary
2. Practice with Nouns
3. Practice with Articles
4. Practice with Pronouns and Adjectives
5. Practice with Subject and Predicate
6. Practice with Verbs
7. Practice with Clauses and Noun Clauses
8. Practice with Adjective Clauses
9. Practice with Adverb Clauses
10. Practice with Sentences
11. Practice with Tenses
12. Practice with Prepositions

Module 2: Literature

1. Novel: Great Expectations- Charles Dickens
2. Short Story:
    a. OX by H.E. Bates
    b. Araby by James Joyce
3. Comprehension

Module 3: Communication Theory

1. Theory of Communication- Meaning of communication, communication process, purpose of communication
2. Basic Elements of Communication-Sender, Message, Receiver, Channel

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3. Models of Communication-Historical background, Lasswell's model, Shannon & Weaver's model, Schramms model, Gerbner's model.
4. Barriers to Effective Communication-failure of sender, failure of the messenger, failure of the message, failure of the recipient, communication feedback
5. Role of Communication in Business-outward, internal, upward, downward (Memo's, Notices, Circulars and Meetings)
6. The Role of Union in Communication: Meetings, Agenda, Minutes,
7. Other Kinds of Communication: Poster presentations, Multimedia Presentations, Press Releases, Technical documents, Presentation for Meeting.

Module 4: Writing

1. Forms of Official Personal Communication
2. Letters, Report, Proposal, Paragraph, Presentations
3. Taking Leave
4. Introducing Yourself
5. Introducing People to One Another
6. Making Requests and Asking for Directions
7. Making and Accepting an Apology
8. Making a Complaint
9. Congratulating, Expressing Sympathy and Offering Condolences
10. Making Suggestions, Offering Advice and Persuading
11. Expressing Agreement/Disagreement and Seeking Clarification
12. Similes, idioms, se anecdotes- list will be provided

Recommended Books:

Main Reading

1. Wren & Martin, High School Grammar & Composition, S. Chand and Sons.
2. Charles Dickens, Great Expectations, Rupa Publications

Supplementary Reading

1. H.E. Bates, Selected Short Stories
2. James Joyce, Dubliners, Simon & Schuster
3. David Holmes, Communication Theory, SAGE Publications Ltd.

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MATHEMATICS-II
TIUFY-202

: 3-1-0 **Credit: 4**

Module 1 - Matrices and System of Linear Equations: Matrices, System of linear equations, Gauss elimination method, Elementary matrices. Elementary matrices, Invertible matrices Gauss-Jordon method for finding inverse of a matrix. Determinants, Basic properties of determinants. Cofactor expansion, Determinant method for finding inverse of a matrix, Cramer's Rule. Rank of a matrix, Solvability of a system of linear equations, some applications.

Module 2 - Finite Dimensional Vector Spaces and Linear Transformations: Vector space, Subspace, Examples. Linear span, Linear independence and dependence, Examples. Basis, Dimension, Extension of a basis of a subspace, Intersection and sum of two subspace, Examples, Row and column spaces, Application to the understanding of R^n. Linear transformation, Kernel and Range of a linear map, Rank-Nullity Theorem (Statement Only).

Module 3 - Inner Product Spaces, Eigenvalues, Eigenvectors and Diagonalizability: Inner product on R^n, Cauchy-Schwartz inequality, Orthogonal basis, Gram-Schmidt orthogonalization process. Orthogonal projection, Orthogonal complement, Projection Theorem, Fundamental Subspaces. Fundamental subspaces and their relations, an application (Least square solutions and least square fittings). Eigenvalues, Eigenvectors, Characterization of a diagonalizable matrix. Diagonalization: Example, An application. Diagonalization of a real symmetric matrix, Eigenvalues of Hermitian and Unitary Matrices.

Module 4 - Laplace Transform: Laplace transform: Laplace and inverse Laplace transforms, first shifting theorem, existence, transforms of derivative and integral Laplace transform: Differentiation and integration of transforms, unit step function, and second shifting theorem. Laplace transform: Convolution and applications, initial value problems

Recommended Books:

Main Reading

1. Serge Lang, Introduction to Linear Algebra, Springer Verlag.
2. S. Pal and S. Bhunia, Engineering Mathematics, Oxford University Press.
3. S. Kumaresan, Linear Algebra A Geometric Approach, Prentice Hall of India Private Limited.
4. T. Veerarajan, Engineering Mathematics, TMH
5. Jordan, Mathematical Techniques, Oxford University Press

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Supplementary Reading

1. Srimanta Pal, Mathematical Methods, Oxford University Press.
2. Martin, Algebra, Prentice Hall of India Private Limited.
3. Irvin Kreyszig, Advanced Engineering Mathematics, Addision Wiley Publishers.

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ENGINEERING CHEMISTRY
TIUFY-203

: 3-0-0 **Credit: 3**

Module 1 - Thermodynamics: First law of thermodynamics-system, process, Internal Energy, Enthalpy, Concept of reversible and irreversible process, mathematical form of reversible work, mathematical form of irreversible work, difference between the reversible and irreversible work done – graphically. Adiabatic reversible expansion, work done in isothermal and adiabatic process, Specific heat capacity, concept of molar specific heat at constant pressure (C_p), molar heat capacity at constant volume (C_v), Relationship between C_v and internal, Second law of thermodynamics-Entropy, free energy, Gibbs-Helmholtz free energy concept, concept of spontaneous and non-spontaneous process, free energy change and chemical equilibrium, Equilibrium condition for closed system, Phase and reaction equilibria, Maxwell relation, Carnot cycle, concept of calculating efficiency of machines.

Module 2 - Kinetics of Chemical reaction: Review of Chemical Kinetics – (Qualitative meaning of chemical kinetics, comparison with chemical dynamics; slow and fast reactions; rate of reactions; factors affecting the rate of reaction such as: concentration, temperature, nature of reactants and products, surface area of reactants, presence of catalyst and radiation; Rate constant; Rate law; Law of Mass Action; concept of energy barrier; threshold energy, activation energy; formation of activated complex; exothermic and endothermic reactions; collision theory for a chemical change; order of a reaction; rate equation of a first order reaction; half life period; molecularity of a reaction; mechanism of elementary and overall reaction; variation of rate constant with temperature; Arrhenius equation – $K=Ae^{-Ea/RT}$; related graphs; catalyst). Reversible, consecutive, and parallel reactions, steady state approximations, chain reactions

Module 3 - Electrochemical System: Redox reactions, conductance in electrolytic solutions, specific and molar conductivity, variations of conductivity with concentration, Kohlrausch's Law, electrolysis and law of electrolysis ,Electrochemical cells-dry cell-electrolytic cells and Galvanic cells, lead accumulator, EMF of a cell, Application of EMF measurements, standard electrode potential, Nernst equation and its application to chemical cells, Thermodynamic data, activity coefficient, Relation between Gibbs energy change and EMF of a cell, fuel cells, corrosion Ostwald's dilution law and its derivation, Strength of acids and bases based on their dissociation constant, Brönsted-Lowry and Lewis concept of acids and bases, Ionic product of water, pH of solutions and pH indicators, numerical, Common ion effect, Salt hydrolysis, Buffer solutions and its interpretations based on Le Chatelier's principle, Henderson's equation, numerical, Solubility product and its applications, numerical on solubility product.

Module 4 - Chemistry of metals: Coordination compounds - Introduction, ligands and chelate effect, coordination number, color, magnetic properties and shapes, IUPAC nomenclature of mononuclear coordination compounds, Bonding, Werner's theory, VBT, and CFT; structure and stereo isomerism, importance of coordination compounds (in qualitative inclusion, extraction of metals and biological system), Metal Carbonyls (preparation, stability, applications).

Module 5 - Oxidation-Reduction: Concept of oxidation and reduction in terms of oxygen, hydrogen, and electrons, concept of redox reaction–examples, Oxidation number, Calculation of the oxidation state in molecules and ions, metal oxidation states, oxidation and reduction in terms of change in oxidation number, Balancing of redox reaction in acidic and basic medium by oxidation number and ion electron method, redox potential, Diagrammatic Presentation of Potential data.

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Module 6 - Bonding in s, p, d-systems: Periodicity of elements with reference to s, p, d, and f block elements, concept of ionic bonding, factors influencing the formation of ionic bond, e.g electron gain enthalpy, ionization enthalpy, lattice energy and electro negativity, the relation between the ionic bonding and periodic table. Covalent bond, sigma and pi bonds: the examples of formation of ammonia, nitrogen, ethene, ethyne, and carbondioxide, Resonance, Concept of Octet and Fajan's rules. Co-ordinate or dative covalent bond: the examples of formation of oxy-acids of chlorine. Hydrogen bonding: it's essential requirements, the examples of hydrogen fluoride, water (ice), alcohol, etc. Metallic bonding, Vander Waals' forces. Valence Shell Electron Pair Repulsion Theory; Hybridization and shapes of molecules: hybridization involving s, p and d orbitals only; sigma and pi bonds. Molecular orbital theory: Qualitative treatment of homo-nuclear diatomic molecules of first two periods, Energy level diagrams, bonding, antibonding molecular orbitals, bond order, paramagnetism of O_2 molecule, d-orbital splitting in crystal field (Oh, Td).

Module 7 - Isomerism and Chirality: Definition and Classification of isomerism, Structural Isomerism, Stereo Isomerism, Geometric isomerism (Cis and Trans only),Optical isomerism, CIP rules, R,S-Configuration, Fisher, Wedge, Newmann, Sawhorse projection, Conformational analysis-acyclic systems, cyclohexane systems, structure-reactivity relationship, Wilkinson catalyst (Alkene hydrogenation).

Module 8 - Reaction Mechanism: Concept of Substitution, addition and elimination reactions, concept of homolytic and heterolytic fission, concept of electrophiles and nucleophiles. Inductive, mesomeric, electrometric effects, and hyper-conjugation, leaving group, reaction media, stereo chemical implications, free radicals and polar mechanisms, Nucleophilic substitution at the saturated carbon atom SN1, SN2, SN2, SNi, SNimechanism, elimination reaction E1, E2, and E1CB mechanisms. Basic pericyclic reactions, Types of pericyclic reactions, Diels-Alder reaction, Electrocyclic reaction, Sigmatropic rearrangement.

Module 9 - Bio-organic and basic environmental chemistry: Selected organic reaction in biological system (Glycolysis, TCA),Concept of bioenergetics, Structure of Hemoglobin, myoglobin, and concept of oxygen transport with special reference to ramachandran plot, basic concept of air, water and noise pollution, chemistry of air pollutants like SO_x, NO_x, and H_2S.

Recommended Books:

Main Reading

1. Atkins, Physical Chemistry, OXFORD
2. K. L. Chugh, Chemistry volume 1 and volume 2, Kalyani Publishers
3. Peter Sykes, A guide book to mechanisms in Organic Chemistry, Pearson

Supplementary Reading

1. J. Clayden, S. Warren, N. Greeves, P. Wothers, Organic Chemistry
2. Shriver and Atkins, Inorganic Chemistry, Oxford University Press

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ENGINEERING MECHANICS
TIUFY-204

: 3-0-0 **Credit: 3**

PART – I: STATICS

Fundamental of Mechanics: Introduction to mechanics; Basic concepts – mass, space, time and force; Particles and rigid bodies; Scalars and vectors; Free, sliding, fixed and unit vectors; Addition, subtraction and multiplication of two vector; Definition of a force; Classification of forces; Principle of transmissibility

Force systems: Introduction to different force systems; Composition of forces – triangle, parallelogram and polygon law of forces, and addition of two parallel forces; Resolution of forces; Moment of a force, Varignon's theorem; Couple of forces; Force-couple system; Resultant of a force system; Equilibrium conditions for a force system; Free body diagram; Different types of support reactions.

Plane Truss: Statically determinate trusses; Force analysis of a truss - method of joints, method of section and graphical method (Maxwell diagram)

Friction: Laws of dry friction; Co-efficient of friction; Angle and cone of friction; Angle of repose; Applications of friction—wedges and screw-jacks.

Distributed Forces: Line, area and volume distributions of forces; Centre of gravity; Centre of mass; Centroid of plane figure; Centre of composite figure.

Moment of Inertia: Area and mass moments of inertia; Perpendicular and parallel axes theorems of moment of inertia; Radius of gyration.

PART – II: DYNAMICS

Kinematics of Particles: Differential equations of kinematics – plane, rectilinear and curvilinear motions; Cartesian co-ordinate system; Normal and tangent co-ordinate system, projectile motion**.**

Kinetics of Particles: Newton's second law of motion; Work and energy principle – gravitational potential energy, elastic potential energy, kinetic energy, power, efficiency; Principle of impulse and momentum; Impact motion- direct central impact.

Rotation of Rigid Bodies: Kinematics of rotation; Kinetics of rotation- equation of motion, principle of work and energy; Principle of impulse and momentum.

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Plane Motion of Rigid Bodies: Translation of a rigid body in a plane; Kinematics of plane motion; Instantaneous center of rotation; Kinetics of plane motion – equation of motion, principle of work and energy; Principle of impulse and momentum.

Recommended Books:

Main Reading:

1. S. S. Bhavikatti, K. G. Rajashekarappa, Engineering Mechanics, New Age International publishers.
2. R. S. Khurmi, A Textbook of Engineering Mechanics, S. Chand & Company Ltd.

Supplementary Reading:

1. Meriam & Kraige, Engineering Mechanics [Vol-I & II], Wiley India.

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BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
TIUFY-205

L-T-P: 2-1-0 **Credit: 3**

MODULE 1: BASIC ELECTRICAL TECHNOLOGY

Introduction: Sources of energy; General structure of electrical power systems, Power transmission and distribution via overhead lines and underground cables, Steam, Hydel, Gas and Nuclear power generation.

DC Networks: Kirchoff's laws, node voltage and mesh current methods, Delta-star and star-delta conversion, Superposition principle, Thevenin's and Norton's theorems.

Single phase AC Circuits: Single phase EMF generation, average and effective values of sinusoids, solution of R, L, C series circuits, the j-operator, complex representation of impedances, phasor diagram, power factor, power in complex notation, solution of parallel and series – parallel circuits.

Three phase AC Circuits: Three phase EMF generation, delta and Y – connections, line and phase quantities, solution of three phase circuits, balanced supply voltage and balanced load, phasor diagram, measurement of power in three phase circuits, Three phase four wire circuits. Magnetic Circuits: Ampere's circuital law, B–H curve, solution of magnetic circuits, hysteresis and eddy current losses, relays, an application of magnetic force, basic principles of stepper motor.

Transformers: Construction, EMF equation, ratings, phasor diagram on no load and full load, equivalent circuit, regulation and efficiency calculations, open and short circuit tests, auto-transformers.

Induction Motor: The revolving magnetic field, principle of orientation, ratings, and equivalent circuit, Torque-speed characteristics, starters for cage and wound rotor type induction motors.

DC Machines: Construction, EMF and Torque equations, Characteristics of DC generators and motors, speed control of DC motors and DC motor starters. Electrical Measuring Instruments: DC PMMC instruments, shunt and multipliers, multimeters, Moving iron ammeters and voltmeters, dynamometer, wattmeter, AC watthour meter, extension of instrument ranges.

MODULE 2: BASIC ELECTRONICS ENGINEERING

Introduction to Electronic devices: passive devices, diode, bipolar junction transistor (BJT), metal oxide semiconductor field-effect transistor (MOSFET).

Diode: basic structure and operating principle, current-voltage characteristic, large and small-signal models, iterative and graphical analysis.

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Diode Applications: rectifier circuits (half-wave and full-wave rectifiers, rectifiers with capacitor filter), voltage regulator (using Zener diode), clipper (limiter) circuits, clamper circuits.

Bipolar Junction Transistors and their Applications: structure and modes of operation; n-p-n and p-n-p transistor in active mode, DC analysis of both transistor circuits; BJT as an amplifier, small-signal equivalent circuits, single-stage BJT amplifier (common-emitter mode); BJT as a switch.

Metal Oxide Semiconductor Field-Effect Transistors and their Applications: structure and physical operation of n-type and p-type MOSFET; DC analysis of MOSFET circuits; MOSFET as an amplifier, small-signal equivalent circuits, single-stage MOSFET amplifier (common-source mode); MOSFET as a switch.

Operational Amplifier (Op Amp): ideal op amp; inverting amplifier, amplifier with a T-network, effect of finite gain, summing amplifier; non-inverting configuration, voltage follower; op amp applications like current-to-voltage converter, voltage-to-current converter, difference amplifier, instrumentation amplifier, integrator and differentiator; Feedback: basic concepts of negative feedback; four ideal feedback topologies.

Oscillators: basic principles of sinusoidal oscillation; Example circuits.

Recommended Books:

Main Reading:

1. D. Chattopadhyay, P. C. Rakshit, Funndamentals of Electric Circuit Theory, S. Chand. Publications

2. D. Chattopadhyay, P.C. Rakshit, Electronics Fundamentals and Applications, New Age International Publisher

Supplementary Reading:

1. Salivahanan and P. Kumar**,** Circuit Theory, Vikas Publishing House
2. Kulshreshtha, Basic Electrical Engineering: Principles and Application, Tata McGraw-Hill.

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PROBLEM SOLVING AND PROGRAMMING USING C
TIUFY-206

: 2-1-0 **Credit: 3**

Introduction to Programming: The Basic Model of Computation, Algorithms, Flow-charts, Programming Languages, Compilation, Linking and Loading, Testing and Debugging, Documentation.

Algorithms for Problem Solving: Exchanging values of two variables, Summation of a set of numbers, Decimal Base to Binary base conversion, Reversing digits of an integer, GCD (Greatest Common Division) of two numbers, Test whether a number is prime, Organize numbers in ascending order, Find square root of a number, Factorial computation, Fibonacci sequence, Evaluate 'sin x' as sum of a series, Reverse order of elements of an array, Find largest number in an array, Print elements of upper triangular matrix, Multiplication of two matrices, Evaluate a Polynomial.

Introduction to C Language: Character set, Variables and Identifiers, Built-in Data Types, Variable Definition, Arithmetic operators and Expressions, Constants and Literals, Simple assignment statement, Basic input/output statement, Simple 'C' programs.

Conditional Statements and Loops: Decision making within a program Conditions, Relational Operators, Logical Connectives, if statement, if-else statement. Loops: while loop, do while, for loop, Nested loops, Infinite loops, switch statement, Structured Programming.

Arrays: One dimensional arrays: Array manipulation, Searching, Insertion, and Deletion of an element from an array, finding the largest / smallest element in an array; Two dimensional arrays, Addition/ multiplication of two matrices transpose of a square matrix, Null terminated strings as array of characters, Representation sparse matrices.

Functions: Top-down approach of problem solving; Modular programming and functions; Standard Library of C functions; Prototype of a function Formal parameter list, Return Type, Function call, Block structure; Passing arguments to a Function Call by reference, Call by value, Recursive Functions, Arrays as function arguments.

Structures and Unions: Structure variables, Initialization, Structure assignment, Nested structure, Structures and Functions, Structures and arrays: Arrays of structures, Structures containing arrays, Unions.

Pointers: Address operators, Pointers type declaration, Pointer assignment, Pointer initialization, Pointer arithmetic, Functions and pointers, Arrays and Pointers, Pointer arrays.

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Self-Referential Structures and Linked Lists: Creation of a singly connected linked list, traversing a linked list, Insertion into a linked list, Deletion from a linked list.

File Processing: Concept of Files, File opening in various modes and closing of a file, Reading from a file, writing onto a file.

Recommended Books:

Main Reading

1. B W Kernighan and D.M. Ritchie, The C Programming Language, Prentice Hall of India.
2. R G Dromey, How to solve it by Computer, Prentice Hall in India.
4. Anil BikasChaudhuri, The Art of Programming through Flowcharts & Algorithms, Firewall Media.

Supplementary Reading

1. Jones, Robin and Stewart, The Art of C Programming, Narosa Publishing House.
2. A Kenneth, C Problem solving and Programming, Prentice Hall International.
3. H. Schildt, C Made easy, McGraw Hill Book Company.

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CHEMISTRY LABORATORY
TIUFY-293

: 0-0-2 **Credit: 2**

Experiment 1: Acid-base titration involving molarity and normality

Experiment 2: Determination of solubility product

Experiment 3: Determination of kinetics of ester hydrolysis

Experiment 4: pH-metric or potentiometric titration

Experiment 5: Determination of partial molal volume of Ethanol/water mixture by spectrophotometry

Experiment 6: Measurement of the coefficient of viscosity

Experiment 7: Surface tension and Parachor

Experiment 8: Qualitative analysis- identification of the following in a given salt:

Cations: NH^{4+}, Pb^{2+}, Cu^{2+}, Al^{3+}, Fe^{2+}, Fe^{3+}, Zn^{2+}, Ca^{2+}, Mg^{2+} etc.
Anions: CO_3^{2-}, NO_2^-, SO_3^{2-}, SO_4^{2-}, NO_3^- etc.

Experiment 9: Identification of the following compounds and functional groups based on observations

Aliphatic compounds: formaldehyde; ethanol; acetic acid; acetone; glucose etc.

Aromatic compounds: benzoic acid; phenol; aniline; benzaldehyde etc.

Experiment 10: Separation of mixtures of organic compounds utilizing the concept of boiling point/melting point/solubility

Recommended Books:

Main Reading:

1. Paradis and Jeffrey, Hands on Chemistry Laboratory Manual, McGraw-Hill publication.

Supplementary Reading:

1. Garland and Crawl, Experiments in Physical Chemistry, McGraw-Hill Publication.

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INTRODUCTION TO MANUFACTURING PROCESS LAB
TIUFY-294

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

1. General safety precautions in workshop and introduction.

2. Carpentry Shop: Safety precaution, Kinds of wood and timber, Application of timber as per their classification, Carpentry hand tools and machines, Demonstration of wood working machine like, band saw, circular saw, thickness planner, wood working lathe, surface planners etc.

Exercise: Different types of carpentry joint.

3. Smithy Shop: Safety precaution, Different types of forging tools, Study of furnace, Operation in Smithy shop.

Exercise: A simple job on Smithy.

4. Welding Shop: Safety precaution in welding shop, Introduction to gas and arc welding, Soldering and brazing etc, welding equipment and welding material

Exercise: A simple job on gas/arc welding.

5. Pattern Moulding: Pattern making process, Types of pattern and their allowances and their uses, Moulding tools, Materials and moulding method.

6. Fitting Shop: Safety precaution, Introduction to fitting shop tools, equipment, Operation and their uses, marking and measuring practice.

Exercise: A simple job using fitting tools and equipments.

7. Turning and Machine Shop: Safety precautions, Demonstration and working principles of some of the general machines, like lathe, shaper, milling, drilling, grinding, slotting etc. General idea of cutting tools of the machines.

Exercise: A simple job on lathe/ shaper.

Recommended Books:

1. S. K. Hajra Choudhury, A. K. Hajra Choudhury, Nirjhar Roy, Elements of Workshop Technology (Vol. - 1)

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BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB
TIUFY-295

: 0-0-3 **Credit: 2**

Suggested Experiments:

1. To measure the armature and field resistance of a DC machine.
2. To calibrate a test (moving iron) ammeter and a (dynamometer) Wattmeter with respect to standard (DC PMMC) ammeter and voltmeters.
3. Verification of circuit theorems – Thevenin's and superposition theorems (with DC sources only).
4. Measurement of current, voltage and power in R-L-C series circuit exited by single phase) AC supply.
5. Open circuit and short circuit tests on a single phase transformer.
6. Connection and starting of a three phase induction motor using direct on line (DOL) or star – delta starter.
7. Connection and measurement of power consumption of a fluorescent lamp and voltage – current characteristics of incandescent lamps.
8. Determination of open circuit characteristics (OCC) or a DC generator.
9. Two wattmeter method of measuring power in three phase circuit (resistive load only)

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PROGRAMMING IN C LAB
TIUFY-296

: 0-0-3 **Credit: 2**

Suggested assignments on:

1. Familiarization of a computer and the environment and execution of simple programs
2. Expression evaluation
3. Conditionals and Branching
4. Iteration
5. Functions
6. Recursion
7. Arrays and Strings
8. Structures and Unions
9. File Handling

Approved By:
External Expert VC Registrar Dean of Academics Mentor of the Dept. HOD