

I B Tech CURRICULUM**SEMESTER I**

Code No.	Category	Subject	L T P	Credits
HU15*	H	Humanities and Language Elective I	2 0 2	3
PH100	S	Physics	3 0 0	3
CH100		Chemistry		
MA101	M	Calculus and Matrix Algebra	3 1 0	4
ME100	G	Engineering Mechanics	3 1 0	4
ME110		Thermodynamics	3 0 0	3
EE100	G	Electrical Engineering	3 0 0	3
IT101	G	Computer Programming	3 0 0	3
ME181	G	Engineering Drawing I	1 0 2	2
PH180	S	Physics Lab.	0 0 3	1
CH180		Chemistry Lab.		
ME180	G	Workshop A	1 0 2	2
EE180		Workshop B		
IT181	G	Computer Programming Lab.	0 0 3	1
HU100	H	Cultural Education	1 0 0	P / F

Credits: H=3 S=4 M=4 G=15/14 Total=26/25

SEMESTER II

Code No.	Category	Subject	L T P	Credits
HU15*	H	Humanities and Language Elective II	1 0 2	2
CH100	S	Chemistry	3 0 0	3
PH100		Physics		
MA102	M	Vector Calculus and Ordinary Differential Equations	3 1 0	4
ME110	G	Thermodynamics	3 0 0	3
ME100		Engineering Mechanics	3 1 0	4
EC100	G	Electronics Engineering	3 0 0	3
IT102	G	Object Oriented Programming	2 0 0	2
ME182	G	Engineering Drawing II	1 0 2	2
CH180	S	Chemistry Lab.	0 0 3	1
PH180		Physics Lab.		
EE180	G	Workshop B	1 0 2	2
ME180		Workshop A		
IT182	G	Object Oriented Programming Lab.	0 0 3	1
HU100	H	Cultural Education	1 0 0	P / F

Credits: H=2 S=4 M=4 G=13/14 Total=23/24

Water Technology: Water treatment – trace elements in water – water quality parameters and standards – sampling preservation and monitoring techniques. Boiler feed water – External and internal conditioning – boiler compounds –desalination by RO and electro dialysis.

Phase rule: Phase rule – statement and explanation of terms–one component system –water-vapour-ice – thermal analysis – condensed phase rule - Two component system – Ag – Pb – simple Eutectic -Cu – Au solid solution -liquid binary mixtures – completely miscible-partially miscible – immiscible liquids- Ellingham diagram and its application -extraction.

Spectroscopy: Significance of spectroscopy as analytical tool –Electromagnetic spectrum, intensities of spectral lines and the Beer-Lamberts law, Vibration of Diatomic molecules Energy levels- Principles of selection rules-Introduction to IR spectrum and its applications – Electronic spectra –Structural Elucidation of simple Organic compounds using UV and IR – Brief outline of H-NMR and its application.

Chemistry of corrosion and its control: Chemical and electro chemical corrosion –Pilling – Bed worth ratio – electrochemical series- galvanic series- corrosion potential – corrosion current – rate of corrosion – units of corrosion rate - determination – weight loss method. Corrosion control - cathodic and anodic protection.

Advanced Engineering Materials: Outline of –Bulk nanostructured materials and their significance – methods of synthesis – conducting polymer-types. Organic LEDs-their functioning-advantages and disadvantages over conventional LEDs-their commercial uses. Liquid crystals –positional and orientation order- classification of liquid crystals-requirement for substance to exhibit liquid crystalline state-chemical constitution-identification of liquid crystals-electro-optic effect in liquid crystals, application of liquid crystals.

Textbook:

1. “*Physical Chemistry*”, (5th edition) Gordon M Barrow, Tata McGraw-Hill, 2007
2. “*Engineering Chemistry*” PC Jain & Monika Jain, Dhanpatrai Publishing Co Ltd, New Delhi, 2005

References:

1. “*Corrosion Engineering*” (3rd edition) Fontana and Mars.G, McGrawhill, 1987.
2. ”*Spectrometric Identification of Organic Compounds*” (6th edition) Robert M Silverstein and Francis X Webster, Wiley & Sons, 2006.
3. “*Introduction to Nanotechnology*” Charles P Poole, Jr Franck J Owens, Wiley Interscience, 2003.
4. “*Liquid crystals*” A. Chandrasekar, Cambridge Univ Press, Cambridge, UK, 1992.

CH180**CHEMISTRY LAB.****0 0 3 1**

1. Estimation of Hardness of sample water.
2. Estimation of Calcium and Magnesium hardness of sample water.
3. Estimation of alkalinity of sample water.
4. Estimation of Dissolved oxygen of sample water.
5. Estimation of NaOH by conductometric titration.
6. Estimation of Fe^{2+} by potentiometric titration.
7. Determination of Single Electrode Potential.
8. Determination of Partition coefficient of Iodine.
9. Determination of Critical Solution Temperature phenol- water system.
10. Determination of Corrosion rate by weight loss method.
11. Inhibitor efficiency by weight loss method
12. Spectro photometric analysis of trace element (Fe) in water.
13. Desalination by Reverse osmosis
14. Preparation of liquid crystals.
15. Determination of molecular weight of polymer by viscosity method.
16. Determination of Flash and Fire points and Viscosity of a lubricant.

EE100**ELECTRICAL ENGINEERING****3 0 0 3**

Units, Electric Current, Coulomb's Law, Ohm's Law, Faraday's Law of Electromagnetic Induction, Kirchhoff's Laws, Ampere's Law.

Ideal Independent Current and Voltage Sources, Reference Directions and Symbols, Energy and Power, The Resistance Parameter, The Inductance Parameter, The Capacitance Parameter.

Series and Parallel Combinations of Resistances, Capacitances and Inductances, Series-Parallel circuits, Network Analysis by Mesh Currents and Node-Pair Voltages, The superposition Theorem, Thevenin's Theorem, Norton's Theorem: Voltage and Current sources, Conversion of a Voltage Source to a Current Source, Network Reduction by Δ -Y Transformation.

Concepts of switched DC RLC circuits, Steady State and Transient conditions, Time constant, Methods for determination of Transients.

Sinusoidal Functions-Terminology, Average and Effective Values of Periodic Functions, Instantaneous and Average Power. Power Factor, Phasor Representation of Sinusoids, Sinusoidal Steady-State Response of Single Elements-RLC, The Series RL Circuit, The Series RC Circuit, The RLC Circuit, Application of Network Theorems to Complex Impedances, Response, Balanced Three-Phase Circuit.

Magnetic Circuits: MMF, Magnetic Flux, Reluctance, Flux density, Analogy with electric circuits. Analysis of magnetic circuits. Self and mutual inductances, Expressions for self and mutual induced emfs.

Introduction to Electric Power Supply System.

Transformers: Construction and principle of operation of single phase transformer, Emf equation, Turns ratio. Principle of mmf balance, No load current, Principle of operation of auto-transformer.

Three-phase Inductor Motor: Types, construction, Rotating magnetic field, Principle of operation, Slip, Rotor induced emf. Rotor : frequency, Rotor reactance, Expression for torque developed from rotor input, Torque- Slip characteristics. Starters, Star-Delta starter, Applications.

Measuring Instruments, Different types of instruments to measure Voltage, Current, Power and Energy, Use of Multimeter, CRO.

Text Books :

1. Vincent Del Toro, Electrical Engineering Fundamentals, PHI, 2nd Ed, 2003.
2. Giorgio Rizzoni, Principle and Applications of Electrical Engineering, TMH, 2003, 4th Ed.

Reference Books:

1. Nagarath and Kothary-Electrical Machines – TMH, 1993.
2. H.S Kalsi, 'Electronic Instrumentation', TMH, 1995.

EC100	ELECTRONICS ENGINEERING	3 0
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Physics of conductors and semiconductors:- Conductors, Semiconductors, Silicon crystals, Intrinsic Semiconductors, Two types of flow, Doping a Semiconductor, Two types of Extrinsic Semiconductors, Unbiased Diode, Forward Bias, Reverse Bias, Breakdown, Barrier potential and Temperature, Reverse biased diode.

Rectifiers and diodes:- Half wave, Full wave and Bridge Rectifiers. Filters, Choke input filter, Capacitor input filter PIV and surge current, Zener Diode, Loaded Zener Regulator, Photo diodes, Schotkey, Varactor, LED and LCD diodes.

Basics of Amplifiers:- Introduction to BJT and FET, Static and Dynamic characteristic curves, Biasing in the ohmic region, and active region, Transconductance, JFET Amplifiers, Depletion mode and Enhancement mode MOSFET, CMOS

Operational amplifiers:- Differential amplifier, Introduction to Opamps, 741 Opamp. Inverting and non inverting amplifier, Comparators, Instrumentation amplifier, summing amplifier, Opamp as surface mount devices, Linear IC

Oscillators:- Theory of sinusoidal Oscillations, Wein Bridge Oscillator, Collpits Oscillator, Quartz Crystal, Introduction to 555 Timer, Astable operation. Monolithic Linear Regulators.

Introduction to Logic circuits:- Binary Logic Boolean algebra, Venn diagram, De Morgans laws, Basic gates and universal gate, Memory element, Latch, SR, JK Flip-Flop, Shift Register, Number systems Binary, Octal, BCD, Hex. Addition and subtraction using 2's complement.

Analog to Digital conversion:- Basics of Analog to Digital converter, Digital to analog converter, Data acquisition systems, Multiplexing, sample and hold circuits.

Introduction to communication systems:- Basic Block diagram of communication systems, definitions of AM and FM, comparison between AM and FM

Text Books:

1. A.P Malvino, Electronic Principles, 5th Edition, TMH
2. M Morris Mano, Digital Design, PHI
3. George Kennedy, Electronic Communication Systems, TMH

Reference Book:

1. J Millman and C C Halkias, Electronics Devices & Circuits, McGraw Hill
2. Malvino and Leach, Digital Electronic Principles, McGraw Hill

EE180	WORKSHOP PRACTICE B	1 0 2 2
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Electrical Workshop: (4 Classes)

Study of safety devices such as fuse, MCB, ELCB & Earthing – Electrical power distribution in domestic installations, study of tools and accessories used in electrical wiring – Wiring practice for staircase circuit, fluorescent lamp, hospital wiring and godown lighting – study of domestic appliances like Mixie, fan, Electric iron, Air Conditioner, Refrigerator – study of different types of electric lamps like Incandescent lamp, Fluorescent, CFL, Metal halide, Mercury vapour, Sodium vapour and halogen lamp.

Personal computer hardware workshop: (2 classes)

Study of basic components in a computer - study of basic components in a network – study of diagnostic tools for system and study of floppy disk controller – study of hard disk controller – Drivers for different components – Trouble shooting in printer – Communication between two computers with null modem – Transferring characters from PC to LCD.

Electronics and Basic microprocessor Workshop: (4 classes)

Identification of electronic components and study of measuring instruments – PCB fabrication and soldering practice – Study of intel 8085 microprocessor trainer kit concepts.

PIC Microcontroller Workshop: (2 classes)

Introduction to MP lab simulator. Simulating and burning simple programmes on PIC 16F877A.

HU100	CULTURAL EDUCATION	1 0 0 P/F
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Professional & Personal Ethics, Humane Values, Cultural & Spiritual Values, Personality development, Stress Management, Identifying Role Models, Resolution of Personal and Social Conflicts etc.

Reference: General Reference & Class Notes

HU151	COMMUNICATIVE ENGLISH (offered at ASE – Coimbatore)	2 0 2 3
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Language through reading: An Anthology compiled by the University to represent different styles of communication – motivating critical thinking and analysis – basics of continuous writing.

Language through practice: A workbook comprising essential grammar and usage topics.

Practical sessions: Introduction to English pronunciation including minimal pairs and word stress– differences between British and American English – Listening comprehension activities.

Activities: Short speeches, seminars, quizzes, language games, debates, and discussions etc.

References:

1. Raymond Murphy. “Murphy’s English Grammar”, Cambridge Univ. Press, 2004.
2. Michael Swan. “Practical English Usage”, Oxford Univ. Press, 2000.
3. Daniel Jones. “Cambridge English Pronouncing Dictionary” Ed. Peter Roach, Jane Setter and James Hartman, Cambridge Univ Press, 2006.

HU152	PROFESSIONAL COMMUNICATION (offered at ASE – Coimbatore)	1 0 2 2
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Reading Comprehension: Focus will be on understanding of the given information, vocabulary, inference, logical thinking, and decision- making.

Work place Communication: Writing suggestions, recommendations - reports like, incident report, progress report, trip report, feasibility report – resume writing - formal and business letters – memos, circulars, notices - agenda, meetings, minutes.

Practical: Telephonic conversations, interviews, group and panel discussions, and oral presentations.

References:

1. Davis Homer & Peter Strutt. "Words at Work", CUP, 1996.
2. Simon Sweeney. "Communicating in Business", CUP, 2000.
3. Leo Jones & Richard Alexander. "New International Business English" CUP, 2003.
4. Raymond V Lesikar & Marie E. Flatley. "Basic Business Communication", Tata McGraw-Hill Pub. Co. New Delhi, 2005. Tenth Ed.

MA101**CALCULUS AND MATRIX ALGEBRA****3 1 0 4**

Calculus: Formal Definition of Limits, Extension of Limit Concepts, Continuity, Tangent Lines, Derivative, Function of a Function Rule, Indeterminate Forms, Application of Derivatives - Rolle's Theorem, Mean Value Theorem. Sequences and Series, Riemann Sums and Definite Integrals and their Applications, Introduction to improper integrals, Leibniz's Rule (Differentiation under Integral Sign), Notion of Convergence- Absolute Convergence of Infinite Series. Tests for Convergence-Ratio Test, Root Test-Series of Positive and Negative Terms-Idea of Absolute Convergence-Test for Alternating Series-Power Series. Taylor's and Maclaurin's Series (without proof), Applications of Power Series. Periodic Functions, Trigonometric Series, Introduction to Fourier Series, Dirichlet's Conditions, Convergence, Even and Odd Functions, Half Range Expansions.

Matrix Algebra: Review of Matrix algebra, Systems of Linear Equations, Gauss Elimination. Rank of a Matrix, Linear Independence, Solutions of Linear Systems: Existence, Uniqueness, General Form; Inverse of a Matrix, Gauss-Jordan Elimination; Matrix Eigen value Problems, Eigen values, Eigenvectors, Some Applications of Eigen value Problems, Symmetric, Skew-Symmetric and Orthogonal Matrices, Unitary Matrices, Quadratic Forms, Similarity of Matrices, Basis of Eigenvectors, Diagonalization.

Textbooks:

1. 'Calculus', G.B. Thomas and R. L Finney, Pearson Education, 1996, Ninth Edition.
2. 'Advanced Engineering Mathematics', E. Kreyszig, John Wiley and Sons, 2002, 8th Ed.

References:

1. 'Introduction to Calculus and Analysis', R. Courant and F John, Springer, Vol 2.
2. 'Advanced Engineering Mathematics', Michael D Greenberg, Second Edition, Pearson Education, 1998

MA102**VECTOR CALCULUS AND ORDINARY DIFFERENTIAL EQUATIONS****3 1 0 4**

Functions of two variables: Partial Derivatives, Total Derivatives, Differentials, Chain Rule (Two Variables).

Vector Calculus: Double Integrals in Rectangular Coordinates and Polar Coordinates, Triple Integrals in Rectangular Coordinates. Vector and Scalar Functions and Fields, Derivatives, Curves, Tangents, Arc Length, Gradient of a Scalar Field, Directional Derivative, Divergence

and Curl, Line Integrals, Surface and Volume Integrals, Green's, Gauss Divergence and Stokes's Theorems (without proof).

Ordinary Differential Equations: First Order Differential Equations: Basic Concepts and Ideas, Classification as Linear and Nonlinear Equations, Elementary Ideas of Existence and Uniqueness of Solutions, Exact Differential Equations, Integrating Factors, Linear Differential Equations, Bernoulli Equation, Orthogonal Trajectories Of Curves.

Linear Differential Equations of Second Order: Linear Equations of Second Order, Initial Value Problem, Second Order Homogeneous Linear Equations with Constant Coefficients, Euler-Cauchy Equation, Existence and Uniqueness Theory, Non-Homogeneous Equations, Solution by Variation of Parameters. Systems of Differential Equations: Introductory Examples, Basic Concepts and Theory, Homogeneous and Non - Homogeneous Systems with Constant Coefficients.

Textbooks:

1. 'Calculus', G.B. Thomas and R. L. Finney, Pearson Education, 1996, Ninth Edition.
2. 'Advanced Engineering Mathematics', E Kreyszig, John Wiley and Sons, 2002, Eighth Edition.

References:

1. 'Advanced Engineering Mathematics', M D Greenberg, Pearson Education, 1998, Second Edition.
2. 'Advanced Engineering Mathematics', Ray Wiley and C. Barret, John Wiley and Sons, 2003, Sixth Edition.

ME100	ENGINEERING MECHANICS	3 1 0 4
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Principles of Statics - Introduction to Vector approach - Free body diagrams -Equilibrium of particle - Equilibrium of forces in space.

Statics of rigid bodies: Rigid body equilibrium – Support reactions.

Applications of Statics - Analysis of trusses – method of joints– method of sections.

Centroids, Centre of gravity: Centroids of areas, lines, volumes – Composite bodies

Moment of Inertia: Second moment of area – Polar moment of inertia - Radius of gyration - Introduction to mass moment of inertia and Product of inertia.

Basic principle of virtual work for rigid bodies - Simple problems

Dynamics of rigid bodies: Translation and rotation of rigid bodies – Chasle's Theorem- Derivative of a vector fixed in a moving reference - General plane motion - Applications of the fixed-vector concept - General relationships between time derivatives of a vector for different references - Relationship between velocities of a particle for different references - Acceleration of a particle for different references - Simple problems.

Moment of momentum equations - Pure rotation of a body of revolution about its axis of revolution - Simple problems.

Text Books:

1. Shames, I. H, "Engineering Mechanics - Statics and Dynamics", Fourth edition, 2003, Pearson Education Pte Ltd .
2. Beer, F.P& Johnston, E.R, "Vector Mechanics for Engineers-Statics and Dynamics" Fifth edition, 2003, McGraw Hill International Book Co.

Supplimentary Text Books:

1. Hibbeler, R.C., "Engineering Mechanics", Third edition, 2004, Pearson Education Pte Ltd.
2. Meriam, J.L., "Dynamics", Wiley Eastern Pte Ltd.
3. K.L.Kumar., "Engineering Mechanics", Third Edition, Tata Mc Graw Hill.

ME110 THERMODYNAMICS (tentative - awaiting experts' comments) 3 0 0 3

Concepts and Definitions- A thermodynamic system - Properties and State of Substance - Processes and Cycles - Units of Measurement - Specific volume, density, pressure and temperature, Zeroth Law of Thermodynamics

Properties of Pure Substance-Vapour- Liquid- Solid Phase Equilibrium - P-V-T behaviour of low and moderate density gases

Work and Heat -Definition of work - units for work and work done at the moving boundary – Examples. Definition of Heat and Heat transfer modes - Heat and Work

First Law of Thermodynamics.-When a control mass undergoing a cycle - When a control mass undergoes a change of state, Thermodynamic properties: Internal energy, Enthalpy, Specific Heat, Conservation of Mass

Second Law of Thermodynamics.- Heat Engines and Refrigerators - Kelvin - Plank statement - Clausius statement - Reversible processes - Friction and unrestrained expansion - The Carnot Cycle, Efficiency of Carnot Cycle - Ideal Gas Temperature scale

Entropy - The inequality of Clausius - Entropy as a property of a system - Entropy change in reversible processes - Thermodynamic Property relation

Text Book:

Sonntag, Borgnakke and Van Wylen "Fundamentals of Thermodynamics" Fifth edition,2003, John Wiley & Sons, Inc.

Reference:

Yunus A.Cengel and Michael A. Boles " Thermodynamics an Engineering Approach" Fifth Edition,2006, Tata McGraw-Hill Publishing Company Ltd.

ME180**WORKSHOP PRACTICE A****1 0 2 2****1. Product Detailing Workshop: (3 classes)**

(Study of simple mechanical and electromechanical system)

Disassemble the product or sub assembly-Measure various dimensions using measuring instruments-Free hand rough sketch of the assembly and components- Name the components and indicate the various materials used-Study the functioning of the assembly and parts-Study the assembly and components design for compactness, processing, ease of assembly and disassembly-Assemble the product or subassembly.

2. Pneumatics and PLC Workshop: (3 classes)

Study of pneumatic elements-Design and Assembly of simple circuits using basic pneumatic elements-Design and Assembly of simple circuits using Electro-pneumatics.Study of PLC and its applications-Simple programming using ladder diagrams.

3. Sheet metal Workshop: (3 classes)

Study of tools and equipment-Draw development drawing of simple objects on sheet metal (cone, cylinder, pyramid, prism, tray etc.)-Fabrication of components using small shearing and bending machines-Riveting and painting practice.

4. a) Welding Workshop: (2 classes)

Study of tools and equipment-Study of various welding methods-Arc welding practice and demonstration of gas welding and cutting.

b) Demo and practice Workshop: (1 class) - (Not for assessment)**Fitting:** Study of tools, practice in chipping, filing and making joints.**Carpentry:** Study of tools, planning practice and making joints.**References:**

Concerned Workshop Manual.

ME181**ENGINEERING DRAWING I****1 0 2 2**

Use of drawing instruments-Drawing practice-Lettering-Dimensioning-Sketching.

Orthographic Projections - Projection of Points; Projection of Lines; Projection of Planes; Projection of solids

Section of Solids; Intersection of Solids; Development of Surfaces.

Orthographic views of three-dimensional solids

Isometric Projection

References:

1. Bhat N.D. and Panchal V.M. – Engineering Drawing – Plane and solid Geometry, 42e, Charoatar Publishing House, 2000
2. James D. Bethune, Engineering Graphics with AutoCAD, 2002, Pearson Education, First reprint,2003
3. K.C.John, Engineering Graphics, Jet Publications,2003
4. Narayana K.L.& Kannaiah P, Engineering Graphics, SciTech publications, Chennai,2003

5. Waran J Luzadder and John M Duff, Fundamentals of Engineering Drawing, 11e, Prentice Hall of India, New Delhi, 1995
4. K.R.Gopalakrishna, Engineering Drawing, 2003, Subhas Publications

ME182	ENGINEERING DRAWING II	1 0 2 2
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Introduction to CAD & CADian software
 Preparation of Drawings using - Draw Commands; Modify Commands; Dimension & Style commands; Info and view Commands; Utility Commands; Advanced Commands.
 Introduction to VBA
 3D Modeling Methods
 Surface Modeling Methods

References:

CADian Manual

PH100	PHYSICS	3 0 0 3
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Physics Review: Newton's Laws, Galilean relativity, work and energy, rotations and angular momentum, conservation laws: mass, energy, momentum, and angular momentum, electricity and magnetism, Maxwell equations

Special Relativity: Maxwell equations, Michelson-Morley experiment, Einstein's postulates, operational definitions of space and time, synchronicity, time dilation, length contraction, Doppler effects, relativistic addition of velocities, relativistic momentum, relativistic energy, relativistic mass

Properties of Light: electromagnetic waves, black body radiation, photoelectric effect, what is light, x-rays, x-ray diffraction, Compton effect, pair production

Wave properties of particles: DeBroglie waves, describing waves, waves of what, phase and group velocity, the double slit diffraction experiment, uncertainty principle, complementarity and duality

Atomic Structure: review of Rutherford experiment, review of spectroscopy, the Bohr Atom, energy levels, correspondence principle, atomic excitation, lasers

Quantum Mechanics: The Schrodinger wave equation, linearity and superposition, expectation values and operators, particle in a box, the finite potential well, the tunnel effect

Quantum Theory of the Hydrogen Atom: T

he three hydrogen quantum numbers, comparison of QM hydrogen atom to Bohr atom, a qualitative look at the hydrogen wave functions, electron probability density, angular momentum quantum numbers, radiative transitions, selection rules, the Zeeman effect. Discussion of Harmonic oscillator(Qualitative)

Many Electron Atoms:, electron spin, the Stern Gerlach experiment, the binary nature of electron spin and the possibility of quantum computing, the Pauli exclusion principle, symmetric and antisymmetric wave functions, explaining the periodic table, atoms and molecules

Statistical Mechanics and Solid state physics: The three distribution functions: Maxwell Boltzman, Bose Einstein, and Fermi-Dirac, Specific heats of solids, free electron theory of metals, the Fermi level, Band theory of Solids that explains the nature of conductors, semiconductors, and insulators, overview of superconductivity

Overview of nuclear and elementary particle physics: the four basic forces of nature, the standard model of elementary particles, radioactivity, nuclear reactions, energy of the sun, history of the universe

Text Book:

1. A Beiser, *Concepts of Modern Physics*(6th Edition) Tata Mc Graw Hill 1996

Reference Books:

1. S H Patil, *Elements of Modern Physics*, Tat Mc Graw Hill(1989)
2. A W Joshi *et al*, *World view of Physics*, South Asian Publishers, 1999
3. F K Richtmyer, E H Kennard, J N Cooper, *Introduction to Modern Physics*(6th Edition) Tata Mc Graw Hill, 1995.
4. T Thornton and A Rex, “*Modern Physics for Scientists and Engineers*”, Fort worth: Saunders, 200(2nd Edition)
5. Richard Feynman, Robert B Lighton & Mathew Sands, “*The Feynman Lectures on Physics*(Vol III), Addison Wesley Publication, Inc,1996.

PH180	PHYSICS LAB.	0 0 3 1
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List of Experiments

1. Torsional Pendulum
2. Co-efficient of Viscosity of liquid
3. Young’s Modulus –Non-Uniform Bending
4. Determination of Particle size using laser
5. Dispersive power of prism
6. Newton’s Ring
7. Meter Bridge
8. Frequency of AC
9. Temperature coefficient of resistance
10. Energy gap of a semiconductor.

IT101**COMPUTER PROGRAMMING****3 0 0 3**

Introduction to problem solving – Algorithm development, Flowcharting. C Fundamentals, Datatypes, Variables, Constants, Enumerations, Operators, Bitwise operators, Expressions, Type cast, Data Input and Output Statements- formatted & unformatted, Control Structures – if, if else, switch .. case, while loop, do .. while, for loop, continue, break, goto.

Arrays – Defining an array, Processing an array, Multidimensional arrays, Strings, String handling functions.

User Defined functions – Defining a function, Function prototypes, calling a function, passing arguments to a function, Recursion. Variable scope – auto, extern, static, register.

Pointers – Declarations, call by reference, Functions returning pointer, Pointer Arithmetic. Pointer to pointer, Pointers and Arrays – pointer to array, array of pointers, Pointers to functions, passing functions to other function, Dynamic memory allocation – malloc(), calloc(), free().

Structures – Declaration, Initialization, bitfields, Operations on structures. Arrays, pointers and structures as members of structure. Array of structures, structures and functions, Pointers to structures

Files – file operations for binary and text files, file I/O statements – fscanf, fprintf, fread, fwrite. Random file access – rewind, ftell, fseek. Command line arguments. Preprocessor – Macros.

Text Book:

1. Byron S Gottfried, “Schaum’s Outline of Theory and Problems of Programming with C”, 2nd Edition, TMH publishers, 1996.

Reference books:

1. Herbert Schildt, “The Complete reference, C” 4th Edition, Tata-McGraw-Hill, 2000.
2. Kernighan Brian W & Ritchie Dennis M, “C Programming language”, 2nd edition, TMH, 1992.
3. Yashavant Kanetkar, “Let us C” , 2nd edition, TMH, 1996.
4. Cooper Herbert , ”Spirit of C : Introduction to modern Programming”, TMH, 1983.

IT102**OBJECT ORIENTED PROGRAMMING****3 0 0 3**

Comparison of various programming methodologies, OOPS concepts, C and C++, Compilers for C++,

Structure of a C++ program, Revision of Data types, Control Statements, Arrays.

Insertion and Extraction Operators, Manipulators

Structures, Functions within structures, Access Specifiers
Classes and Objects, Array within a class, Array of Objects.
Scope resolution operator, Inline functions, Static class members
References and Reference Parameters, Default arguments
Pointers and Dynamic Memory allocation with new and delete operators
Constructors and Destructors, Friend functions
Objects as members of classes, Friend classes

Function overloading, overloading a constructor, this pointer
Operator overloading with member functions and friend functions
Overloading stream insertion and stream extraction operators
Type Conversion

Inheritance, Types of inheritance, Function Overriding, Virtual base class, Run Time
Polymorphism, Virtual Functions, Pure virtual function, Abstract class.

Files & File handling, Templates Function Templates and Class templates,
Exception Handling

Text Book:

Robert Lafore, "Object Oriented Programming in C++", 4th Edition, SAMS, 2002

Reference Books:

1. Herbert Schildt, "The Complete reference, C++ " 4th Edition, Tata-McGraw-Hill, 2003.
2. Harvey M. Deitel, Paul J. Deitel, "C++ How to Program", 4th Edition, Pearson Education 2002
3. Eric Nagler, "Learning C++: A Hands on Approach", 3rd Edition, Jaico, 2004
4. Bjarne Stroustrup, "C++ Programming Language", Special 3rd Edition, Addison Wesley Professional, 2000

IT181**COMPUTER PROGRAMMING LAB.****0 0 3 1**

1. Programs using various input/output statements (scanf, printf, getchar, gets, puts, putchar)
2. Programs using bitwise operators and enumerated data types
3. Programs using control structures (if, if else, switch, & loops)
4. Programs using numeric one dimensional array
5. Programs using numeric multidimensional array
6. Programs using strings & string handling functions
7. Functions using static, external and auto variables
8. Programs using Recursive functions
9. Programs using Call by reference and pointer arithmetic
10. Pointer to array & array of pointers using dynamic memory allocation
11. Structures – arrays, structure within structure
12. Array of structures, unions
13. Programs using text files
14. Programs using binary files

15. Programs using random access of files
16. Programs using Command line arguments

IT182	OBJECT ORIENTED PROGRAMMING LAB.	0 0 3 1
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1. Program to implement Input / Output Statements, Manipulators
2. Program using Structures, Functions within Structures
3. Program using Classes and Objects
4. Program using Static data member, Static functions and Functions with reference arguments
5. Program using Constructors and Destructors, Default arguments
6. Program using Friend Functions, Friend Classes
7. Program using Function Overloading, Overloading a constructor
8. Program using Operator Overloading
9. Program to implement Type Conversion
10. Program to implement Inheritance
11. Program to implement Virtual Functions
12. Program using Files, implement Templates and Exception Handling