

SYLLABUS
FOR
FIRST YEAR

B.TECH PROGRAMMES
(Effective from 2023-24)

MBA PROGRAMME
INTEGRATED MBA PROGRAMME
MCA PROGRAMME
(Effective from 2024-25)



2024-25
BIJU PATNAIK UNIVERSITY OF TECHNOLOGY, ODISHA
ROURKELA

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SYLLABUS

FOR

FIRST YEAR

B.TECH PROGRAMME

(Effective from 2023-24)

2024-25

**BIJU PATNAIK UNIVERSITY OF TECHNOLOGY, ODISHA
ROURKELA**

COURSE STRUCTURE

COMMON TO ALL BRANCHES

FIRST SEMESTER

Category	Subject Code	Subject	L-T-P	Credit	University Marks	Internal Marks
THEORY						
1.	BS 23BS1001	Mathematics - I	3-0-0	3	100	50
2.	BS 23BS1002	Physics /	3-0-0	3	100	50
	BS 23BS1003	Chemistry				
3.	ES 23ES1001	Basic Electrical Engineering /	2-0-0	2	100	50
	ES 23ES1002	Basic Electronics				
4.	ES 23ES1003	Programming in C and Data Structure /	3-0-0	3	100	50
	ES 23ES1004	Engineering Mechanics				
5.	ES 23ES1005	Basic Civil Engineering /	2-0-0	2	100	50
	ES 23ES1006	Basic Mechanical Engineering				
6.	HS 23HS1001	Universal Human Values /	2-0-0	2	100	50
	HS 23HS1002	English for Technical writing				
Total			15-0-0	15	600	300
SESSIONAL / PRACTICAL						
7.	BS 23BS1201	Physics Lab. /	0-0-3	1.5	-	100
	BS 23BS1202	Chemistry Lab.				
8.	ES 23ES1201	Basic Electrical Engineering Lab./	0-0-3	1.5	-	100
	ES 23ES1202	Basic Electronics Lab.				
9.	ES 23ES1203	Programming Lab. /	0-0-3	1.5	-	100
	ES 23ES1204	Communicative English & Report Writing Lab.				
10.	ES 23ES1205	Engineering Graphics & Design Lab. /	0-0-3	1.5	-	100
	ES 23ES1206	Workshop & Digital Manufacturing Lab.				
11.	MC 23MC1201	Sports / Yoga / NCC / NSS	0-0-2	1	-	100
Total			15-0-14	07	-	500
Total Semester				22	600	800
Grand Total (Theory + Practical) = 1400						

SECOND SEMESTER

Category	Subject Code	Subject	L-T-P	Credit	University Marks	Internal Marks
THEORY						
1.	BS 23BS1004	Mathematics - II	3-0-0	3	100	50
2.	BS 23BS1003	Chemistry /	3-0-0	3	100	50
	BS 23BS1002	Physics				
3.	ES 23ES1002	Basic Electronics /	2-0-0	2	100	50
	ES 23ES1001	Basic Electrical Engineering				
4.	ES 23ES1004	Engineering Mechanics /	3-0-0	3	100	50
	ES 23ES1003	Programming in C and Data Structure				
5.	ES 23ES1006	Basic Mechanical Engineering /	2-0-0	2	100	50
	ES 23ES1005	Basic Civil Engineering				
6.	HS 23HS1002	English for Technical writing /	2-0-0	2	100	50
	HS 23HS1001	Universal Human Values				
Total			15-0-0	15	600	300
SESSIONAL / PRACTICAL						
7.	BS 23BS1202	Chemistry Lab. /	0-0-3	1.5	-	100
	BS 23BS1201	Physics Lab.				
8.	ES 23ES1202	Basic Electronics Lab./	0-0-3	1.5	-	100
	ES 23ES1201	Basic Electrical Engineering Lab.				
9.	ES 23ES1204	Communicative English & Report Writing Lab. /	0-0-3	1.5	-	100
	ES 23ES1203	Programming Lab.				
10.	ES 23ES1206	Workshop & Digital Manufacturing Lab. /	0-0-3	1.5	-	100
	ES 23ES1205	Engineering Graphics & Design Lab.				
11.	MC 23MC1202	Sports / Yoga / NCC / NSS	0-0-2	1	-	100
Total			15-0-14	07	-	500
Total Semester				22	600	800
Grand Total (Theory + Practical) = 1400						

23BS1001 MATHEMATICS - I (3-0-0)

Course Objective : The goal of this course is to achieve conceptual understanding and to retain the best traditions of traditional calculus. The syllabus is designed to provide the basic tools of calculus mainly for the purpose of modeling the engineering problems mathematically and obtaining solutions. This is a foundation course which mainly deals with topics such as single variable and multivariable calculus and plays an important role in the understanding of science, engineering and also other disciplines.

Module - I (08 hrs)

Basic Calculus: Applications of definite integrals to evaluate length of curves, areas of surfaces and volumes of surfaces of revolution, Improper integral (Definition and Elementary Examples), Beta and Gamma functions and their properties.

Module - II (08 hrs)

Single-variable Calculus (Differentiation): Rolle's Theorem, Mean value theorem (Statement and applications), First derivative test for local extreme values of functions. Power series, Taylor and Maclaurin series.

Module - III (08 hrs)

Multivariable Calculus (Differentiation): Partial derivatives. Jacobians, Hessian Matrix. Maxima, Minima and saddle points. Method of Lagrange multipliers.

Module - IV (08 hrs)

Linear Algebra: Vector Space, Basis and dimension, Linear Systems of Equations, Gauss elimination, Linear Dependence and Independence, Rank of a Matrix.

Module - V (08 hrs)

Linear Algebra: Inverse of a matrix (Gauss-Jordan). Symmetric, skew-symmetric and orthogonal matrices. Eigen values and eigenvectors. Cayley-Hamilton Theorem (Statement only)

Essential Reading:

1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, 2002.
2. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.

Supplementary Reading:

1. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.
2. Gilbert Strang, Introduction to Linear Algebra, 5th Edition, 2016.
3. Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi, 2008.

Course Outcomes:

CO1: To apply differential and integral calculus to notions of curvature and to improper integrals. Apart from some other applications they will have a basic understanding of Beta and Gamma functions.

- CO2: The fallouts of Rolle's Theorem that is fundamental to application of analysis to Engineering problems.
- CO3: The tool of power series for learning advanced Engineering Mathematics.
- CO4: To deal with functions of several variables that are essential in most branches of engineering.
- CO5: Learn how to convert a real life problem into a matrix system and solve it.

23BS1002 PHYSICS (3-0-0)

Course Objective: To enhance the fundamental knowledge in Physics and its applications relevant to various streams of Engineering and Technology.

Module I (09 Hrs)

OSCILLATIONS : Mechanical and electrical simple harmonic oscillators, damped harmonic oscillator – heavy, critical and light damping, energy decay in a damped harmonic oscillator, quality factor, forced mechanical and electrical oscillators, steady state motion of forced damped harmonic oscillator

Module II (09 Hrs)

WAVES AND OPTICS : Concept of wave and Wave equation, Superposition of many harmonic waves, Concept of coherent sources (Division of wave front and division of amplitude), Interference in thin parallel film, Newton's ring: Determination of wavelength of light, Refractive index of liquid). Concept of diffraction (Huygen's Principle), Types of diffraction, Fraunhofer diffraction due to single slit, diffraction grating (qualitatively).

Module III (09 Hrs)

ELECTROMAGNETISM : Vector calculus: Gradient, Divergence, Curl (Mathematical concept), Gauss divergence theorem and Stoke's theorem(statement only), Derivation of Maxwell's electromagnetic equation in differential form and integral form, Electromagnetic wave equations for E and B in vacuum and conducting medium, transverse nature of EM waves.

Module IV (09 Hrs)

QUANTUM PHYSICS : Wave particle duality, concept of phase velocity group velocity, relation between them, Matter waves (de Broglie hypothesis), Wave functions, Observables as operators, Eigen function and Eigen values, Normalization, Expectation values, Schrodinger equation (Time dependent and time independent), Particle in a box.

Module V (08 Hrs)

LASERS : Introduction to Laser, Characteristics of Lasers, Einstein's coefficients and relation between them, Lasing action, Population inversion, Three and four level pumping schemes, Ruby Laser, He-Ne Laser.

Essential / Supplementary Readings:

1. Ian G. Main, Oscillations and waves in physics, Cambridge University Press
2. H.J. Pain, The physics of vibrations and waves, John Wiley & Sons Ltd.
3. E. Hecht, Optics, Pearson Education Ltd.
4. A. Ghatak, Optics, McGraw Hill Publisher
5. O. Svelto, Principles of Lasers, Springer

- Course Outcome:** At the end of this course students will demonstrate the ability to
- CO1: Demonstrate proficiency and perceptiveness of the basic concepts in physics.
- CO2: Utilize the scientific and experimental methods to investigate and verify the concepts related to content knowledge.
- CO3: Exploring the engineering applications and apply quantum mechanics to engineering Phenomena.
- CO4: Identifying the relevant formulae and work out engineering problems.
- CO5: Comprehend principle, concept, working and application of new technology and comparison of results with theoretical calculations.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2	2	1	1	1	1	1	2	1
CO2	3	3	3	2	1	2	1	1	1	1	1	2
CO3	3	3	3	3	1	1	2	1	1	1	1	2
CO4	3	3	3	2	1	1	1	2	1	1	2	2
CO5	3	3	2	3	2	1	1	2	2	2	1	2

23BS1003 CHEMISTRY (3-0-0)

Module-I: (9Hours)

PERIODIC PROPERTIES : Periodic Properties, Effective Nuclear Charge, Penetration of Orbitals, Variations of s, p, d and f Orbital Energies of Atoms in the Periodic Table, Electronic Configurations, Atomic and Ionic Sizes, Ionization Energies, Electron Affinity and Electronegativity, Polarizability, Oxidation States.

Module-II: (9 Hours)

FREE ENERGY IN CHEMICAL EQUILIBRIA : Concepts of Entropy, Entropy in Physical and Chemical Changes, Free Energy Concepts, Gibbs Helmholtz Equation, Free Energy Change and Criterion of Spontaneity of Chemical Equation and Chemical Equilibrium, Van't Hoff Equation.

Module-III: (9 Hours)

SPECTROSCOPIC TECHNIQUES AND APPLICATIONS : Basic Terms and Principles of Spectroscopy Molecular Rotational (Microwave) Spectroscopy: Basic Principle and Application to Diatomic Molecules, Selection Rules.

Molecular Vibrational (IR) Spectroscopy: Basic Principle, Types of Vibrations , Vibrational Frequency, Selection Rules.

Electronic (UV-Visible) Spectroscopy: Laws of Absorption, Basis Principle, Types of Electronic Transitions, Chromophores and Auxochrome.

Module-IV: (9 Hours)

STEREOCHEMISTRY : Structural and Stereoisomer (Geometrical and Optical), Symmetry and Chirality, Enantiomers, Diastereomers, Optical Activity, Configurational and Conformational Analysis, Representations of Three Dimensional Structures (E, Z and R,S only).

Module-V: (9 Hours)

ORGANIC REACTIONS AND SYNTHESIS : Introduction to Reaction Intermediates {Carbocation, Carbanion, Free Radical (Formation, structure and stability)}, Reactions involving Substitution, Addition, Elimination (Examples and Mechanisms).

Essential Reading:

1. Engineering Chemistry: fundamental to Applications by Shikha Agarwal, Cambridge University Press, Second Edition, 2019.
2. Engineering Chemistry by B. Rama Devi, P. Aparna, and Prasanta Rath, Cengage Learning, First Edition, 2023.

Supplementary Reading:

1. Atkins' Physical Chemistry by Peter Atkins, Julio de Paula, and James Keeler, Oxford University Press, Eleventh Edition, 2018.
2. Principles of Physical Chemistry by B. R. Puri, L. R. Sharma, and Madan S. Pathania, Vishal Publishing, Forty Eighth Edition, 2021.
3. Fundamentals of Molecular Spectroscopy by C.N. Banwell and E.M. MacCash, 5th Edition, McGraw-Hill Education, Fourth Edition, 2017.
4. Concise Inorganic Chemistry by J.D Lee, Oxford University Press; Fifth Edition, 2008.
5. Principles of Inorganic Chemistry by B.R. Puri, L.R. Sharma, and K.C. Kalia, Vishal Publishing, Fifty Fifth Edition, 2020.
6. Stereochemistry: Conformation and Mechanism by P.S. Kalsi, New Age International, Eighth Edition, 2015.
7. Organic Chemistry Concepts and Applications by Jagdamba Singh, Pragati Prakashan, Eighth Edition, 2015.
8. Organic Chemistry by R.T. Morrison and R.N. Boyd, Pearson Education, Seventh Edition, 2010.
9. Organic Chemistry: Structure and Function by P. Volhardt and N. Schore, WH Freeman; Eighth Edition, 2018.

Course Outcomes:

- CO1: To demonstrate and realise the trend in various periodic properties associated with different elements present in different groups and periods of modern periodic table.
- CO2: To acquire the knowledge of free energy concept for the thermodynamics associated with chemical reactions and equilibria.
- CO3: To analyze and implement the concepts of spectroscopic techniques for identification of various organic and inorganic compounds.
- CO4: To evaluate and visualize the concept of configurations and conformations of various organic compounds
- CO5: To assess the generation, reaction and identification of intermediates involved during organic reactions and their applications in different organic reaction mechanisms.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	1	2	2	2	3
CO2	3	2	2	2	0	0
CO3	3	1	2	2	2	2
CO4	3	1	2	2	1	1
CO5	3	2	2	2	2	1

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) -: No Correlation

23ES1001 BASIC ELECTRICAL ENGINEERING (2-0-0)

MODULE I: (6 Hrs)

D.C Networks: Kirchoff's laws, node voltage and mesh current methods, delta-star and star-delta conversions, superposition principle, Thevenin's and Norton's theorems, Maximum Power Transfer Theorem.

MODULE II (6 Hrs)

Single phase and three phase ac circuit: Average and effective values of sinusoids, solution of R, L, C series circuits, solution of series and parallel circuits, series -parallel resonance. Line and phase quantities, Delta and star connections, solution of the balanced three phase circuits, measurement of power in three phase circuits.

MODULE III (6 Hrs)

Magnet circuit & principle of electromechanical energy conversion: Review of fundamental laws of electromagnetic induction, Solution of simple magnetic circuits. DC machine: Construction, types, emf equation of generator, torque equation of motor, speed control of DC motors

MODULE IV (6 Hrs)

AC MACHINES: Single Phase Transformer: Construction, emf equation, no load and load operation, voltage regulation and efficiency. Three Phase Induction Motor: Construction, principle of working, concept of slip, torque speed relation. Principle of operation of Three Phase alternator.

MODULE-V (6 Hrs)

Introduction to Power System: General structure of electrical power systems, Concepts of Generation, Transmission and Distribution, Sources of Electrical Power

ESSENTIAL READING

1. G. Rizzoni, Principles and Applications of Electrical Engineering, TMH , 2017
2. Nagrath I.J. and D. P. Kothari, Basic Electrical Engineering, Tata McGraw Hill.

SUPPLEMENTARY READING

1. S. Parker Smith, "Problems in Electrical Engineering", Asia Publications, 10th Edition.
2. Edward Hughes (revised by Ian McKenzie Smith), "Electrical & Electronics Technology", Pearson Education Limited. Indian Reprint 2002, 10th Edition.

Course Outcomes:

Upon completion of the subject the students will demonstrate the ability to:

- CO1 Implement principles of DC network, theorems and transients.
- CO2 Analyze the concept of Single phase and three phase AC circuits.
- CO3 Express the concept of magnetic circuit and DC machines.
- CO4 Apply basic principles of AC machines and their working.
- CO5 Demonstrate basic principles of power system

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	1	2	1	-	-	-	-	1
CO2	3	3	2	1	1	2	1	-	-	-	-	1
CO3	3	3	2	1	1	2	1	-	-	-	-	1
CO4	3	3	2	1	1	2	1	-	-	-	-	1
CO5	3	3	2	1	1	2	1	-	-	-	-	1

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) -: No Correlation

Program Articulation Matrix row for this Course

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Course 3	3	3	2	1	1	2	1	-	-	-	-	1

23ES1002 BASIC ELECTRONICS (2-0-0)

COURSE OBJECTIVE:

1. To impart the fundamentals of semiconductor devices and their applications to various circuits.
2. To impart the knowledge of fundamentals of digital electronics and Integrated Circuits (IC).
3. To impart the knowledge of electronic measuring instruments and fundamentals of communication systems.

MODULE I (7 Hrs)

Semiconductor Physics: Properties of semiconductor, current flow in semiconductors, voltage-current characteristic of a p-n junctions, Rectifiers Bipolar junction Transistor (BJT): Device structure, types and modes of operation, static characteristic, BJT as a switch, BJT as an amplifier, concept of biasing of BJT

MODULE II (7 Hrs)

JFET: Physical structure, operation and static characteristics

MOSFET: Physical structure, operation and characteristics of D- and E type MOSFET
 Integrated Circuits: Introduction to CMOS technology in VLSI, Introduction to Integrated circuits, Fabrication of monolithic IC, Integration of circuit components, Limitations of VLSI

MODULE III (6 Hrs)

Feedback Amplifiers: General feedback structure, properties of negative feedback, four basic types of feedback topologies (Block diagram only) Operational Amplifier (OP-AMP): Ideal OP-AMP, inverting configuration, non-inverting configuration, OP-AMP Applications (Adder, Subtractor only)

MODULE IV (5 Hrs)

Digital Electronics fundamentals-Number system (Decimal, Binary, Octal and Hexadecimal), conversion among number systems, signed-binary numbers, binary addition, subtraction, multiplication and division, logic gates, laws of Boolean Algebra, simplification of expressions

MODULE V (5 Hrs)

Electronic Instruments: Overview of CRO, DSO; principles of operation, waveform reconstruction, Comparison between CRO & DSO, applications of oscilloscope

Principles of Communication Systems: Fundamentals of AM & FM, (Waveforms and general expressions only)

ESSENTIAL READING

1. Electronics Fundamentals and Applications, D. Chattopadhyay and P.C. Rakshit, New Age International Publications. (Selected portions from chapters)
2. Electronic Devices & Circuit Theory, R.L. Boylestad and L.Nashelsky, Pearson Education.

SUPPLEMENTARY READING

1. Integrated Electronics, Millman and Halkias, TMH Publications.
2. Microelectronics Circuits, A.S Sedra, K.C. Smith, Oxford University Press.
3. VLSI Design, Debaprasad Das, Oxford University Press.
4. Electrical & Electronics Measurement and Instrumentation, A.K. Sawhney, Dhanpat Rai & Co(Pvt.) Ltd

COURSE OUTCOME: After completion of the course, students should be able to

1. Understand the operation and application of semiconductor devices.
2. Analyze characteristics of FETs.
3. Apply the Feedback Amplifiers and Operational Amplifiers.
4. Remember the fundamentals of different Digital arithmetic operations

23ES1003 PROGRAMMING IN C AND DATA STRUCTURE (3-0-0)

Pre-requisites Fundamentals of Computers

Course Objectives:

1. Learn fundamentals of C programming
2. Learn various steps of program development and implementation
3. Learn different Data Structures for structured programming approach
4. Learn relation of memory and memory referencing with the program execution
5. Learn to implant small projects

Module I (10 Hrs)

Fundamentals of C

Problem-solving processes: Algorithms and Flow Chart. C as a Middle-level language, Structure of C program, Character set Identifiers, Keywords, Data Types, Constant and Variables, Statements, Input and Output statements, Operators and Expressions, Precedence of operators, Control Structures (If, Ifelse, Switch-case, For loop, While, do-While)

Module II (9 Hrs)

Function, Array, Structure and Union Functions (Built-in, user-defined), Recursive function. Array: 1 - D, 2 - D, Matrix operations, String, Passing Array to Function, Structure, Union.

Module III (8 Hrs)

Pointer & Dynamic Memory Allocation

Pointer Arithmetic, Parameter passing using pointers, Call by value vs. Call by reference, Passing parameters, pointer to pointer, pointer to function, Pointer to Structure, Array and pointers, Static vs. Dynamic memory, Pointer variables, Dynamic memory allocation functions [malloc (), calloc (), realloc (), free ()]

Module IV (7 Hrs)

Data Structures

Introduction to Data Structure, Linear Linked List: Creation, Insertion, Deletion. Stack, Stack applications (Infix to postfix, postfix evaluation), Queue (linear & circular)

Module V (6 Hrs)

Tree, Introduction to Sorting & Searching Binary Tree, Binary Search Tree, Sorting (Bubble Sort, Quick Sort), Searching (Linear Search, Binary Search)

Essential Readings:

1. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill
2. Programming in C, Pradip Dey, Manas Ghosh, Oxford Publication
3. Data Structures - (Schaum's Outlines), McGraw-Hill Education

Supplementary Readings:

1. Let us C- Yashwant Kanetkar, BPB Publications.
2. Programming with ANSI and Turbo C- Kamthane, A. N. Pearson Education
3. R. S. Salaria, Programming for Problem Solving, Khanna Publishing House
4. The C Programming Language – Brian W. Kernighan and Dennis M. Ritchie, Prentice Hall.
5. Data Structures Using C - Amiya Kumar Rath, Alok Kumar Jagadev, Scitech Publications.

Course Outcomes:

The students will learn and able to

1. Remember, understand and implement simple algorithms to C programs.
2. Test and execute programs using function, array, structure and union.
3. Analyze the relation of memory and memory referencing with the program execution.
4. Apply different Data Structures for problem solving.
5. Implement different sorting and searching algorithms.

23ES1004 ENGINEERING MECHANICS (3-0-0)

Module I (10 Hrs)

Concurrent forces on a plane: Composition, resolution and equilibrium of concurrent coplanar forces, method of moment. General case of forces on a plane: Composition and equilibrium of forces in a plane, plane trusses, method of joints and method of sections.

Module II (6 Hrs)

Friction: Fundamentals and Problems involving friction, Ladder, Wedges. Principle of virtual work.

Module III (8 Hrs)

Parallel forces on a plane: General case of parallel forces, center of parallel forces and center of gravity, Centroid of plane and composite figures, Theorems of Pappus and Guildins. Moment of inertia: Plane figure with respect to an axis in its plane and perpendicular to the plane, Polar moment of inertia, parallel axis theorem.

Module IV (8 Hrs)

Rectilinear translation: Kinematics, Principle of dynamics, D'Alembert's Principle, Principle of work and energy for a particle and a rigid body, Conservation of energy, Principle of impulse and momentum for a particle and a rigid body, Conservation of momentum, System of rigid bodies, Impact, direct and central impact, coefficient of restitution.

Module V (8 Hrs)

Curvilinear translation: Kinematics, Equation of motion, Projectile, D'Alembert's principle of curvilinear motion. Kinematics of rotation of rigid body.

Essential Reading:

1. Engineering Mechanics: S. Timoshenko, D.H. Young, J.V. Rao, Sukumar Pati, 5th Edition, 2017 McGraw Hill.

Supplementary Reading:

1. Engineering Mechanics, Static and Dynamics, J. L. Meriam and L.G. Kraige, 9th Edition, 2021, John Wiley & Sons, Inc.
2. Fundamental of Engineering mechanics, S Rajasekharan & G Shankara Subramaniam, 3rd Edition, 2017, S. Chand .
3. Engineering mechanics: K. L. Kumar and Veenu Kumar, 4th Edition, 2017, Tata MC Graw Hill.

Upon completion of the subject the students will be able to:

- CO1 Ability to analyze objects in static equilibrium including the determination of reactions, forces and moments.
- CO2 Enrich fundamental concept of friction and demonstrate the analytical skills to solve the problems involving friction.
- CO3 Assimilate the knowledge for determination of centroid and second moment of area of sections and their engineering applications.
- CO4 To analyze the work done by forces, the energy transferred from one object to other and apply principle of work and energy conservation for realistic (/Practical) engineering problems.
- CO5 Identify the various parameters in projectile motion. Apply the principle of dynamics to analyze the curvilinear motion of rigid bodies.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	2	-	-	-	3	1	-	1
CO2	3	3	2	1	2	-	-	-	3	1	-	1
CO3	3	3	2	1	2	-	-	-	3	1	-	1
CO4	3	3	2	1	2	-	-	-	3	1	-	1
CO5	3	3	2	1	2	-	-	-	3	1	-	1

Program Articulation Matrix Row for this Course

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO	3	3	2	1	2	-	-	-	3	1	-	1

23ES1005 BASIC CIVIL ENGINEERING (2-0-0)

Module I (6 Hrs)

Introduction to Civil Engineering: Various disciplines of Civil engineering, Importance of Civil engineering in infrastructure development of the country, interdisciplinary nature of construction projects. Residential Buildings: NBC Classification, Basic Components of a building: Basic requirement. Planning and Design of buildings: fundamental requirements, selection of sites, Introduction to building design: functional and structural design. Foundations: Classification, Bearing Capacity of Soil and related terms (definition only)

Module II (6 Hrs)

Fundamental Properties of Construction Materials: Physical, mechanical and durability properties. Construction materials: stone, bricks, cement, aggregate, mortar, concrete, timber, steel, non-ferrous metals, paint, plastic, glass, adhesive, tiles, composites(Definition, classification and application)

Module III (6 Hrs)

Importance of Transportation, Transportation modes i.e. Highway, railway, airways, water, pipe and conveyor – Basic Characteristics, advantages and disadvantages. Indian road transport system: Types of roads, classification of highway, urban roads: basic requirements and classification. Basic Components of a Road, Rigid and Flexible pavement (comparison only)

Module IV (6 Hrs)

Quantity of water: Sources of water, Per capita demand, drinking water standards, Public Water Supply System: Necessity and Basic lay out. Conventional water treatment process: Screening, Plain Sedimentation, Sedimentation aided with Coagulation, Filtration, and Disinfection (working principles only).

Module V (6 Hrs)

Irrigation: Importance of Irrigation, Classification of Irrigation projects, Irrigation system: Types, Field water distribution, Multipurpose river valley projects, Dams: Purpose, types. Layout of canal Irrigation system: components and definitions.

Essential Reading:

1. Basic Civil engineering, Gopi, S., Pearson Publication
2. Basic Civil Engineering, Bhavikatti, S. S., New Age.

Course Outcomes:

1. Able to understand the basics of civil engineering and fundamental aspects of building.
2. Able to get the brief overview of general aspect of building material.
3. Able to get brief idea about transportation modes and planning.
4. Able to get brief idea about drinking water standards and water treatment plant.
5. Able to get brief idea about irrigation network system.

23ES1006 BASIC MECHANICAL ENGINEERING (2-0-0)

MODULE-I (11 Hrs)

Thermodynamics: Systems, Properties, Process, State, Cycle, Internal energy, Enthalpy, Zeroth Law, First law and Second Law of Thermodynamics, Basic Concept Entropy, Properties of ideal gas, Properties of pure substances, Enthalpy, Specific volume, Internal energy and dryness fraction of steam, use of Steam tables. Related numerical.

MODULE-2 (8 Hrs)

Application of Thermodynamics: Single stage air compressor, Steam Power Plant, I.C. Engines (Brief Description on working principles with Schematic diagrams only)
Elements of Fluid Mechanics and Heat Transfer Properties used in Fluid Mechanics, Fluid Statics, Kinematics and Dynamics (Concepts only), Heat transfer and Classifications (Concepts only)

MODULE-3 (7 Hrs)

Introduction to Manufacturing: Classification of engineering materials, Material Properties, Manufacturing processes: Welding, Casting, Forming (Basics only)

MODULE-4 (4 Hrs)

Basic Power transmission devices: Belt, Gear drives, clutch, brakes. (Working principle only)

Introduction to Robotics: Robot anatomy, Joints and links and common robot configurations.

Essential Reading

1. Basic Mechanical Engineering by Pravin Kumar, Pearson
2. Basic Mechanical Engineering by A R Israni, P K Shah, BS Publications
3. Text book of Elements of Mechanical Engineering, S T Murthy, Universities press
3. Basic and applied Thermodynamics by P. K. Nag, Tata McGraw Hill

Supplementary Reading

1. Basic Mechanical Engineering by D. Mishra, P. K Parida, S.S.Sahoo, India Tech Publishing company
2. Elements of Mechanical Engineering by J K Kittur and G D Gokak, Willey
3. Basic Mechanical Engineering by Basant Agrawal, C M Agrawal, Willey
4. Engineering Thermodynamics by P. Chattopadhyaya, Oxford University Press

COURSE OUTCOMES

- CO1: Comprehending the Law of Thermodynamics
CO2: Being aware of how crucial thermodynamics is to IC engines, power plants, refrigerators, and Heat Pump
CO3: Being aware of fluid mechanics and heat transfer concepts
CO4: Recognizing the functions of Engineering materials
CO5: Have a fundamental understanding of welding, Casting, Forming and other manufacturing techniques.
CO6: Recognizing fundamental power transfer mechanisms and aware of the fundamental robotics system.

23HS1001 UNIVERSAL HUMAN VALUES (2-0-0)

UNDERSTANDING HARMONY AND ETHICAL HUMAN CONDUCT

Module 1- Foundations of Value Education

Right Understanding, Relationship and Physical Facility (Holistic Development and the Role of Education), Understanding Value Education, Self-exploration as the Process for Value Education, Continuous Happiness and Prosperity - the Basic Human Aspirations, Happiness and Prosperity-Current Scenario, Method to Fulfil the Basic Human Aspirations.

Module 2-Harmony in the Human Life, Relationships and Society

Understanding Human being as the Co-existence of the Self and the Body, Distinguishing between the Needs of the Self and the Body, Achieving Harmony: Integrating Self and the Body, Harmony in the Family and Society, 'Trust' & 'Respect' -as Foundational Values in Relationship, Other Feelings, Justice in Human-to-Human Relationship, Understanding Harmony in the Society & Universal Human Order.

Module 3-Harmony in the Nature/Existence & Professional Ethics

Understanding Harmony in the Nature, Interconnectedness, self-regulation and Mutual Fulfilment among the Four Orders of Nature, Realizing Existence as Co-existence at All Levels, The Holistic Perception of Harmony in Existence, Natural Acceptance of Human Values, Humanistic Education, Humanistic Constitution and Universal Human Order, Competence in Professional Ethics - Ethical Decision Making&Transition towards Value-based Life and Profession.

23HS1002 ENGLISH FOR TECHNICAL WRITING (2-0-0)

Course Objective:

1. To develop awareness about the complexity of the communication process.
2. To provide learning environment to practice listening, speaking, reading and writingskills.
3. To assist the students to carry on the tasks and activities through guided instructions and materials.
4. To develop effective writing skills so as enable students to write in a clear, concise, persuasive manner
5. To acquaint students with a variety of forms of writing in professional world.
6. To effectively integrate English language learning with employability skills and training.

Module - I (6 Hrs)

Fundamentals of Technical Communication

1. Process of communication, types of communication (Verbal & Non Verbal)
2. Channels of business communication
3. Barriers to communication.
4. Bias free language
5. Cross-cultural communication

Module - II (6 Hrs)

Communicative Grammar Hours

1. Time and Tense
2. Passive and active voice
3. English Conditionals

Module - III (6 Hrs)

Sounds of English Hours- 06

1. Consonant sounds of English
2. Vowel sounds of English
3. Stress pattern: Syllable, Stress and Intonation.
4. Problem sounds for Indian speakers

Module - IV (6 Hrs)

Professional Communication for Workplace

Paragraph writing (The Seven Cs of Good Professional Writing)

Formal Letter Writing

Memo and Notice writing

Agenda and Minute writing

Report Writing

Module - V (6 Hrs)

Professional Communication for Employment

1. CV writing
2. Interview skills

Essential Reading:

1. Effective Technical Communication by M Ashraf Rizvi (Tata McGraw Hill)
2. Better English Pronunciations By J. D.O Conner (Cambridge University Press)

Course Outcome:

At the end of this course students will demonstrate the ability to

- CO1: Understand the concept and nature of communication and the objective of Technical Communication relevant for the work place as Engineers.
- CO2: Use suitable vocabulary and grammar with confidence and express their ideas both in speech and writing.
- CO3: Evaluate their efficacy as fluent and efficient communicators by learning the voice-dynamics.
- CO4: Write flawless business correspondence like formal letters, memos, notices, reports

23BS1201 PHYSICS LABORATORY (0-0-3)

List of Experiments:

1. Determination of acceleration due to gravity by using Bar pendulum
2. Determination of wave length of monochromatic light with the help of Newton's ring apparatus.
3. Determination of grating element of a diffraction grating using spectrometer
4. Study of resonance using sonometer for unknown frequency
5. Study of RLC Circuit
6. Determination of surface tension of water by capillary rise method
7. To draw the characteristics of a bipolar junction transistor
8. To determine the rigidity modulus of the material of a wire by using Barton's apparatus.
9. To determine e/m ratio
10. Magnetic field measurement from Helmholtz coil

Course Outcomes: Upon completion of the subject the students will demonstrate the ability to:

- CO1 Express the idea of calculation of acceleration due to gravity at any place using the concept of oscillatory system and simple harmonic motion.
- CO2 Demonstrate the working and operational technique to calculate the mechanical properties of fluid and other materials.
- CO3 Evaluate the voltage, current, power and characteristics behaviour of the electronic devices.
- CO4 Understanding the rigidity concept of solid materials.
- CO5 Analyzing the electrical and magnetic field measurements and their applications.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	3	2	1	1	3	3	1	1
CO2	3	3	2	1	3	2	1	1	3	3	1	1
CO3	3	3	2	1	3	2	1	1	3	3	1	1
CO4	3	3	2	1	3	2	1	1	3	3	1	1
CO5	3	3	2	1	3	2	1	1	3	3	1	1

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) -: No Correlation

23BS1202 CHEMISTRY LABORATORY (0-0-2)

Chemistry Laboratory (Any Ten Experiments):

1. Determination of the alkalinity in the given water sample.
2. Determination of the temporary and permanent hardness in the given water sample by complexometric titration using EDTA as standard solution.
3. Determination of amount of available chlorine in bleaching powder.
4. Standardization of potassium permanganate using sodium oxalate
5. Determination of amount of ferrous iron present in Mohr's salt.
6. Determination of the rate constant of a chemical reaction.
7. Estimation of calcium in Limestone

8. Determination of dissolved oxygen in water sample.
9. Determination of the partition coefficient of a chemical between two immiscible liquids.
10. Determination of the strength of given HCl solution by titrating it against NaOH solution using pH meter.
11. Conduct metric titration of strong acid and strong base.
12. Determination of viscosity of lubricating oil by Redwood viscometer.
13. Determination of flash point of a given oil by Pensky-Martens flash point apparatus.
14. To find out the concentration of a given potassium permanganate solution spectrophotometric method.
15. Synthesis of Aspirin/Paracetamol.

Essential Reading:

1. Practical Chemistry by D.N. Bajpai, O.P. Pandey and S. Giri, S. Chand Publishing, Revised Edition, 2010.
2. Practical Physical Chemistry by B. Vishwanathan and P.S. Raghavan, Viva Books, First Edition, 2012.

Course Outcomes:

- CO1: To analyze the alkalinity and hardness value of the water sample.
 CO2: To analyze the concentration of copper present in the solution.
 CO3: To analyze kinetics of the reactions.
 CO4: To gain hands-on experiences of pH meter, conductometer, and spectrophotometer.
 CO5: To analyze viscosity and flash point of lubricating oils.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	3	2	2	2
CO2	3	2	3	2	2	2
CO3	3	2	3	2	2	2
CO4	3	2	3	2	2	2
CO5	3	2	3	2	2	2

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) -: No Correlation

Program Articulation Matrix Row for this Course

	PO1	PO2	PO3	PO4	PO5	PO6
Course 3	3	2	3	2	2	2

23ES1201 BASIC ELECTRICAL ENGINEERING LABORATORY (0-0-3)

List of Experiments

1. Preliminary: Preparation of symbol chart for various systems & components as per ISS, to study the constructional & operational features for Voltmeter, Ammeter, Wattmeter, Frequency meter, multi-meter and Rheostat, Study of safety rules.
2. Demonstration of cut-out sections of machines: dc machine (commutator-brush arrangement), induction machine (squirrel cage rotor), synchronous machine (field winding - slip ring arrangement) and singlephase induction machine.
3. Measurement of the armature & field resistance of D.C. Machine by volt-amp method.
4. Starting and speed control of a D.C. shunt motor

5. Study of BH Curve of ferromagnetic core.
6. Determination of open circuit characteristics (O.C.C) of D.C shunt generator when separately excited at different speeds and different excitation levels.
7. Calibration of a single-phase Energy Meter by direct loading.
8. Measurement of power & power factor of a single-phase circuit
9. Measurement of earth resistance and insulation resistance.
10. Verification of Thevenin and Norton's theorem

Course Outcomes

Upon completion of the subject the students will demonstrate the ability to:

- CO1 Express the safety rules as per ISS and symbols of different electrical components and the use of various electrical instruments in the laboratory.
- CO2 Demonstrate the working and operational characteristics of dc motor and dc generator.
- CO3 Evaluate the voltage, current, power and power factor of choke coil and study BH curve of a ferromagnetic core.
- CO4 Measure armature and field resistance of DC machines, earth resistance and insulation resistance and demonstrate the internal structure of different machines.
- CO5 Analyze the connection and calibration of single phase energy meter

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	3	2	1	1	3	3	1	1
CO2	3	3	2	1	3	2	1	1	3	3	1	1
CO3	3	3	2	1	3	2	1	1	3	3	1	1
CO4	3	3	2	1	3	2	1	1	3	3	1	1
CO5	3	3	2	1	3	2	1	1	3	3	1	1

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) -: No Correlation

Program Articulation Matrix row for this Course

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Course	3	3	2	1	3	2	1	1	3	3	1	1

23ES1202 BASIC ELECTRONICS LAB. (0-0-3)

SESSIONAL OBJECTIVE:

1. To provide engineering skills for circuit design on breadboard with electronic components.
2. To impart the knowledge on digital fundamentals and digital circuit design.
3. To analyze various electronic circuits such as BJT, FET, OP-AMPS etc.

Experiment No.

1. Familiarity with electronic components and devices (Testing of semiconductor diode, Transistor, IC Pins connection) Digital Multimeter should be used.
2. Study and use of CRO to view waveforms and measure its Amplitude and Frequency.
3. V-I Characteristics of a Semiconductor Diode
4. V-I (Output) Characteristics of N-P-N/P-N-P Transistor in CE Configuration
5. Measurement of pinch off voltage and plot transfer characteristics and drain characteristics of JFET.

6. Transfer characteristics and drain characteristics of MOSFET.
7. OP-AMP: Inverting and Non-Inverting Configuration. Record of Waveforms.
8. Verification of Truth table of Logic gates (AND, OR, NOT, NAND, NOR, EX-OR)
9. Half Wave and Full Wave Rectifier without Capacitor filter. Record of Waveforms, Measurement of Average and RMS value.
10. Implementation of digital circuit using Universal gates.

SUPPLEMENTARY BOOKS

1. Integrated Electronics, Millman and Halkias, TMH Publications.
2. Electronic Devices & Circuit Theory, R.L Boylestad and L. Nashelsky, Pearson Education.

SESSIONAL OUTCOME

After completion of the sessional student should be able to

1. Acquire basic knowledge on electronic devices and components
2. Design different electronics circuits using semiconductor diodes.
3. Analyze and develop the characteristics of BJT and FET Circuits
4. Implement Operational amplifier circuits.
5. Acquire knowledge on basic digital logic gates.

23ES1203 PROGRAMMING LAB. (0-0-3)

Experiment Details

Sl.No	Expt	Experiment Details
	No.	
1	1	Write a program to print your Bio-data.
	2	Write a program in C to test the arithmetic operators.
	3	Write a program to find out the simple interest and compound interest with the given input data.
2	1	Write a program to test the logical, bitwise, unary and ternary operators with the given input data.
	2	Write a program to check an inputted year is leap year or not.
	3	Write a program to calculate the salary of an employee given his basic pay, DA, HRA and TA. Display the output in format of salary statement.
3	1	Write a program to enter the marks of a student in 4 subjects. Then calculate the total, Aggregate %, and display the grades obtained by the student.
	2	Write a program to enter a number from 1-7 and display the corresponding day of the week using switch case statement.
	3	Write a program using switch case that read 4 nos. and display a menu that offers 4 options: calculate total, calculate average, display the smallest, and the largest number.
4	1	Write a program to check a given number is palindrome or not.
	2	Write a program to generate prime numbers present between two given numbers.
	3	Write a program to print the following pyramid star pattern.

```

*
***
*****
*****

```

- 5 1 Write a program that will accept an array, and find the largest number, smallest number, sum of the elements and average of the elements present in the array.
- 2 Write program that will accept an array and sort the array in ascending order. Display both the unsorted and sorted arrays.
- 3 Write a program that will insert an element at a desired position of an array. Show the array before insertion and after insertion of the new element (Array, element and position will be provided by the user)
- 6 1 Write a program to swap the value of two inputted variables using function. Show the initial value and value after swapping.
- 2 Write a program to print the Fibonacci series using function.
- 3 Write a program that will accept two matrices using function and multiply them using function and show the result using function.
- 7 1 Write a program to find the GCD among two given numbers using recursion.
- 2 Write a program to accept student data in a structure and display the structure elements.
- 3 Check if an inputted string is a palindrome or not using pointer.
- 8 1 Write a program to read and print an array of n numbers, then find out the smallest number and its position in the array. Perform all these operations using pointer and function.
- 2 Write a program to implement `realloc()` and `free()`.
- 3 Declare a pointer; allocate a block of memory to it using Dynamic Memory Allocation. Input a set of integers to the allocated memory block. Display the set of numbers.
- 9 1 Write a program to implement insertion and deletion of an element using linked list.
- 2 Write a program to implement Push and Pop operations in Stack.
- 3 Write a program to implement insert and delete operations in Queue.
- 10 1 Write a program to implement Quick Sort algorithm using C.
- 2 Write a program to search an element using Linear Search algorithm.
- 3 Write a program to search an element using Binary Search algorithm.

23ES1204 COMMUNICATIVE ENGLISH & REPORT WRITING LAB.

Course Objective:

The purpose of the English lab is to involve students to actively participate in language learning exercises and get more practice than the traditional classroom environment. The primary role of the lab is to create an environment where students feel comfortable speaking the language they are learning, and where they can get the help they need in their journey to learn English as a second language. The lab further focuses

1. To provide a platform to the students to develop their language skills.
2. To strengthen their professional skills and to improve fluency in spoken English, to practice correct pronunciation and neutralize their mother tongue influence.
3. To provide hands-on training in Speaking, Listening, reading and writing skills.
4. To improve the fluency of students in spoken English and neutralize their mother tongue influence.

Assignment I Self- introduction
Assignment II Professional presentation

Assignment III	Power point presentation
Assignment IV	Situational conversational practice/ Role play
Assignment V	Review of a book/newspaper editorial/ movie
Assignment VI	Cover letter and CV writing
Assignment VII	Listening Practice
Assignment VIII	Group Discussion
Assignment IX	Mock Interview
Assignment X	Reading Practice

Course Outcome:

At the end of this course students will demonstrate the ability to

- CO1: To acquire strategic competence to use both spoken and written language in a wide communication strategies. range of
- CO2: To maintain good linguistic competence- through accuracy in grammar, pronunciation and vocabulary.
- CO3: Speak English with proper pronunciation and intonation
- CO4: Make effective oral presentations by interpreting and analysing data, pictures and videos and participate in Group Discussion on general topics

23ES1205 ENGINEERING GRAPHICS AND DESIGN LAB. (0-0-3)
(with AutoCAD)

1. Introduction to AutoCAD: Basic commands, Code provision of IS-696 regarding Lines, Lettering and Dimensioning.
2. Drawing of Scales (Plane Scales, Diagonal Scales, Vernier Scales and Scales of Chords).
3. Construction of simple geometrical figures and Engineering curves.
4. Orthographic Projections:
 - i) Projection of a point situated in various quadrants.
 - ii) Projections of straight lines.
 - iii) Projection of plane figures.
 - iv) Projection of simple solids.
 - v) Section of solid and Development of surfaces.
5. Isometric projection and perspective view.

Essential Reading:

1. N. D. Bhatt, Geometrical Drawing, Charotar Book Stall, 2002.

Supplementary Reading:

1. K. Venugopal, Engineering Drawing and Graphics + AutoCAD, New Age International (P) Limited. 4th Reprint: June, 2008.
2. K. L. Narayana and P. Kannaiah, Engineering Graphics, Tata McGraw Hill Publishing Co. Ltd.
3. J. D. Bethune, Engineering Graphics with AutoCAD, Pearson Education.

23ES1206 Workshop and Digital Manufacturing Laboratory (0-0-3)

1. Preparation of job in fitting section/Study of lathe and turning operation
2. Preparation of job in black smith section/ Study of milling machine and milling operation.

3. Preparation of job in carpentry section/ milling operation on CNC milling machine.
4. Study of CNC lathe machine and turning on CNC lathe.
5. Study of Robot (Pick and place and palletizing operation).
6. Study of additive manufacturing using 3D printer and product development.

1. Carpentry Section: Study of different Hand tools, measuring instruments and equipments used in Carpentry work. Safety precautions.

Preparation of Job: Carpentry job involving different types of joint.

Includes the operations: Measuring, Marking, Sawing, Planing, Chiseling, Mortising, Tenoning, making Half-lap joint, Mortise & Tenon joint and Nail joint.

2. Fitting Section: Study of different Hand tools, measuring instruments and equipments used in Fitting work.

Safety precautions. Study of Drilling Machine and Grinding Machine.

Preparation of Job: Paper Wt. / Square or Rectangular joint (male-female joint) (any one)
Includes the operations: Measuring, Marking, Filing, Sawing, Drilling, Tapping, Dieing and Punching.

3. Black Smith Section: Study of different Hand tools, equipments and Open hearth furnace used in Blacksmith work. Different types of heat treatment processes. Safety precautions.

Preparation of Job: Weeding hook/ Chisel (any one)

Includes the operations: Measuring, Marking, Cutting, Upsetting, Drawing down, Bending, Fullering and Quenching.

4. Turning/ Milling Section (Conventional & CNC)

A. Study of Lathe Machine, different parts of Lathe and different applications of Lathe. Study of different measuring & marking instruments.

B. Study of Milling Machine, different parts and applications of Milling Machine. Study of different measuring & marking instruments.

C. (i) Study of CNC Lathe Machine, different parts of CNC Lathe and its operation.

(ii) Part programming for turning operations.

D. (i) Study of CNC Milling Machine, different parts of CNC Milling Machine and its operation.

(ii) Part programming for milling operations.

5. Robotics Lab:

A. Study of Robot.

B. Pick and place operation, demonstration and explanation of code.

C. Palletizing operation, demonstration and explanation of code.

6. Additive Lab

Study of 3D Printer and demonstration of its operation.

Course Outcomes: At the end of the course, the student will be able to:

CO1 Acquire knowledge of conventional & CNC (Lathe and Milling Machine). CNC code and part programming for Milling and Turning operations. Different types of hand tool, measuring instruments and machine tools used in Fitting, Carpentry & Smithy work.

CO2 Know about different types of operations and joints performed in different shops i.e. in Fitting and Carpentry.

- CO3 Explore learning about forging temperature of different types of ferrous metals and different types of operation (e.g. upsetting, edging, flattening and bending etc.) carried out on hot metals to prepare jobs.
- CO4 Acquire knowledge for the preparation of different types of jobs by using conventional/CNC Lathe and Milling Machines (e.g. facing, step turning, knurling, drilling, boring, taper turning, thread cutting and different methods of indexing for machining gears).
- CO5 Acquire skills in using different precision measuring and marking instruments. Understand the importance of safety precaution in different shops.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	2	2	1	1	3	1	2	1
CO2	-	-	1	-	2	2	1	1	3	1	2	1
CO3					1	2	1	2	3	1	2	1
CO4					3	2	1	1	3	1	2	1
CO5	-	-	-	-	-	-	-	1	2	1	1	1

23BS1004 MATHEMATICS - II (3-0-0)

Course Objective

The objective of this course is to familiarize the prospective engineers with techniques in ODE, PDE and Fourier analysis. It aims to equip the students to deal with advanced level of mathematics and applications that would be essential for their disciplines.

Module-I (8 Hrs)

First order ODE :

Exact ODEs. Integrating factors. Linear first order ODEs. Nonlinear first order ODE and Bernoulli's equations, Applications to Population growth, Newton's law of cooling, RL circuit.

Module-II (8 Hrs)

Second order ODE :

Second order linear differential equations with constant coefficients, Euler-Cauchy equations, method of undetermined coefficients, solution by variation of parameters. Power series solutions of ODE. Legendre's equations (explicit solution only).

Module- III (8 Hrs)

Vector Calculus :

Vector and Scalar Functions and Fields, Derivatives, Gradient of a Scalar Field, Directional Derivative, Divergence of a Vector Field, Curl of a Vector Field, Line Integrals, Path Independence of Line Integrals, Double Integrals, Green's Theorem in the Plane (Statement and applications)

Module- IV (8 Hrs)

Complex Analysis :

Limit, Continuity, Derivative, Analytic Function, Cauchy-Riemann Equations, Laplace's Equation, Exponential Function, Trigonometric and logarithm functions.

Module- V (8 Hrs)

Complex Analysis :

Line Integral in the Complex Plane, Cauchy's Integral Theorem, Cauchy's Integral Formula, Derivatives of Analytic Functions, Laurent series, Residue theorem with simple problems.

Essential Reading:

1. Erwin Kreyszig, Advanced Engineering Mathematics, 10th Edition, John Wiley & Sons, 2006.

Supplementary Reading:

1. E.M. Stein, Fourier Analysis: An Introduction (Princeton Lectures in Analysis)
2. Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi, 2008.
3. S. L. Ross, Differential Equations, 3rd Edition, Wiley India, 1984.
4. E. A. Coddington, An Introduction to Ordinary Differential Equations, Prentice Hall India, 1995.
5. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.

Course Outcomes:

- CO1: The effective mathematical tools for the solutions of differential equations that model physical processes.
- CO2: Apply differential equation in real life engineering problems.
- CO3: Application of modeling in differential equation.
- CO4: To know about complex functions.
- CO5: To familiar with application of complex integration.

SYLLABUS

FOR

FIRST YEAR

MBA PROGRAMME

(Effective from 2024-25)

2024-25

**BIJU PATNAIK UNIVERSITY OF TECHNOLOGY, ODISHA
ROURKELA**

COURSE STRUCTURE

FIRST SEMESTER

Category	Subject Code	Subject	L-T-P	Credit	University Marks	Internal Marks
THEORY						
1.	PC MBPC1001	Management Principles & Organizational Behaviour (MPOB)	3-0-0	3	100	50
2.	PC MBPC1002	Marketing Management	3-0-0	3	100	50
3.	PC MBPC1003	Financial Accounting and Analysis	3-0-0	3	100	50
4.	EV MBEV1001	Managerial Economics	3-0-0	3	100	50
5.	QT MBQT1001	Quantitative Techniques	3-0-0	3	100	50
6.	EV MBEV1002	Business Communication	3-0-0	3	100	50
7.	EV MBEV1003	Universal Human Values, Ethics and Environment	3-0-0	3	100	50
8.	EV MBEV1004	Entrepreneurship & Legal environment	3-0-0	3	100	50
9.	EV MBEV1005	Management Lessons from Ancient India	2-0-0	2	100	50
Total			26-0-0	26	900	450
SESSIONAL / PRACTICAL						
10.	PC MBPC1201	IT Skills for Managers	0-0-2	2	-	100
11.	EV MBEV1201	Business Communication Lab	0-0-1	1	-	100
Total			26-0-3	03	-	200
Total Semester				29	900	650
Grand Total (Theory + Practical) = 1550						

SECOND SEMESTER

Category	Subject Code	Subject	L-T-P	Credit	University Marks	Internal Marks
THEORY						
1.	PC MBPC1004	Corporate Finance	3-0-0	3	100	50
2.	PC MBPC1005	Cost and Management Accounting	3-0-0	3	100	50
3.	PC MBPC1006	Human Resources Management	3-0-0	3	100	50
4.	QT MBQT1002	Business Research	3-0-0	3	100	50
5.	PC MBPC1007	Operations Management	3-0-0	3	100	50
6.	PC MBPC1008	Business Analytics	3-0-0	3	100	50
7.	PC MBPC1009	Management Information System	3-0-0	3	100	50
8.	PC MBPC1010	Strategic Management	3-0-0	3	100	50
9.	PC MBPC1011	Introduction to AI	2-0-0	2	100	50
Total			26-0-0	26	900	450
SESSIONAL / PRACTICAL						
10.	EV MBEV1202	Health & wellness	0-0-1	1	-	100
Total			26-0-1	01	-	100
Total Semester				27	900	550
Grand Total (Theory + Practical) = 1450						

MBEV1001 MANAGERIAL ECONOMICS (3-0-0)

Course Objectives:

1. To lay an adequate theoretical foundation to study various applied fields in economics and management.
2. To demonstrate the application of economic theory to business decisions.
3. To develop a student's ability to think analytically about the economic forces at work in society.
4. To develop a framework which the students may use to analyze the overall behavior of a modern mixed economy.

Module - I

Relevance of economics for business decisions, Scope of Managerial Economics, Role of Managerial Economist and Business decision making. Demand Analysis - individual demand and market demand, Determinants of demand, Elasticity of demand and its measures in business decision making, Demand Estimation and demand Forecasting, Supply Analysis.

Module - II

Production functions: Short Run Production Function - Variable Proportions, Long Run Production Function - Returns to Scale; cost minimization and output maximization, various cost concepts, cost functions, Economies of scale and economies of scope (simple numerical problems to be solved).

Module-III

Market morphology, price and output determination under different market conditions: Perfect competition, monopoly, monopolistic competition, oligopoly, Descriptive pricing approaches: Full cost pricing, product pricing; Price skimming, penetration pricing. Input pricing; Concepts of consumption, saving, and investment, Phases of business cycle, Inflation, Fiscal and Monetary policies, National Income.

Course Outcomes:

- CO-1: Adopt the managerial economics concepts for business decision making. Also know the law of demand, its exceptions and the use of different forecasting methods for predicting demand for various products and services.
- CO-2: Analyse the different costs of production and how they affect short and long run decision. Derive the equilibrium conditions for cost minimization and profit maximization. Analyse economies of scale, diseconomies of scale and economies of scope.
- CO-3: Learn about the short run and long run equilibrium of a firm and industry and also about different market structure and various pricing techniques.
- CO-4: Analyse different phases of business cycle, Analyse the impact of cyclical fluctuation on the growth of business and lay policies to control business cycle.

Reference Books:

1. Managerial Economics, Geetika, Ghosh, Raychoudhury, TMH
2. Managerial Economics, Salvatre, Srivastava, Oxford
3. Managerial Economics, Keat, Young, Banerjee, Pearson,
4. Managerial Economics, H L Ahuja, S.Chand
5. Managerial Economics Theory and Applications, DM Mithani HPH

6. Managerial Economics, PL Mehta Sultanchand&Co.
7. Managerial Economics, DN. Dwivedi,Vikash

MBEV1002 BUSINESS COMMUNICATION (3-0-0)

Course Objectives:

The objectives of the course are:

1. To provide an overview of the process and types of communication including Business Communication
2. To familiarize the learners with different formats of organizational communication
3. To infuse the correct practices and strategies of effective business writing and business presentation.
4. To put in use the basic mechanics of grammar, usage, and punctuation.
5. To create awareness of employability skills.

MODULE-1: ORAL COMMUNICATION

Communication Basics: The process of communication (2-way Model): Sender, Message, Channel, Receiver, and Feedback. Barriers to Communication, Communication Flow in Organizations: The Grape-vine; Formal Channels- Downward, Upward; Horizontal; Diagonal. Non-verbal Communication: Kinesics, Oculistics, Proxemics, Chronemics, Haptics, Paralanguage, Appearance and Artifacts.

Language Skill 1 - Listening: Listening Vs. Hearing- Importance of the listening Skill- Types of Listening: Active Listening; Empathetic Listening; Content Listening; Critical Listening- Guidelines for improving the Listening skill.

Language Skill 2- Speaking: Guidelines for improving confidence, fluency, articulation, accent and voice modulation while speaking, Cell Phone Etiquette; Meetings: Preparing a Notice- cum- Agenda; Chairperson's role; Other role functions in a meeting; Minutes of a meeting.

MODULE-II: WRITTEN COMMUNICATION

Language Skill 3 – Reading: The Process of Reading; Sub skills of Skimming, scanning, inferring, guessing word-meaning, Using appropriate speed for various kinds of reading, correction of reading faults of eye-fixation, regression, finger-pointing, sub-vocalizing, Reading aloud, and indiscriminate use of the Dictionary. Critical Reading with analytical skills.

Language Skill 4- Writing: The Writing Process- Guidelines for composing effective business messages- Persuasive Techniques: Fundamentals of Persuasion, Components of Attitude - Cognitive, Affective, Behavioural (Ethos, Pathos, Logos & Syllogism) - AIDA - NLP (VAKOG), Appeals (Emotional & Rational).

Business Letter: Form; Formats; and Types: Structure of Routine and persuasive business messages, good-will, good-news, and bad-news messages.

Business Memo; Features of an effective business E-mail; Rules of Netiquette.

Preparing a Resume- Parts of a Resume- Resume Styles: Chronological, Functional, and Chrono- Functional- Resume Design- Job Application letter.

Writing Business Reports: Features of a good business report. Formats- Printed form, Memo, Letter, manuscript; Structure of a short Formal Report. Steps in planning and preparing a business report.

Writing a Case Analysis

Applied English Grammar for Business Writing: English Verb types: Stative and Dynamic; Transitive and Intransitive; Main and Auxiliary verbs. Tenses- Subject Verb Concord- Active & Passive voice- Relative Clauses & Modifier Placement-Parallel Structures- Punctuation.

MODULE-III: EMPLOYABILITY SKILLS

Group Discussion: Difference between GD and Debate- Parameters of Performance evaluation in a GD: Awareness, Reasoning ability, Discussion Skills, Leadership, Openness, Assertiveness, Attentive Listening, Motivation and Enthusiasm- How to get prepared for GD- Some Dos and Don'ts.

Interviews: Types by purpose; 3 stages of an interview; how to prepare for an interview; how to answer FAQs; Following up with a letter of thanks.

Presentations: Their importance for a manager- Features of a good business presentation. Planning, Preparing & Structuring a PPT Preparation, Rehearsal & Delivery- Answering questions after the presentation- Overcoming stage fright- Importance of Body Language in presentations.

Communication in Global Environment:

Cross cultural communication

Technology in use - Video conferencing - Google Meet - Teams - Zoom: Arranging meetings
Social Media - Artificial Intelligence & Communication prompts.

Course Outcomes:

After the course, the students will be able to:

- CO-1: Distinguish among various levels of organizational communication and communication barriers while developing an understanding of communication as an organizational process.
- CO-2: Develop awareness of Techniques of active Listening and fluent speaking.
- CO-3: Apply the reading strategies of Skimming, Scanning, and Inferring in the comprehension of the reading texts of various types.
- CO-4: Demonstrate the ability to compose reasonably error-free business correspondence with brevity and clarity.
- CO-5: Apply Creative thinking as well as critical thinking in preparing his/her resume, in writing Reports, and in taking part in Group Discussions, and in designing PPTs for presentation.
- CO-6: Use appropriate communication skills in multicultural contexts, in social media, in web meetings, and in web browsing.

Text Books:

1. Communication Skills. Sanjaya Kumar & Pushpa lata, Oxford University Press.
2. Business Communication: Skills, Concepts, and Application- P.D Chaturvedi and Mukesh Chaturvedi, Pearson.
3. Business communication- Meenakhi Raman & Prakash Singh, OUP.

4. Business and Managerial Communication- Sailesh Sengupta, PHI learning
5. Bcom: Business Communication- A South Asian Perspective, Lehman, Dufrene & Sinha, Cengage Learning.
6. Effective Technical Communication, Ashraf Rizvi, McGraw Hill India.

MBEV1003 UNIVERSAL HUMAN VALUES, ETHICS AND ENVIRONMENT (3-0-0)

Course Objectives:

1. To develop students' understanding of the concept of Human Values and related issues.
2. To make students aware the importance of Harmony in self, family, society and nature.
3. To make the students understand the importance of ethical practices in business and governance.
4. To exhibit understanding of the importance of business environment and probable impact of environmental factors on a business.
5. To sensitize learner the link between environmental issues and business.

Module I- Universal Human Values (UHV)

Universal Human Values (UHV)- Introduction, Need for Value Education, Right Understanding, Mutual happiness and prosperity, Role of Education-Sanskar (Enabling the Transformation to Human Consciousness), Self-exploration- The Content and Process, Meaning of Happiness and Prosperity. Understanding Harmony in the Self-Harmony of the Self with the Body: Self-regulation and Health, Understanding Harmony in the Family -Feeling of Relationship as the Basis for Harmony in the Family, 'Trust' - the Foundational Value in Relationship, Respect- As the Right path to harmony in family, Affection, Care, Guidance, Reverence, Gratitude and Love as Values in Relationship. Understanding Harmony in the Society - Understanding Human Goal, Harmony from Family Order to World Family Order -Universal Human Order- From understanding self to Family order, Family cluster order, village cluster order, Nation order, and world family order. Understanding Harmony in Nature/Existence: Nature as Collection of Units: Harmony among the Four Orders- Physical order, Bio order, Animal order, and Human order. Mutual fulfilment among the Four Orders of Nature: Co-existence at all Levels. The Holistic perception of Harmony in Existence.

Case Study depicting business applications of Universal Human Values (UHV)

Module II- Business Ethics

Ethics& Business Ethics - Definition, Meaning, Importance, Nature & Scope. Factors influencing business ethics, Salient feature, Ethical principles in business. Theories of ethics- Absolutism vs. Relativism, Kohlberg stages of moral development. Managing ethical dilemmas, Ethical decision making, Employee and Business Ethics, Ethical and value-based leadership. Ethics in governance practices in corporates, Corporate scams and unethical practices. Ethical principles and practices in Marketing, Finance, HR and other disciplines. Promoting ethical culture in business organization.

Case Study depicting ethics in business to be discussed.

Module III- Environment

Natural environment; Ecology and environmental protection and sustainable development - Bio-diversity and environmental degradation issues, Managing natural disaster,

Environmental Legislations, Issues of global warming, terrorism, natural disasters. Issues relating pollution- causes, and control measures.Greening Management- Green policies and practices in corporates, Environmental Partnership, Environment Audit, Product Stewardship. Environment Management as Competitive Advantage, World Business Council for Sustainable Development (WBCSD) and its ten messages for business.

Business Environment: Meaning, nature and scope, economic and non-economic environment; internal and external environmental factors. Scanning of environment- methods and techniques of scanning (ETOP, SWOT).Economic Environment of Business: recent developments in Indian Economy. Non-Economic Environmental Factors: Non-Economic factors influencing business. Changes in Business and Industrial policy- Recent industrial policy, trade liberalization, from a Closed to Open economy. Case Study depicting Business Environment.

Course Outcomes:

- CO-1: Develop a comprehensive understanding of Universal Human Values (UHV) and their practical applications in personal, familial, societal, and business contexts.
- CO-2: Analyze ethical principles and theories in business decision-making, fostering a culture of integrity, responsibility, and leadership.
- CO-3: Evaluate environmental issues, regulations, and sustainable business practices to mitigate ecological degradation and promote corporate responsibility.
- CO-4: Assess the dynamic business environment, including economic, political, and ethical dimensions, to navigate challenges and opportunities in diverse socio-economic landscapes.

Text Book(s)

1. A Foundation Course in Human Values and Professional Ethics by R R Gaur, R Asthana, G P Bagaria,Excel Books, New Delhi, 3rd Edition.
2. A Foundation Course in Holistic Human Health by S Asthana, A Shukla, TS Perumal- UHV Publication.
3. Business Environment – B N Ghosh, Oxford
4. Business Ethics – Murthy, HPH
5. K.S.Thakur, Business,Ethics and Environment, Publisher: Aadi Publications, Seller: Neha Publisher

Reference Books

1. E.F. Schumacher, 1973, Small is Beautiful: a study of economics as if people mattered, Blond & Briggs, Britain
2. A N Tripathy, 2003, Human Values, New Age International Publishers.

MBEV1004 ENTREPRENEURSHIP & LEGAL ENVIRONMENT (3-0-0)

Course objectives:

1. The aim of learning by putting business and law together is to Create and maintain functional skill spaces on spectrum of lawful insight for Learners whether they run business entities or work for the people running it.
2. Sensitize the students to understand entrepreneurship as a career and skills required.

Module- I

Entrepreneurship: Concept of entrepreneurship and intrapreneurship, Types of Entrepreneurs, Nature and Importance, Entrepreneurial Traits and Skills, Entrepreneurship as a career, Identification of opportunity and converting idea to reality, Role of family, Society, EDIs. Sickness of Small-Scale Industries, Causes and symptoms of sickness, cures of sickness, Role of Banks and Governments in reviving industries.

Start-up Environment: Definition and characteristics of start-ups, Types of start-ups (Social, impact based, rural start-ups), Start-up India policy, Start-up Odisha policy, Knowledge of Key Accelerators, Incubators and Mentors in India, Understanding their role and advantages and disadvantages.

Module-II

Law of Contract: Contract Act: Indian Contract Act, 1872, Agreement, Contract, Essentials of Contract (Offer & Acceptance, Consideration, Capacity of Parties, Free Consent, and Legality of Object), Performance and Discharge of Contract, Remedies for breach of contract, Quasi Contract and Contingent Contract.

Special Contract: Sale and agreement to sell, Condition and Warranty, Transfer of properties, Finder of Goods, Performance of Contract of sale, Unpaid seller and his rights.

Module-III

Company Laws: Indian Companies Act 2013, Salient features and Classes of Company. Lifting of corporate veil, Procedure of Incorporation and Certificate of commencement of business, Memorandum and Articles of Association, Doctrine of ultra vires and Indoor Management, Management of Company: Qualification, Appointment of Directors, Company Meetings, Resolutions, Winding-up of Companies and their modes.

Course Outcomes:

- CO-1: Rationalise for studying Entrepreneurship Development and realizing that entrepreneurs are wealth creators in our society.
- CO-2: Demonstrate a fundamental comprehension of business opportunities and implementing them practically.
- CO-3: Discuss unique start-up or entrepreneurial ideas in groups and present a business plan that articulates and applies financial, operational, organizational, market, and sales knowledge to identify paths to value creation through 1) company formation (for-profit); 2) social innovation (non-profit); or 3) intellectual property licensing.
- CO-4: Demonstrate an in-depth understanding of the Start-up ecosystem in India and become conversant with sources of new finances, use of technology, customer acquisition concepts, etc. The focus will be on creating sustainable businesses.

Text Books:

- Entrepreneurship Development and Management, Vasant Desai, HPH
- Entrepreneurship Management, Bholanath Dutta, Excel Books
- Entrepreneurial Development, Sangeeta Sharma, PHI
- Entrepreneurship Development by Khanka
- Entrepreneurship, Rajeev Roy, Oxford University Press
- Business Law –S R Mohapatra and S R Patra, HPH
- Business Law – N D Kapoor, S Chand
- Business Law – Pathak, Tata Mc Graw Hill

MBEV1005 MANAGEMENT LESSONS FROM ANCIENT INDIA (2-0-0)

Course Objectives:

1. To understand the evolution of management thought in ancient India and its relevance in modern times.
2. To analyse the management perspective present in Vedantic literature, focusing on principles applicable to contemporary management practices.
3. To examine the ethical and moral values, leadership qualities, and strategic management lessons derived from the Ramayana, the Mahabharata and the Bhagavad Gita.
4. To explore the management and economic principles elucidated in Kautilya's Artha Sastra and the Jain texts.

Module- I

Introduction to Ancient Indian Knowledge System; Evolution of Indian management thought; Need of India oriented Approach.

Management perspective in Vedantic Literature.

Management lessons in the Ramayana: Ethical and moral values, leadership, governance, strategic alliance.

Management lessons in the Mahabharata and the Bhagavat Gita: Conflict management, Inspirational leadership, alternative perspective on work and performance

Module-II

Kautilya's management lessons: Qualities of a leader, functions and role of a leader, motivation and communication; Principles and practice of governance of a state and of a corporation; Economic Thought of Kautilya.

Management perspective in Jain Literature: Code of conduct, Four pillars of human values, Conflict resolution, Ethical management, Mahavira's Economics.

Management Lessons in Buddhist Literature: Team building, Personal development of team members, Knowledge management.

Course Outcomes:

After the course the students will be able to:

- CO-1: Demonstrate a deep understanding of the ancient Indian knowledge system, including its philosophical, spiritual, and managerial dimensions, and apply this understanding to contemporary management challenges.
- CO-2: Critically analyse the evolution of Indian management thought, recognizing key influencers and schools of thought, and synthesize these insights to develop a holistic approach to management.
- CO-3: Evaluate the management perspectives presented in Vedantic, Jain, Buddhist, and epic literature (such as the Ramayana, Mahabharata, and Bhagavad Gita), identifying common themes and principles, and apply them to address complex organizational issues.
- CO-4: Develop practical skills in leadership, governance, conflict resolution, ethical management, team building, personal development, and knowledge management, drawing from the rich tapestry of ancient Indian texts and adapting them to modern organizational contexts.

Text Books:

1. Management Practices and Thoughts in Ancient India, Khandelwal and Mohanty, Himalaya Publishing House
2. Relevance of Ramayana in Contemporary Times, Gupta, Agrawal and Sharma, IBA publications
3. Kautilya-The Artha Shastra, L.N. Rangarajan, Penguin books
4. Indian Models of Economy, Business and Management, P. Kanagasabapathi, PHI
5. Sri Bhagavad Gita for Managers, Khandelwal, Himalaya Publishing House.
6. "Indian Management and Leadership: Spiritual and Ethical Values for Corporate and Personal Success" by S. Ramaratnam: BLUEJAY BOOKS- 2007
7. "Indian Economic Development" by Uma Kapila: Academic Foundation; 2018
8. "The Mahabharata: A Modern Rendering" by Ramesh Menon Vol-1 & Vol-2, iuniverse-2006.

"The Bhagavad Gita" (translated by Eknath Easwaran), Nilagir Press, 2007

MBEV1201 BUSINESS COMMUNICATION LAB (0-0-1)**Course Objectives:**

The objectives of the course are:

1. To improve LSRW skills.
 2. To learn and practice communication skills in a business context.
 3. To enhance reading and listening comprehension.
1. Listening exercises:
 - Listening with a focus on pronunciation: segmental sounds, stress, weak forms, intonation.
 - Listening for meaning: listening to a short talk / news bulletin.
 - Taking notes from a lecture/speech.
 - Comprehending conversation
 2. Speaking exercises :
 - Giving a short speech on a topic of interest. Participate in debates.
 - Preparing for GDs, Interviews: Structured & Unstructured, Stress Interviews, Business Etiquette
 - Preparing Presentation, Making presentations before the top management.
 - Practice exercises on the common grammatical errors.
 - Role- plays to practice effective use of body language, para language and spatial communication.
 3. Reading exercises :
 - Developing vocabulary, Improving reading speed & comprehension
 - Note making after reading a text.
 - Showing the main idea and supporting ideas and the relationship between them.
 - Analyzing news articles.
 4. Writing exercises :
 - Practice in writing paragraphs, Précis writing
 - Managerial Writing: Business letters: request, invitation, proposal, sales reports
 - Managerial Writing: Ad copywriting using AIDA, appeals, cognitive dissonance, Preparing Press Releases, Press Notes

- Writing CVs and Resumes, AI Prompts & keywords
- Remedial measures to focus on correct use of English verbs, sentence structures, clause- types, Interrogation and parallel structures.

Course Outcomes:

CO-1: Create Documents

CO-2: Develop group communication skills.

CO-3: Demonstrate business etiquette.

CO-4: Demonstrate presentation skills.

CO-5: Understand and evaluate self to develop Emotional Intelligence

CO-6: Develop interviewing and responding skills.

Text Books:

1. English Language Laboratories, Nira Konar, PHI
2. Guide to Managerial Communication, Mary Munter, Pearson
3. Cengage Learning India, English Language Communication Skill – Lab Manual
4. Soft Skills for Everyone, Butterfield, Cengage
5. Campus to corporates, Sage Publication
6. A practical Course in Spoken English, Gangal, PHI

MBEV1202 HEALTH & WELLNESS (0-0-1)

Course Objectives:

1. To understand the importance of nutrition in preventing life-threatening diseases like cancer, hypertension, obesity, diabetes, and cardiovascular diseases.
2. To explore the components of physical fitness and differentiate between active and sedentary lifestyles, understanding their implications on health.
3. To examine the relevance of promoting holistic well-being in the modern world.
4. To learn various yogasanas, Pranayama, and meditation techniques for fostering a healthy mind-body connection and overall wellness.

Module-I: Introduction to Health & Wellness

Definition of health- WHO definition, definition as per Ayurveda; Importance of health in everyday life; Components of health- physical, social, mental, spiritual and its relevance; Concept of wellness: Mental Health & wellness; Mind- Body connection in health, concept and relation Implications of mind-body connections.

Module-II: Management of Health and Wellness

Stress Management and Relaxation Techniques: Understanding stress and its impact on health, Stress management strategies, Relaxation techniques, including yoga and meditation. Need and importance of yoga (Asanas and Pranayama), and meditation for healthy well-being. Preventive Healthcare and Disease Prevention: Role of preventive healthcare measures, Screening tests and immunizations, Lifestyle factors in disease prevention.

Course Outcomes:

CO-1: To understand the concept of health and wellness and its relevance in daily life.

CO-2: To be aware of the relation between mind-body and its relevance.

CO-3: To adopt healthy physical habits and behaviours for well-being.

Books:

1. A Text Book on Physical Education & Health Education Fitness, Wellness and Nutrition, Dr. A. K. Uppal, Dr. P. P. Ranganathan.
2. Dr. R. Nagarathna and Dr. H.R. Nagendra: Yoga and Health, Swami Vivekananda Yoga Prakashana, 2002
3. B. C. Rai Health Education and Hygiene, Published by Prakashana Kendra, Lucknow.

MBPC1001 MANAGEMENT PRINCIPLES & ORGANIZATIONAL BEHAVIOUR (MPOB) (3-0-0)

Course Objectives:

1. To introduce the students with the fundamentals of management and its processes.
2. To facilitate the students in understanding individual, group behavior and organizational culture and climate impacting learning organisation.

Module-I: Foundations of Management

Introduction to Management and Administration, Evolution of Management, Management Levels; Managerial Roles and Skills; Management Functions: Planning, Organising, Staffing, Directing and Controlling, Management Process, Decision Making, Contribution in the field of Management by Peter F. Drucker, Michel Porter, C.K. Prahalad, Barnand, McGregor, Rensis Likert and McKinsey.

Module-II: Organisational Behaviour- I

Introduction to Organization Behaviour, Nature, Scope, OB Model, Personality: Traits and types; Perception-Factors and Process, Employee Motivation - Values and attitude; Barriers to change attitude, Developing Emotional Intelligence at the work place, Interpersonal relation and Transactional Analysis.

Module-III: Organizational Behaviour- II

Group and Team- stages and effectiveness; Conflict Management process, Leadership- skills, roles, Styles (Managerial Grid), Women leadership in India. Organizational culture, Organizational climate VS organization culture, Factors contributing towards creating and sustaining culture, Organization Design, Change Management- Change Model and Organizational Development, Learning organisation- Organizing Knowledge Resource.

Course Outcomes:

After completing this course, students should be able to:

- CO-1: Define, remember, understand, explain and interpret various concept of Management and organizational behaviour, managerial levels, roles, and skills managerial functions. such as Planning, Organising, Staffing, Directing and Controlling.
- CO-2: Analyse and identify various aspects of individual organizational behaviour such as personality, perception, values, attitude, motivation and their impacts.
- CO-3: Evaluate group and team dynamics, including stages of development and factors influencing effectiveness, and assess leadership skills, roles, and styles, including the Managerial Grid and the role of leadership in organizational context.
- CO-4: Integrate and implement important managerial and behavioural skills to empower the students to appreciate the requirement of behavioural code of conduct in the world of business.

Text Book:

1. Management, Stephen P. Robbins, Mary Coulter, Agna Fernandez, Pearson Education, 2018
 2. Organizational Behavior, Fred Luthans, McGraw Hill, 2017
 3. Organizational Behaviour: Human Behaviour at Work, – John W. Newstrom, Tata McGraw Hill, 2017
 4. Organizational Behaviour –Text and cases by Aswathappa, 12th revised edition, Himalaya publication
 5. Essentials of Management, Harold Koontz, Heinz Weihrich, Mark V Cannice, 2020
 6. Behavior in Organizations, Jerald Greenberg & Robert A. Baron, Pearson Education, 2010
 5. Management and Organizational Behaviour, Subbarao P, Himalaya Publishing House, 2017
 6. Organizational Behaviour, Sarma, Jaico Publications, 2009
 7. Management and Organizational Behaviour, Paul Hersey and Ken Blanchard, PHI, 2009
 8. Organizational Behavior, Kavita Singh, Pearson 2010
- Mode of Evaluation: Assignments, Quiz, Mid Term Tests, End Semester Examination

MBPC1002 MARKETING MANAGEMENT (3-0-0)**Objectives:**

1. Understand the fundamental concepts and principles of marketing, including the distinction between selling and marketing, the marketing concept, and the significance of avoiding marketing myopia.
2. Analyze the marketing environment, distinguishing between macro and micro factors, and evaluate the importance of environmental analysis in strategic decision-making.
3. Develop proficiency in market segmentation, targeting, and positioning strategies, along with an appreciation for the role of consumer behavior in shaping marketing strategies.
4. Gain practical knowledge of product management, pricing strategies, distribution channels, and promotional techniques, including contemporary approaches such as digital marketing, relationship marketing, and green marketing.

Module-I

Definition & Functions of Marketing, Scope of Marketing, Marketing concept, Selling versus Marketing, Concept of Marketing Myopia. 80: 20 Principle, Introduction to the Concept of Marketing Mix, Bottom of the pyramid concept; Concept of Marketing Environment: Macro and Micro, Need for analyzing the Marketing Environment.

Module-II

Market segmentation, Bases for market segmentation, Targeting, Positioning; Meaning & importance of consumer behavior, Comparison between Organizational Buying behavior and consumer buying behavior, Buying roles, Five steps buyer decision process. Contemporary Topics: Viral Marketing, Guerrilla Marketing, Societal and social Marketing, Relationship Marketing, Green Marketing, Digital Marketing, Network Marketing (Concepts only)

Module-III

Product: Classification of consumer products and industrial products, Product Mix,

NewProduct Development Process: Idea Generation to commercialization. Product Life Cycle, Strategies across stages of the PLC.Packaging&Labeling, Basicconceptof Branding Pricing Basics: Meaning, Importance of pricing, Factors Influencing pricing decisions., Pricing strategies and approaches

Place: The Role of Marketing Channels: Channel functions & flows, channel levels. Channel conflicts and resolution (Overview only)Channel Options: Introduction to Wholesaling, Retailing, Franchising, Direct marketing, E- Commerce Marketing Practices.

Promotion: The role of marketing communications, Elements of promotion mix, IMC approach (Overview)

Course Outcomes:

CO-1: Identify the key analytical frameworks and tools used in marketing.

CO-2: Utilize the information of a firm’s external and internal marketing environment to identify and prioritise appropriate marketing strategies.

CO-3: Examine the marketing function and the role it plays in achieving organisational success both in commercial and non-commercial settings

CO-4: Analyse 4 Ps of marketing and its application across industries.

Books:

- Marketing:Baines,FillandPage,Sinha,Oxford
- MarketingManagement–Kotler,Keller,Koshy, Jha,Pearson,
- MarketingbyLambHair Sharma,McDanielCengage Learning
- MarketingManagement,Ramaswamy&Namakumari,McGrawHill
- MarketingManagement–KKarunakaran,Himalaya PublishingHouse
- MarketingManagement–TextandCases,TapanKPanda,ExcelBooks
- MarketingManagement–J.PMahajan, Vikas
- MarketingManagement-Rudani,S Chand

MBPC1003 FINANCIAL ACCOUNTING AND ANALYSIS (3-0-0)

Course Objectives:

1. To familiarize the students with accounting principles and acquaint them with accounting mechanisms, process and systems so as to develop their skills of preparing financial statements.
2. To develop their ability to read annual reports and develop their skills to interpret financial statements.
3. To familiarize the students with different financial accounting concepts affecting stakeholders.

Module-I:

Introduction to Accounting: Accounting as a language and need for Accounting, Basic Terminologies of Accounting. External and Internal users of Accounting Information, Accounting concepts and conventions, Accounting cycle, Accounting Equations, Nature of GAAP, Need for Accounting Standards, Limitations of Accounting, Ethical Issues in Accounting, Mechanics of Accounting: Introduction, Classification, Double Entry System, Preparing Journal, Subsidiary books, Ledger, preparation of Trial Balance.

Module- II:

Preparation of Financial Statements: Income statement and Balance Sheet, Corporate Accounts: Share and Share Capital, Issue of Shares, Payment in installment, Buyback of shares, Debentures and Bonds, understanding Corporate Income statement and Balance Sheet as presented in the Annual Reports of companies.

Module-III:

Financial Statement Analysis: Analysis and interpretation of Financing Statements, Common size statement, Comparative statement analysis, Trend analysis, Ratio Analysis, Cash Flow Analysis as per IND AS 7.

Course Outcomes:

- CO-1: Explain the role of accounting as a language for financial communication of businesses, and meet the needs of both external and internal users using accounting principles.
- CO-2: Illustrate the complete accounting process, including journalizing transactions, posting them to ledger, maintaining subsidiary books, preparing trial balance and drawing the financial statements for sole traders.
- CO-3: Demonstrate a comprehensive understanding of corporate accounts, including the concepts of shares, share capital, the issuance of shares, instalment payments, share buybacks, and the use of debentures and bonds in corporate financing.
- CO-4: Analyse corporate financial statements using techniques like Common Size Statement, Trend Analysis, Ratio Analysis, and Cash Flow Analysis as per IND AS 7.

Text Books:

1. Financial Accounting for Management; Paresh Shah, Oxford
2. Financial Accounting A managerial Perspective-Bapat & Raitha, McGrawHill
3. Financial Accounting for Managers-Sanjay Dhamija, Pearson
4. Accounting for Business Managers- Sakshi Vasudeva, HPH
5. Financial Accounting for Management, A.K. Bhattacharya
6. Financial Accounting for Management, Narayanswamy
7. Financial Accounting by S.N Maheswari Vikas Publications
8. Financial Accounting by Satapathy, Mohapatra, Patra, Vrinda

MBPC1004 CORPORATE FINANCE (3-0-0)**Course Objectives:**

1. To provide students with concepts, techniques and tools of Financial Management.
2. To study, analyze and improve their knowledge on financial management practices of an organization

Module I:

Foundations of Finance: Nature & Scope. Organization of Financial Functions. Emerging role of FMs in India and in Global context. Financial Goal. Agency problems. Time value of money, Compounding and discounting. Short term and long-term sources of fund.

Module II:

Investment Decisions. Capital Budgeting: Features, types and Techniques of capital budgeting decision. Cost of Capital. Financing Decision: Operating Leverage, Financial

Leverage. Capital structure. Theory and Policy. Dividend Decision Dividend Theory, Dividend Policy.

Module III:

Current Assets Management: Working Capital concepts, Policies, estimation, factors affecting working capital, Sources of financing Working Capital, Management of Cash: Cash budget, Management of collections and disbursement, Investment of Surplus cash; Management of Receivables: Terms of Credit, Credit Policy decision; Management of Inventory: Techniques of Inventory planning and control.

Course Outcomes:

- CO-1: Explain the foundational concepts including finance functions, financial goals, agency problems, time value of money, risk and return concepts, and various sources of funds.
- CO-2: Interpret the concepts of cost of capital and apply various capital budgeting techniques to evaluate investment proposals.
- CO-3: Describe the capital structure and its theories, analyse the impact of leverage on financing decisions, and apply dividend theories for effective dividend policies.
- CO-4: Identify strategies for effective current assets management including cash, receivables, and inventory to take working capital decisions.

Text Books:

- Fundamentals of Financial Management, Van Horne, Pearson
- Financial Management, G Sudarsan Reddy, HPH
- Essentials of Financial Management, IM Pandey, Vikas
- Financial Management, Khan & Jain, McGraw Hill,
- Financial Management, Srivastav & Misra, Oxford.
- Financial Management – Tulsian (S Chand)
- Fundamentals of Financial Management, Brigham, Cengage
- Financial Management by Prasanna Chandra , Tata McGraw Hill

MBPC1005 COST AND MANAGEMENT ACCOUNTING (3-0-0)

Course Objectives:

1. To understand the concept Cost accounting & Management Accounting
2. To familiarize the students about various methods of costing followed in different organizations
3. To understand and apply the various marginal costing techniques for managerial decision making

Module-I

Introduction to Cost Accounting and Management Accounting: Basic concepts: Scopes. Types of Cost, Financial Accounting, Cost Accounting and Management Accounting., Methods of Costing, Techniques of Costing, Classification of Costs, Cost Centre, Cost Unit, Profit Centre, Investment Centre, Preparation of Cost Sheet, Total Costs and Unit Costs.

Module-II

Cost Accounting System: Material Cost Management: Material Cost Valuing material issues and stock, Overheads: Meaning and Importance, production overhead, Primary distribution and Secondary distribution, allocation and apportionment of cost. Absorption by production units, Methods, over and under absorption of overhead.

Module-III

Methods and Techniques: Job Costing, Contract costing and Process Costing, Joint Product and By Products. Service Costing: Transport, Hospital, Canteen, Marginal Costing: Nature and Scope, Marginal Cost Equation, Profit Volume Ratio, Break-even Chart, Application of Marginal Costing Techniques for managerial decision making: Make or Buy decision, selection of Suitable product Mix.

Management Tools: Budgetary Control: Functional budgets, Cost budget, Master Budget, Performance budgeting and Zero based budgeting. Flexible budgets. Standard Costing: Standard cost and standard costing, standard costing and budgetary control. Analysis of variances (Material, Labour and Sales), Cost Reduction and Cost Control.

Course Outcomes:

- CO-1: Acquire, describe and explain fundamental knowledge of cost accounting concepts and identify the various elements to calculate the total cost and unit cost of a product or service.
- CO-2: Evaluate and interpret different methods costing to ascertain and control the costs in manufacturing and service industries.
- CO-3: Use costing techniques for short-term decision-making and product cost analysis.
- CO-4: Illustrate and utilize advanced management tools for budgeting, standard setting, locating variances and evaluation of performance.

Books

- A text book on Cost and Management Accounting, M.N Arora, Vikas
- Cost and Management Accounting, S P Jain, K L Narang, Simmi Agrawal, Kalyani
- Cost and Management Accounting, Colin Drury, Cengage Learning
- Morden Cost and Management Accounting, M.Hanif, Tata McGraw Hill End Pvt.Ltd

MBPC1006 HUMAN RESOURCES MANAGEMENT (3-0-0)

Course Objectives:

1. To introduce and explain different phenomenon of Human Resource Management (HRM).
2. To enrich the students' understanding on HRM, which may enable them to implement the concepts in the workplace.

Module I

Concept, Definitions and Objectives of Human Resource Management (HRM); Functions of HRM; Process of HRM; Evolution of HRM; Strategic HRM and its role in the organization; Human Resource Planning (HRP): Meaning and Process, Job analysis: Job description and Job specification; Recruitment: Meaning, Sources, Process and Yield Ratio; Selection: Meaning and Process, Tests and Interviews, Induction and Socialization.

Module II

Performance Appraisal: Meaning, Objective, Process and Methods; Potential Appraisal; Biases in performance appraisal; Methods of job evaluation; Meaning of Compensation; Types of compensation; Types of wages and theories; Wage differentials; Pay structure, Wage Law in India, Executive Compensation.

Module III

Concepts of Career, Career planning process, Career Stages; Training & Development: Concept, Training need analysis and Methods of training (on-the-job and off-the-job training), Evaluation of Training effectiveness; Concepts of Promotion, Transfer and Separation, Organization Citizenship Behaviour, HRIS, Competency mapping, Talent Management, Employee engagement.

Course Outcomes:

- CO-1: Explain & interpret different concepts, Functions & Processes of HRM.
- CO-2: Apply different tools and techniques for managing human resources in an organization.
- CO-3: Analyze, identify problems and develop skill sets in managing human resources in an organizational context.
- CO-4: Integrate the knowledge of HR concepts to Plan and design human resource intervention & strategies for an organization.

Text Books:

1. HRM Text & Cases, Aswathappa, TMH.
2. Personnel & Human Resource Management, P. Subba Rao, HPH
3. Human Resource Management – VSP Rao, Excel
4. Human Resource Management, Jyoti Venkates, Oxford
5. HR, Denisi and Sarkar, Cengage.

MBPC1007 OPERATIONS MANAGEMENT (3-0-0)

Course Objectives:

1. To understand the concepts, principles, problems, and practices of operations management.
2. To understand the importance of an effective operations strategy in an organization.
3. To understand the various production and operations design decisions and how they relate to the overall strategies of organizations.

Module I

Overview of Operations Management and Capacity Planning: Operations in Manufacturing and Services, Responsibility of Operations Manager, Operations Strategy and Competitiveness, Process Analysis, Job Design and Work Measurement; Capacity Planning – Concept, Types of capacity; Aggregate Planning - Relevant cost and strategies.

Module II

Facility Location and Layout, Inventory Management: Facility location - Factors, Techniques (single facility and multi-facility), Factor Rating Method, Centroid Method; Facility Layout – Concept, Types of layouts and Line Balancing, Inventory Management – concept, EOQ, MRP.

Module III

Scheduling, Project Management and Quality Management: Scheduling; Gantt Chart; Project Management – concept and technique PERT and CPM; Quality management – concept, quality design, control chart (X, R, P), TQM, introduction to ISO 9000 ISO 14000 (EMS), ISO 18000 (OHSAS) and ISO 22000.

Course Outcomes:

- CO-1: Identify the elements of operations management and various transformation processes to enhance productivity and competitiveness.
- CO-2: Analyse and evaluate various facility alternatives and their capacity decisions, develop a balanced line of production & AMP; scheduling and sequencing techniques in operation environments.
- CO-3: Develop aggregate capacity plans and MPS in operation environments.
- CO-4: Plan and implement suitable quality control measures in Quality Circles to TQM.

Text Books:

1. Production and Operations Management, K. Aswathappa, K. S.Bhat,HPH
2. Operations Management, Chase et.al – Tata McGrawHill.
3. Production and Operations Management , Panneerselvam ,PHI
4. Production and Operations Management , S.N Chary , Tata McGrawHill
5. Operations Management, Meenakhi Kumari,Cengage
6. Production and Operations Management, Kaniska Bedi,Oxford
7. Production & Operations Management, SP Singh, VikasPublication
8. Essentials of Operations Management by Scott T Young – SagePublication

MBPC1008 BUSINESS ANALYTICS (3-0-0)**Course Objectives:**

1. Provide foundational knowledge of business analytics concepts (descriptive, predictive, and prescriptive) and their application to business decision-making.
2. Develop skills in data management and visualization using tools like R programming and exploratory data analysis (EDA).
3. Introduce advanced predictive analytics techniques, including regression, classification, and time-series forecasting.
4. Highlight real-world business analytics applications in marketing, finance, and supply chain management.

Module-I

Introduction to Business Analytics and its importance, Types of Analytics- Descriptive, Predictive, Prescriptive, Business Analytics Framework and Applications, Data Management and Governance- Data Collection, Cleaning, Integration and Data Warehousing and ETL Processes, Data-Driven Business Models

Module-II

Introduction R Programming, Descriptive Analytics Techniques- Exploratory Data Analysis (EDA), Descriptive Statistical Techniques (e.g., mean, median, mode), Data Visualization and Reporting, Predictive Analytics Techniques- Regression Analysis, Classification Models, Time-Series Forecasting, Clustering.

Module – III

Big Data Analytics Framework and Technologies, Industry Application- Marketing Analytics, Financial Analytics, Supply Chain Analytics, Customer Segmentation, Churn Analysis, and Risk Management, Real-World Case Studies in Business Analytics

Course Outcomes:

The course aims to help students:

CO-1: Apply business analytics techniques to solve practical problems.

CO-2: Use tools like R programming to analyze and visualize data.

CO-3: Understand predictive analysis methods such as regression and classification.

CO-4: Gain skills in marketing, finance, and supply chain analytics.

CO-5: Analyze big data to improve strategic decision-making.

Text Books

1. Prasad, R.N., & Acharya, S. (2011), Fundamentals Of Business Analytics. John Wiley & Sons.
2. Kumar, U.D. (2017). Business Analytics: The Science of Data-driven Decision Making. Wiley India.
3. JuliantPallant – “SPSS Survival: A step by step guide to data analysis using IBM SPSS” – McGraw Hill Education.
4. Daniel G. Murray - "Tableau Your Data!: Fast and Easy Visual Analysis with Tableau Software" - 2ndEdition

MBPC1009 MANAGEMENT INFORMATION SYSTEM (3-0-0)

Course Objectives:

1. Introduce foundational concepts, frameworks, and types of Management Information Systems (MIS) for effective implementation and management.
2. Familiarize students with strategic and operational systems like ERP, SCM, CRM, and their role in managing business functions.
3. Provide insights into emerging technologies, such as cloud computing and IoT, and their impact on business processes.
4. Develop skills in utilizing decision support and knowledge management systems for informed decision-making.

Module I

Introduction to MIS and Data Management

Introduction to MIS, Types of MIS, CCR framework, MIS capabilities, Role of Managers in IT Implementation and Adoption, Knowledge Management – Decision Support Systems, Expert Systems, Learning Management Systems, Executive Information Systems, Database Management Systems (DBMS) Concepts, Data Warehousing and Foundations of Business Intelligence

Module II

Strategic and Operational Support Systems

Strategic Enterprise Systems - ERP, SCM, CRM, SRM. Operational Support Systems - Manufacturing Systems, Sales and Marketing Systems, HRIS, Finance and Accounting Systems, Production and Inventory Systems. IT Strategy and Balanced Scorecard – IT strategies, IT- business alignment, balanced scorecard, cloud and vendor strategies

Module III

Emerging Technologies and Ethical Issues

Mobile and E-commerce – B2C, B2B and e-procurement, C2C and mobile commerce. Emerging Technologies – Cloud computing, Big Data Technologies, Internet of Things, Bring Your Own Device (BYoD), Virtual Reality, Augmented Reality, Blockchain, Artificial Intelligence

Course Outcomes:

The course aims to help students:

- CO-1: Apply MIS concepts to analyze and solve business problems using technology-driven approaches.
- CO-2: Align IT strategies with business goals, effectively managing enterprise systems.
- CO-3: Leverage emerging technologies to identify innovation opportunities.
- CO-4: Use decision support and knowledge management systems for effective decision-making.

Text Books:

1. Louden, D. (2018). Management Information Systems: Managing the Digital Firm (15th ed.). Pearson.
2. R. De. (2018) MIS managing information system in business, government and society, publisher: willy. Second edition
3. Davis, G.B., & Olson, M.H.(2016).Management Information System. Tata McGraw-Hill.

MBPC1010 STRATEGIC MANAGEMENT (3-0-0)

Course Objectives:

1. To learn the major initiatives taken by a company's top management on behalf of corporates, involving resources and performance in business environment.
2. To specify the Organization's mission, vision and objectives and develop policies.
3. To understand the analysis and implementation of strategic management in strategic business units.

Module I

Strategy and Process: External & Internal Environment – Strategic Advantage Profile (SAP), Environmental Threat Opportunity Profile (ETOP), SWOC Analyses -Conceptual framework for strategic management, the Concept of Strategy and the Strategic Management Process – Stakeholders in business – Vision, Mission, Purpose, Objectives and Goals – Strategic intent – hierarchy of strategy – strategic business unit.

Module II

Industry Structure & Competitive Advantage:

Industry Analysis - Porter's Five Forces Model-Strategic Groups, Competitive Changes during Industry Evolution-Globalization and Industry Structure - Capabilities and competencies-core competencies-Low cost and differentiation - Generic Building Blocks of Competitive Advantage- Distinctive Competencies-Resources and Capabilities durability of competitive Advantage- Sustainable Competitive Advantage - Casestudy.

Module III

Strategy Implementation and Evaluation:

The generic strategic alternatives – Stability, Expansion, Retrenchment and Combination strategies - Business level strategy- Strategy in the Global Environment-Corporate Strategy- Vertical Integration-Diversification and Strategic Alliances - Mergers & Acquisition (Concept) - Strategic analysis and choice – Business Portfolio Analysis – BCG Matrix and GE 9 Cell Model -Mc Kinsey's 7s Framework - Balance Score Card-case study.

Designing Strategic Control Systems- Matching structure and control to strategy- Implementing Strategic Change-Politics- Power and Conflict-Techniques of strategic evaluation & control-case study, Corporate Social Responsibility.

Course Outcomes:

CO-1: Interpret the concept of corporate strategy..

CO-2: Analyse the inter-linkages between the strategy of the organization and the structure of the organization.

CO-3: Identify the different levels of corporate strategy and able to chart strategies for the organisation that derive from both the external and internal analyses performed.

CO-4: Examine the reasons for developing Strategies and analyse the resources and capabilities of the organization.

Text Books:

1. Strategic Management & Business Policy, Azar Kazmi, TMH,
2. Strategic Management, R. Srinivasana, PHI,
3. Strategic Management, Haberberg&Rieple, Oxford ,
4. An Integrated approach to Strategic Management, Hill & Jones, Cengage ,
5. Strategic Management & Entrepreneurship, D.Acharya& A. Nanda,HPH

MBPC1011 INTRODUCTION TO AI (2-0-0)

Course Objectives:

The meaning behind common AI terminology, including neural networks, machine learning, deep learning, and data science.

1. What AI realistically can--and cannot— do
2. How to spot opportunities to apply AI to problems in your own organization
3. What it feels like to build machine learning and data science projects
4. How to work with an AI team and build an AI strategy in your company
5. How to navigate ethical and societal discussions surrounding AI

Though this course is largely non-technical, engineers can also take this course to learn the business aspects of AI.

Module-I

What is AI?

Introduction, Machine Learning, What is data?The terminology of AI, What makes an AI company?, What machine learning can and cannot do, More examples of what machine learning can and cannot do, Non-technical explanation of deep learning, Non-technical explanation of deep learning.

Module-II

Building AI Projects

Introduction, Workflow of a machine learning project, Workflow of a data science project, Every job function needs to learn how to use data, How to choose an AI project (Part 1), How to choose an AI project (Part 2), Working with an AI team, Technical tools for AI teams.

Module-III

Building AI in your Company

Introduction, Case study: Smart speaker, Case study: Self-driving car, Example roles of an AI team

AI Transformation Playbook (Part 1), AI Transformation Playbook (Part 2), AI pitfalls to avoid, Taking your first step in AI, Survey of major AI application areas, Survey of major

AI techniques

AI & Society

Introduction, A realistic view of AI, Discrimination / Bias, Adversarial attacks on AI, Adverse uses of AI, AI and developing economies, AI and jobs.

Course Outcomes:

CO-1: After completing the course, the students will be able to:

CO-2: Recognize fundamental AI concepts and vocabulary, discerning prominent figures in AI enterprises.

CO-3: Apply project methodologies in machine learning and data science, demonstrating adeptness in selecting and managing AI activities.

CO-4: Analyze deployment of AI solutions, and integrating advanced collaborative technologies for team synergy.

CO-5: Evaluate ethical dimensions of AI, perceptive biases, vulnerabilities, and societal consequences, development ethical awareness.

Reference Course Link

Course Link: <https://www.coursera.org/learn/ai-for-everyone>

MBPC1201 IT SKILLS FOR MANAGERS (0-0-2)

Course Objectives:

The aim of this course is:

1. Familiarize learners with essential office software tools and their applications in various settings.
2. Provide hands-on experience with Google Services and their integration into daily tasks.
3. Equip learners with Excel skills for efficient data analysis and reporting.
4. Introduce learners to the fundamentals of Database Management Systems (DBMS) and SQL for effective data management.

Module-I: Introduction to Office Software: Types of Office Software, Working with Google Services: Docs, Spreadsheet, Presenter, Sites, etc.

Module-II: Introduction to Advanced Excel: Getting started with Excel, working with Formulas & Functions and creating Charts & Graphs, Date Functions, Look Function. Statistical tools – use statistical functions such as average, Standard Deviation, IF function etc. Data analysis by using What IF, PIVOT table, Scenarios, Goal seek.

Module-III: Introduction to Database Management Systems (DBMS): Introduction to databases and their role in business, Types of databases (Relational, NoSQL, etc.), Database Management System (DBMS) functionalities, Advantages and limitations of using a DBMS, Entity-Relationship (ER) Diagrams for data modeling, Normalization Techniques (1NF, 2NF, 3NF)

Introduction to SQL (Structured Query Language), SQL concepts and syntax, Data Definition Language (DDL) - CREATE, ALTER, DROP statements, Data Manipulation Language (DML) - SELECT, INSERT, UPDATE, DELETE statements, working with queries (filtering, sorting, grouping, joining data).

Course Outcomes:

After completing the course, the students will be able to

- CO-1: Proficiently apply the knowledge gained with essential office software tools and their diverse applications across various settings.
- CO-2: Effectively integrate Google Services into their tasks, enabling streamlined workflows and enhanced productivity.
- CO-3: Demonstrate competency in utilizing Excel for data analysis, including functions, formulas, and statistical tools.
- CO-4: Gain proficiency in the principles of DBMS, encompassing database types, normalization, and SQL syntax, for efficient data management.

Reference Books:

- Foundations of Computing, 5th Edition, Sinha and Sinha, bpb publication
- Microsoft Excel Data Analysis and Business Modeling (Office 2021 and Microsoft 365) (Seventh Edition, Wayne L. Winston, PHI)
- SQL ALL-IN-ONE, dummies for A Wiley Brand, 3rd Edition

MBQT1001 QUANTITATIVE TECHNIQUES (3-0-0)

Course Objectives:

1. To lay an adequate theoretical foundation to study various applied fields in statistics and decision science.
2. To understand role of quantitative techniques in managerial decision making.
3. To understand applications of various quantitative techniques in managerial settings.

Module-I

Statistical Methods:

Measures of central tendency and dispersion: Standard Deviation, Simple Correlation, calculation of correlation coefficient, probable error, Rank correlation. Regression: Linear regression, calculation of regression coefficients,

Module II

Linear Programming: Concept, Formulation & Graphical and Simplex Solution, Assignment Models: Concept, Flood's Technique / Hungarian Method, applications including restricted & multiple assignments. Transportation Models: Concept, Formulation, Problem types: Balanced, Unbalanced, Minimization, Maximization Basic initial solution using North West Corner, Least Cost & VAM, and Optimal Solution using MODI.

Module-III

Queuing Theory: Concept, Single Server (M/M/I), Markov Chains & Simulation Techniques: Markov chains: Applications related to management functional areas, Decision Theory: Concept, Decision under risk (EMV) & uncertainty, Game Theory: Concept, Two players zero sum game theory with dominance, Pure & Mixed Strategy.

Course Outcomes:

- CO-1: Demonstrate proficiency with statistical analysis of data. To lay adequate theoretical foundation to study various applied fields in statistics. To know how global business decisions depends on the statistical analysis of data and specific relationship between two or more variables.

- CO-2: Develop the ability to build and assess data-based models. Quantitative analysis of data, problem solving approach and use of mathematical techniques.
- CO-3: Recognize the importance and value of Operations Research and linear programming in solving practical problems in real business world. Interpret the transportation models' solutions and infer solutions to the real-world problems. Optimize the allocation of resources to Demand points in the best possible way using various techniques and minimize the cost or time of completion of number of jobs by number of persons.
- CO-4: Recognize and solve game theory and Markove's chain. Know when simulation and dynamic programming can be applied in real world problems.
- CO-5: Learn the context around which decisions must be taken, evaluate all factors involved developing possibilities, how to assess each possibility against set criteria to identify the best option and then how to develop that into a successful decision. Develop leadership quality to handle projects in real situation by using scientific tools, and implement suitable quality control measures.

Text Books

1. Quantitative Techniques for Management, Levine, Krehbiel, Berenson, Pearson
2. Quantitative Techniques in Management by N.D. Vohra Tata, McGraw Hill
3. Quantitative Techniques-Davis.B, Oxford
4. Operations Research by R. Pannerselvam, Prentice Hall
5. Statistics for Business and Economics; R P Hooda, Vikas
6. Operations Research by Nita Shah, Ravi Gor, Hardik oni, PHI
7. Business Statistics : J K Sharma, Vikas

MBQT1002 BUSINESS RESEARCH (3-0-0)

Course Objectives:

1. To equip the students with the basic understanding of the research methodology in changing business scenario.
2. To provide an insight into the application of dynamic analytical techniques to face the challenges, aimed at fulfilling the objective of business decision making.
3. To equip the students with the basic understanding of the research methodology in changing business scenario.
4. To provide an insight into the application of dynamic analytical techniques to face the stormy challenges, aimed at fulfilling the objective of business decision making.
5. To gain practical experience in using MS Excel and SPSS for forecasting and estimation.

Module I

Introduction to RM:

Meaning and significance of research. Importance of scientific research in business decision making. Types of research and research process. Identification of research problem and formulation of hypothesis. Research Designs. Primary data, Secondary data, Design of questionnaire; Sampling fundamentals and sample designs. Measurement and Scaling Techniques, Data Processing. Ethical conduct in research.

Module II

Data Analysis – I: Hypothesis testing; Z-test, t-test, F-test, chi-square test. Analysis of variance (One and Two way). Non-parametric, Test – Sign Test, Run test, Kruskal– Wallis test.

Module III

Data Analysis – II: Factor analysis, Multiple Regressions Analysis. Discriminant Analysis (Concept)

Report writing and presentation: Research Report, Types and significance, Structure of research report, Presentation of report.

Module IV (Business Research Lab: Using MS Excel and SPSS):

Descriptive Statistics in 't' test, Testing of hypothesis, Chi-square, ANOVA, Correlation, Regression, Factor Analysis.

Course Outcomes:

CO-1: Utilize the knowledge of research methodology in solving various business problems.

CO-2: Distinguish various alternative course of action available for a particular situation.

CO-3: To introduce students to the tools and techniques of econometrics.

CO-4: To develop expertise in decision-making through the use of statistical tools and techniques.

CO-5: Judge and select best possible alternatives to solve business problems

Text Books:

1. Research Methodology by Khatua and Majhi, HPH.
2. Damodar Gujarati, Dawn C Porter, and Manoranjan Pal, Basic Econometrics, Mc Graw Hill
3. Research Methodology by Kothari, Newage
4. Research Methodology, by Deepak Chawla / NeenaSandhi (Vikas)
5. Management Research Methodology- Krishnaswamy, Pearson

Reference Books:

1. BRM by Zikmund / Babin / Carr / Adhikari / Griffin (Cengage)
2. Research Methodology, V. Upadade&A. Shende (S. Chand)
3. Business Research Methods by Prahlad Mishra, Oxford
4. Business Research Method by Cooper et.al, McGrawHill
5. Levin. Richard. I and Rubin. David. S 'Statistics for Management' Prentice-Hall
6. Brooks, Chris., 'Introductory Econometrics for Finance' Cambridge University Press
7. Hair, Anderson, Tatham and Black., 'Multivariate Data Analysis' Pearson Education India
8. Wooldridge M., Introductory Econometrics: A Modern Approach, Cengage Learning

Open Resources:

1. <https://dbie.rbi.org.in/>, <https://data.oecd.org/>

SYLLABUS

FOR

FIRST YEAR

INTEGRATED MBA PROGRAMME
(Effective from 2024-25)

2024-25
BIJU PATNAIK UNIVERSITY OF TECHNOLOGY, ODISHA
ROURKELA

COURSE STRUCTURE

FIRST SEMESTER

Category	Subject Code	Subject	L-T-P	Credit	University Marks	Internal Marks
THEORY						
1.	EV IMEV1001	English Language Communication	3-0-0	3	100	50
2.	EV IMEV1002	Business Organisation	3-0-0	3	100	50
3.	QT IMQT1001	Business Statistics	3-0-0	3	100	50
4.	PC IMPC1001	Basic Financial Accounting-I	3-0-0	3	100	50
5.	PC IMPC1002	Fundamentals of IT	3-0-0	3	100	50
Total			15-0-0	15	500	250
SESSIONAL / PRACTICAL						
6.	EV IMEV1201	English Language Communication Lab	0-0-2	2	-	100
7.	PC IMPC1201	Information Technology Lab	0-0-2	2	-	100
Total			15-0-4	04	-	200
Total Semester				19	500	450
Grand Total (Theory + Practical) = 950						

SECOND SEMESTER

Category	Subject Code	Subject	L-T-P	Credit	University Marks	Internal Marks
THEORY						
1.	EV IMEV1003	Business Communication	3-0-0	3	100	50
2.	EV IMEV1004	Social Psychology	3-0-0	3	100	50
3.	QT IMQT1002	Quantitative Methods-I	3-0-0	3	100	50
4.	PC IMPC1003	Basic Financial Accounting-II	3-0-0	3	100	50
5.	PC IMPC1004	Marketing Management-I	3-0-0	3	100	50
Total			15-0-0	15	500	250
SESSIONAL / PRACTICAL						
6.	EV IMEV1202	Business Communication Lab	0-0-2	2	-	100
7.	QT IMQT1201	Advance Excel- Lab	0-0-2	2	-	100
Total			15-0-4	04	-	200
Total Semester				19	500	450
Grand Total (Theory + Practical) = 950						

IMEV1001 ENGLISH LANGUAGE COMMUNICATION (3-0-0)

Course Objectives:

The objectives of the course are;

1. To provide an overview of the process and types of communication, causes of miscommunication, and strategies for effective communication
2. To familiarize the learners with requisites for using the four language skills, namely, Listening, Speaking, Reading, and Writing
3. To put in use the basic mechanics of grammar, usage, and punctuation.

Module I: Basics of Communication

The Process of Communication & its elements; Barriers to communication & Strategies for overcoming them, Non-verbal communication: Kinesics; Oculistics; Proxemics; Chronemics; Haptics; Paralanguage; Appearance and Artifacts. Communication network in an organization: The Grapevine; Downward, Upward, Horizontal and Diagonal Channels. 7Cs' of effective communication.

Module II: Listening, Speaking and Reading Skills

Listening: Importance; Types of listening: Active listening; Content listening; Empathic listening; Critical listening. Strategies for improving listening skills.

Speaking: Characteristics of Effective Speech- Clear articulation; Rate of speaking; Voice quality; Eye Contact; Relevance of content for the audience.

The Sounds of English, IPA symbols, The Syllable- Division of words into syllables - Problem sounds for Indian learners of English. Stress- Word stress, Contrastive Stress- Rules of Intonation (Falling and Rising tones) in English.

Reading: Developing reading skills of skimming and scanning; predicting, guessing the meaning of unfamiliar words, inferring; Extensive and Intensive Reading.

Module - III: The Writing Skill & English Grammar.

Writing: The Writing Process; Characteristics of effective writing: clear organization and structuring of ideas, clarity of language, stylistic variation. Paragraph writing; Summary/ précis writing; Note-making.

Applied English Grammar: English verb types: Main and Auxiliary verbs; Stative and Dynamic; Transitive and Intransitive. Tenses; Subject-verb concord; Non-finite forms; Conditionals & Relative clauses; Parallel Structures; Punctuation.

Course Outcomes:

After completing the course, the students will be able to:

- CO-1: Apply conceptual knowledge to enforce the basic concepts of communication, identify and overcome potential barriers in communication and use proper verbal and nonverbal modes of communication in an organisation.
- CO-2: Analyse and implement effective listening and speaking skills for proper articulation of words and sentences and maintain proper eye contact and prepare relevant content for audience.
- CO-3: Develop effective reading skills and maintain clarity in writing styles along with structuring ideas for stylistic variation in writing.
- CO-4: Use Basic Grammar effectively in writing and speaking.

Reference Books:

1. Communication Skills, Sanjay Kumar & Pushpa Lata, Oxford
2. An introduction to Professional English and Soft Skills: Das et al, BPUT TextBook.
3. Business communication- Meenakshi Raman & Prakash Singh, OUP.
4. Effective Technical Communication, Ashraf Rizvi, McGraw Hill India.
5. A University Grammar of English, Quirk et al, Pearson

IMEV1002 BUSINESS ORGANISATION (3-0-0)**Course Objectives:**

1. To provide the students an understanding of the nature of business activities and the environments within which they function.
2. To provide the theoretical and practical aspects of the operation of the various types and forms of business organizations.
3. To develop an understanding of the role of business activities in the modern world.

Module-I

Introduction to business: Meaning of business; nature of business; objectives of business; essentials of a successful business; qualities of a successful businessman; Classification of industries; Modern Business Environment: Characteristics, Challenges; Business Processes.

Business organization: Meaning: characteristics of an ideal form of business organization. Different forms of Business Organization

Module-II

Sole Trader: meaning; features; merits and demerits.

Partnership: meaning, characteristics; kinds of partners; partnership deed; advantages and disadvantages of partnership form of business organization: dissolution of partnership firms and different forms of Cooperatives.

Joint Stock Company: Meaning and definition; characteristics: kinds of companies; distinction between private and public company. merits and demerits of company form of business organization;

Statutory Corporations: Features, Merits & Limitations ; Formation of a company: Process.

Module-III

Organizational Structure: Formal and informal organization-Line Organization, Line and staff organization, Delegation, Decentralization, structural configurations of functional, Divisional, Matrix, Network, Virtual and learning organizations: Federal decentralization, Principles underlying designing of a structure.

Course Outcomes:

- CO-1: Explain the concept of the various constituents of organisations and their impact on businesses.
- CO-2: Demonstrate and develop conceptual framework of business organisations and generate interest in business.
- CO-3: Interpret the definition of ethics, the importance and role of ethical behaviour in the business world today.
- CO-4: Explain different ways of classifying businesses by size industries, sectors and industries type.

Reference Books:

1. Modern Business Organisation Management-S. A Sherleker, Himalaya Publishing House
2. Publishing House
3. Modern business Organisation-J P Mahajan- Himalaya Publishing House

IMEV1003 BUSINESS COMMUNICATION (3-0-0)**Course Objectives:**

1. To familiarize the learners with different formats of organizational communication
2. To infuse the correct practices and strategies of effective business writing and business presentation.
3. To put in use the basic mechanics of grammar, usage, and punctuation.
4. To impart instructions for preparing impressive Resumes.
5. To make the students ready for effective Group Discussions and impressive performance in job interviews.

Module-I: Writing Letters, Memos,E-mail:

- The Writing Process; Guidelines for composing effective messages;
- Business Letter: Parts of a Business Letter; Formats for typing a business letter; Writing routine, good-news & bad-news messages; Writing persuasive messages.
- Business Memo;
- Effective e-mail writing; Rules of Netiquette.
- Business Report:Features of a good business report. Formats- Printed form, Memo, Letter, manuscript; Structure of a short Formal Report. Steps in planning and preparing a business report.

Module-II: Designing & Delivering OralPresentations:

- Presentations: Planning, Preparing, Practicing, and delivering oral presentations; Enhancing oral presentations with Visual aids; Overcoming Stage Fright; Importance of body language during presentations; Question-Answer session after the presentation.
- Meetings: Preparing a notice-cum-agenda; Chairperson's role; Other role functions in a meeting; Content of the minutes of a meeting.
- Cross cultural communication: Technology in use - Video conferencing - Google Meet - Teams - Zoom: Arranging meetings.
Social Media - Artificial Intelligence & Communication prompts.

Module-III: Writing employment messages and taking part in GD & Interviews:

- Preparing resumes and Job application letters; Resume: Parts of a Resume- Resume Styles: Chronological, Functional, and Chrono- Functional- Resume Design- Job Application letter.
- Group discussion: Types; How to prepare for GD; Parameters of Evaluation; Role Functions in GD; Non-functional Behaviour Patterns in GD; Guidelines for Effective Group Discussions.
- Interviews: Types by purpose; 3 stages of an interview; how to prepare for an interview; how to answer FAQs; Following up with a letter of thanks.

Course Outcomes:

After completing the course, the students will be able to:

CO-1: Distinguish among various levels of organizational communication and

communication barriers while developing an understanding of communication as an organizational process.

CO-2: Develop awareness of Techniques of active Listening and fluent speaking.

CO-3: Apply the reading strategies of Skimming, Scanning, and Inferring in the comprehension of the reading texts of various types.

CO-4: Demonstrate the ability to compose reasonably error-free business correspondence with brevity and clarity.

CO-5: Apply Creative thinking as well as critical thinking in preparing his/her resume, in writing Reports, and in taking part in Group Discussions, and in designing PPTs for presentation.

CO-6: Use appropriate communication skills in multicultural contexts, in social media, in web meetings, and in web browsing.

Books:

1. Business Communication Today - Bovee, Thill, Schatzman
2. Business Communication, Meenakshi Raman & Prakash Singh, Oxford
3. Business Communication- concepts, cases & applications, Chaturvedi & Chaturvedi, Pearson
4. Communication for Management, Urmila Rai and S M Rai, HPH
5. Business and Managerial Communication, Sengupta, PHI
5. Business Communication for Managers, P. Mehra, Pearson
6. BCOM- Business Communication, Lehman, Sinha, Cengage

IMEV1004 SOCIAL PSYCHOLOGY (3-0-0)

Course Objectives:

1. Understand the socio-cultural influences on human development and behavior
2. Exhibit the ability to work respectfully and constructively with individuals of different backgrounds, values, and experiences
3. Demonstrate the ability to integrate multicultural concepts into psychology research, theory, practice, and service to others
4. Describe key concepts, principles, and overarching themes in psychology

Module-I

Introduction: Definition, Scope, Methods and Branches of Psychology (with special reference to Industrial/ Organization Psychology) , Major Viewpoints- Behavioristic approach, Gestalt, School, Psychoanalytic School.

Module-II

Sensation, Attention and Perception: (a) Attributes and classification of sensation (b) Attention Determinants, Shift, Fluctuations, Distraction, (C)

Module-III

Learning Process: Factors of Learning, Theories- Connectionism, Classical and Operant Conditioning, Programmed Learning.

Memory: Encoding, Storage, Retrieval, STM, LTM, Other types , Forgetting- its causes.

Emotion: Reaction (types) Psychological basis.

Intelligence: Definition, Concept of IQ, Emotional Intelligence

Personality: Definition, Types, Traits, Tests

Course Outcomes:

- CO-1: Develop insight and analyse the contribution of social psychologists to the understanding of human society.
- CO-2: Evaluate effective strategies in socialization, group processes (both inter and intra-group) and helping behaviour.
- CO-3: Register the progression of theories in major areas in Social Psychology.
- CO-4: Interpret attitude formation and various methods to be used to change the attitude.
- CO-5: Interpret aspects related to social psychology.

Books:

- Atkinson, R.L., Atkinson, R.C. Smith, E.E. & Hilgard, ER: Introduction to Psychology, Harcourt Brace Java Publisher.
- Baron, R.A: Psychology: The Essential Science, Allyn and Bacon.
- Morgan, C.T., King, R.A. Weisz, J.R. and Schopler, J: Introduction to Psychology McGraw Hill
- Munn, NL, Ferland, L.D., and Freeland, P.S. : Introduction to Psychology, Oxford, IBH Publishing.
- Woodworth, R.S., & Scholberg, H: Experimental Psychology, Oxford & IBH Publishing.

IMEV1201 ENGLISH LANGUAGE COMMUNICATION LAB (0-0-2)**Course Objectives:**

1. To improve the learners' proficiency in Listening, Speaking, Reading and Writing skills in English.
2. To enhance their active vocabulary by at least 300 new words.
3. To enable them to speak words and sentences with correct pronunciation of English sounds and with proper stress and information.

Lab sessions will be used to provide practice activities based on the content of all three modules of theory, with particular emphasis on the following:

1. Listening exercises
 - (i) Taking a dictation
 - (ii) Listening with a focus on pronunciation: segmental sounds, stress, weak forms, intonation.
 - (iii) Listening for meaning: listening to a short talk / news bulletin.
 - (iv) Taking notes from a lecture / speech.
2. Reading exercises
 - (i) Reading comprehension; Speed reading practice
 - (ii) Note making after reading a text, showing the main idea and supporting ideas and the relationship between them.
3. Writing exercises
 - (i) Practice in writing paragraphs based on a Topic Sentence,
 - (ii) Writing a Summary / Precis.
4. Phonemic transcription using IPA symbols.
 - (i) Transcription of words in normal English orthography (writing) into IPA symbols
 - (ii) Phonemic transcription of words presented orally
 - (iii) Syllable division and stress marking (in words presented in phonetic transcription)

5. Speaking exercises
 - (i) Introducing oneself and others
 - (ii) Pronunciation practice (for accent neutralization), particularly of problem sounds, in isolated words as well as sentences.
 - (iii) Practicing word stress, and intonation.
 - (iv) Practice of 2 Minutes' speech on a contemporary topic.
6. Vocabulary exercises

Course Outcomes:

After completing the course, the students will be able to:

- CO-1: Use conceptual knowledge of communication and use effective body language and proper articulation by implementing rules of pronunciation.
- CO-2: Analyse and implement effective listening and speaking skills for proper articulation of words and sentences and focus on accent neutralisation.
- CO-3: Develop effective writing styles along with structuring ideas for stylistic variation in writing for effective documentation.
- CO-4: Use Basic Grammar effectively in writing and speaking and implement remedial measures to improve the same.

Book for Reference:

1. English Communication Skills- Raman & Singh
2. Effective Technical Communication- Ashraf Rizvi.

IMEV1202 BUSINESS COMMUNICATION LAB (0-0-2)

Course Objectives:

1. To enable the learners to draft appropriate messages in Business Letters, Memos, and E-mails in the correct format.
2. To give the learners practice in making presentations.
3. To give them practice in preparing impressive Resumes
4. To impart the ability to actively participate in GDs and to perform satisfactorily in job interviews.

The following are the main Activities to be conducted in Lab classes.

1. Delivering short speeches of 2 Minutes' duration.
2. Delivering PPT Presentations individually and in teams.
3. Writing Business Letters
4. Writing Memos and E-mails.
5. Group Discussions
6. Mock interviews
7. Vocabulary exercises

Course Outcomes:

After completing the course, the students will be able to:

- CO-1: Draft business letters, memos and e-mails in the correct form with reasonable accuracy of content.
- CO-2: Deliver effective PPT presentations both individually and in a group.
- CO-3: Participate in group Discussions with adequate content and analysis.
- CO-4: Internalise effective techniques of answering questions and interacting in job interviews.

CO-5: Attain fluency in speech with enhancement of active vocabulary by at least 150 new words.

Reference Books:

1. English Language Lab, Nira Kanor, PHI
2. Guide to managerial Communication, Mary Munter, Pearson

IMPC1001 BASIC FINANCIAL ACCOUNTING - I (3-0-0)

Course Objectives:

1. To understand the need of accounting for a business.
2. To familiarize the students about the process of Accounting.
3. To know about the result of a business reflected by accounting statements.

Module -I

Introduction: Accounting as a language of business and need of Accounting, Accounting & Book keeping, Importance & objectives of Accounting, Basic Terminologies, users of accounting information, limitations of accounting, Accounting concepts & conventions, Accounting Standards, Accounting Equation and effect of transactions on Accounting Equation.

Module- II

Accounting Cycle, Type of Account, Journal, meaning, steps in Journalizing, golden rules for journal. Leger as book of secondary entry, process of ledger posting, Subsidiary book: Cash book single column, double column, triple column cash book and petty cash book, Trial Balance, meaning objectives and methods of preparing Trial Balance

Module- III

Capital Expenditure, Revenue Expenditures and Deferred Revenue Expenditure, Final Account: Preparation of Trading Account, Profit and Loss Account and Balance sheet, Final Account with Adjustment: Closing stock, outstanding expenses, prepaid expenses, Accrued Income, Provision for bad debt and Depreciation.

Course Outcomes:

- CO-1: Interpret the process of accounting, uses and limitations.
CO-2: Identify the accounting concepts, principle and conventions.
CO-3: Solve, and examine the Journal Entries, Ledger, and Trial Balance.
CO-4: Prepare Financial Statements, Trading, Profit & Loss and Balance Sheet.

Reference Book:

1. Double Entry Book- Keeping, Juneja, Arora, Chawla, Kalyani
2. Financial Accounting, Maheshwari, Vikas
3. Financial Accounting Principle and Practices, Lal & Srivastava, S. CHAND

IMPC1002 FUNDAMENTALS OF IT (3-0-0)

Course Objectives:

The aim of this course is to:

1. Provide fundamental concepts and importance of Information Systems (IS) in modern business environments.

2. Provide knowledge of Database Management Systems (DBMS) and their role in data organization and management.
3. Explore the basics of Computer Networks, Internet Security, and their implications for business operations and data protection.
4. Learn about emerging trends in computing technologies and their applications in business and commerce.

Module - I:Information Systems for Business:

Need for Information Systems (IS), Business in the Information age, Information systems Concepts, Role of IT in various functional areas of business – Accounting & Finance, Marketing & Sales, Production & Logistics, and Human Resources Management Systems.

Module - III:Database Management Systems:

Database, Types of Databases, Components of a Database system. DBMS, DBMS language, Advantage and limitations of Database, Database models. Systems Planning - Traditional system development lifecycle (SDLC) - alternate methods for system development-dataflow analysis, System development outside the system.

Module-III: Basic Concepts of Computer Network &Internet Security:

Data Communication & Computer Network – Definition, Network Topologies Network Devices, Wireless Networking. Types of attacks, DOS attacks, Malicious Software, Hacking, Security Services, Security Mechanisms - Cryptography, Digital Signature, Firewall, Types of Firewalls, Identification& Authentication. ECommerce Overview- E-commerce Applications, M-Commerce Services & Applications, Emerging Trends in Computing.

Course Outcomes:

After completing the course, the students will be able to:

- CO-1: Analyze and assess the role of information technology in diverse functional areas of business and its influence on strategic decision-making processes.
- CO-2: Design and execute basic database management systems utilizing suitable database models and languages.
- CO-3: Students will be able to evaluate network topologies, identify security threats, and apply appropriate security mechanisms to mitigate risks.
- CO-4: Engage in discussions regarding emerging computing trends, including e-commerce applications, and their impacts on fostering business innovation and competitiveness.

Reference Books:

1. Foundations of Computing, 5th Edition, Sinha and Sinha, bpb publication
2. Management Information Systems: Managing the Digital Firm" by Kenneth C. Laudon and Jane P. Laudon
3. Database System Concepts, Seventh Edition by Avi Silberschatz, Henry F. Korth, S. Sudarshan, McGraw-Hill
4. Simplified Approach to DBMS By Parteek Bhatia Gurvinder Singh, Kalyani

IMPC1003 BASIC FINANCIAL ACCOUNTING - II (3-0-0)

Course Objectives:

1. To comprehend the significance of corporate accounting in financial reporting and management.

2. To master the processes involved in the issuance, management, and redemption of shares and debentures.
3. To apply advanced tools and techniques for financial statement analysis, including ratio analysis and cash flow statement evaluation.
4. To evaluate financial performance and make informed decisions based on comprehensive financial analysis.

Module-I: Accounting for Share Capital

Meaning and Importance of Corporate Accounting, Issue of shares, Payment in instalment, Journal entries for calls in Arrear and call-in advance, Forfeiture and Re-Issue of shares. Buyback of shares, understanding corporate Income statement and Balance sheet as presented in the Annual report of Companies.

Module-II: Accounting for Debentures

Issue of Debenture and Its classification, Different terms of issue of debenture, Redemption of debenture, Final accounts of limited liability companies as per the existing company Act, 2013 Contingency and events occurring after the balance sheet.

Module- III: Financial Statements analysis

Meaning, definition, objectives and uses of financial statement analysis, Tool or Techniques and Types of financial statement analysis. Ratio analysis: Meaning, advantages and disadvantages, Types of ratios, Interpretation of ratio. Cash flow statement analysis, meaning, format, cash flow from operating activities, Investing Activities and Financing Activities (Indirect Method).

Course Outcomes:

- CO-1: Demonstrate proficiency in recording transactions related to share capital, including installment payments, calls in arrears, and advanced calls.
- CO-2: Apply knowledge of debenture issuance, classification, redemption, and compliance with regulatory requirements under the Companies Act, 2013.
- CO-3: Utilize financial statement analysis tools and techniques to interpret corporate income statements, balance sheets, ratio analysis, and cash flow statements.
- CO-4: Evaluate financial performance, liquidity, profitability, and solvency using advanced financial analysis methods, preparing them for roles in financial management and reporting.

Reference Book:

1. Double Entry Book-Keeping, Juneja, Arora, Chawla, Sahoo, Kalyani
2. Financial and Management Accounting, Satapathy & Sahoo, Vrinda
3. Financial Accounting and Analysis, Athma, HPH

IMPC1004 MARKETING MANAGEMENT - I (3-0-0)

Course Objective:

1. To sensitize the students to the dynamic nature of Marketing Management.
2. To expose students to a systematic frame work of marketing & implementations and to highlight need for different marketing approaches for services, goods, and for household consumers, organizational buyers.
3. To introduce the concept of Marketing Mix as a framework for Marketing Decision making.

4. The course is intended for defining and clarifying the concepts of marketing.

Module-I

Definition & Functions of Marketing:

Scope of Marketing, Core concepts of Marketing such as Need, Want, Demand, What can be marketed

Four Utilities of Marketing, Customer Perceived Value, Customer Satisfaction, Customer Delight, Customer Loyalty and types

Simple Marketing System, Modern Marketing System,

Evolution of Marketing concepts: Production, Product (with Marketing Myopia), Selling, Marketing and holistic

Understanding Markets: Potential market, Available market, Qualified available market, Target market, Penetrated market

Types of Market : B2B, B2C, B2G, Global, Not for Profit, Government, Marketplace, Marketspace, Metamarket,

Marketing v/s Market, Selling versus Marketing, Marketing Myopia. 80: 20 Principle, Bottom of the pyramid concept, Market Share, Market Size

Module-II

Concept of Marketing Environment: Need for analyzing the Marketing Environment. Macro and Micro environmental analysis or PESTEL analysis

STP concept -Segmentation: Definition, Need for segmentation, Benefits of segmentation to marketers, Criteria for effective segmentation,

Bases for market segmentation of consumer goods - Demographic, Geographic, Psychographic, Behavioural

Target Market: Concept of target market and criteria for selection of target market

Positioning: Concept of differentiation & positioning, Introduction to the concepts of Value Proposition, Point of Parity, Point of Difference or USP, Positioning errors.

Marketing Mix tools: 4Ps, 4As, 5Ps, 7Ps. Only concepts

Packaging & Labeling: Meaning & role of Packaging & Labeling.

Module-III

Understanding Consumer Behaviour:

Meaning & importance of Consumer behaviour, Difference between Customer and Consumer, Difference between Consumer buying behaviour and Organizational buying, Buyer roles , Factors affecting buying behaviour, Stages or Steps in consumer buying decision process, Buyer Black Box

Contemporary Topics (Concepts only) : Viral Marketing, Guerrilla Marketing, Ambush Marketing, Upselling and Cross selling, Societal and social Marketing, Relationship Marketing, Green Marketing , Digital Marketing, Network or Multi-level marketing, FOMO marketing, Customer Life Time Value

Course Outcomes:

CO-1: Identify the key analytical frameworks and tools used in marketing.

CO-2: Utilize the information of a firm's external and internal marketing environment to identify and prioritize appropriate marketing strategies.

CO-3: Design Segmentation, Targeting and Positioning strategies.

CO-4: Analyse different Buying Roles and interpret Consumer Buying Behaviour.

Text Books:

1. Marketing Management- A South Asian Perspective,13th Edition- Authors – Kotler, Keller, Koshy, Jha
2. Rajan Saxena, Marketing Management, TMH

Reference:

The above module has been prepared by referring to NPTEL Marketing Management-I Course by Prof. Jayanta Chatterjee and Prof. Shashi Shekhar Mishra | IIT Kanpur

IMPC1201 INFORMATION TECHNOLOGY LAB (0-0-2)

Course Objectives:

1. To know about the concept of Google Sheet and its Applications.
2. To know about the concept of DBMS/ RDBMS using MySQL / Oracle / Access.

Module - I

Introduction to Computer System, OS, Internet etc., Acquire the essentials for using & working with Google Services: Docs, Sheet, Presenter and Sites etc. Google Forms: Google's Form and Response sheet creation, in this section, you will learn how to send and receive forms through Google Drive so you can review them instantaneously. Google Mobile Apps: One of the greatest parts of using Google is its portability. This section shows you how to optimize the apps on your mobile device. Google Class Room: Learn about the Google Class Room, its use, importance, how teachers use it for assignments, mark etc. Google Calendar: Use of Google Calendar, how it is used, its importance etc. Google Sites: How to create site of your own using Google site, Over View of HTML, Design and importance of Web Design and Development. You Tube: Concept of You Tube, How to create You Tube Channel, Create short videos. Google Photo: Learn about the Google Photo, its use, importance, how teachers use it for editing photos, Uploading Photos etc.

Module - II

Introduction to DBMS / RDBMS using Oracle or MySQL, Learning Basic DML and DDL, Commands, Create, Alter, Truncate, View commands, Insert, Select, Delete, Update, Sort, Replace commands

N.B: All Computers must have Internet Connection and Assignments should design and developed by concerned faculty for students as per syllabus.

Course Outcomes:

CO-1: Create, Edit, Print and Share documents.

CO-2: Create, Edit, Print, Share and Present the Presentation.

CO-3: Apply the understanding of how various information & data representation in Spreadsheet.

CO-4: Outline the role of the Internet and ethical, social, & security issues of Internet Uses.

Text Books

- Google Apps for Dummies Karl Barksdale
- Learning Google Apps: Ramalingam Ganapathy
- Learning MySQL by Seyed M. M. Tahaghoghi

IMQT1001 BUSINESS STATISTICS (3-0-0)

Course Objectives:

1. To learn adequate theoretical; concept of statistics in various applied field in management decision making
2. To understand role of statistical tools in managerial decision making
3. To understand the applications of various quantitative techniques in managerial setting.

Module-I:

Statistics Introduction: Meaning and definitions of statistics; importance of statistics in business; limitations of statistics; types of data, collection of data; classification and tabulation of Data; graphic and diagrammatic presentation of Data. Measures of Central Tendency Introduction: The Arithmetic Mean; The Median: The Mode; comparison between mean, median and mode: The geometric Mean; The Harmonic Mean.

Module-II:

Measures of Dispersion: Introduction; The Range: The Quartile Deviation: The Mean Deviation; The Standard Deviation; Coefficient of Variation. Introduction, Skewness; Measures of Skewness; Moments; Kurtosis.

Module-III:

Probability, Introduction; Basic terminology in Probability; three types of Probability. Probability Axioms; Probability under conditions of statistical independence and dependence: Bayes' Theorem.

Course Outcomes:

- CO-1: Collect, organize, and analyse data using appropriate statistical techniques and software tools.
- CO-2: Demonstrate proficiency in descriptive statistics, including measures of central tendency, dispersion, and graphical representation of data.
- CO-3: Build and evaluate predictive models using statistical methods, enabling them to forecast future trends, identify patterns, and make strategic decisions based on predictive analytics.
- CO-4: Develop a solid understanding of probability theory and its applications in business contexts.

Books:

1. Statistics for Management - Lavin & Rubbin (TMH)
2. Statistical Methods and Quantitative Techniques- Digambar Patri (KP)

IMQT1002 QUANTITATIVE METHODS - I (3-0-0)

Course Objectives:

1. To learn adequate theoretical; concept of Quantitative techniques in various applied field in management decision making
2. To understand role of optimization techniques in managerial decision making
3. To understand the applications of various quantitative techniques in managerial setting.

Module-I:

Linear Programming:

Basic concept; Structure of Linear Programming Model; Application areas of Linear Programming. General Mathematical Model of Linear Programming Problem; Guidelines on Linear Programming Model Formulation; Examples of LP Model Formulation in various functional areas of management; Graphical Solution Method of LP Problems, The Simplex Method(Maximization Case; Minimization Case-Two Phase Method & Big M Method).

Module-II:

Transportation Problem:

Transportation Problem; Methods for Finding Initial Solution (North-West Corner Method, Least Cost Method, Vogel's Approximation); Test of Optimality- MODI Method
Assignment Problem: Assignment Problem, Solution Methods of Assignment Problem- Hungarian Method for solving Assignment Problem; Variations in the Assignment Problem- Multiple Optimal solutions, Maximization Case in Assignment Problem, Unbalanced Assignment Problem, Restrictions on Assignments.

Module-III:

Decision Theory and Decision Tree:

Steps of Decision-making Process; Types of Decision Making Environment, Decision Making under Uncertainty (Optimism Criterion, Pessimism Criterion, Equal Probabilities criterion, Coefficient of Optimism Criterion, Regret Criterion); Decision Tree Analysis, Decision Making with Utilities.

Course Outcomes:

CO-1: Interpret Fundamental Concepts of Linear Programming.

CO-2: Evaluate and Solve Transportation Problems.

CO-3: Analyse and Solve Assignment Problems.

CO-4: Demonstrate Decision-Making Skills in Quantitative Environments.

Books:

1. Gupta & Hira, Operations Research, S.Chand.
2. Sharma, Operations Research, Macmillan

IMQT1201 ADVANCE EXCEL - LAB (0-0-2)**Course Objectives:**

1. To master fundamental Excel functionalities including data entry, formatting, and basic formula usage.
2. To develop proficiency in advanced Excel features such as conditional formatting, data manipulation, and table creation.
3. To acquire skills in utilizing Excel shortcuts, functions, and data analysis techniques.
4. To gain an understanding of data visualization principles and practical applications within Excel.

Module - I

Introduction to Excel, Advance Excel, Data & Information. Excel Variables, Difference between DBMS and Excel Workbook. Creating, Entering, Editing and Formatting Data, Basic & Conditional Formatting Data, Managing Worksheets, Modifying Rows and Columns, Understanding Formulas and Functions, Changing Views, Data Freezing,

Merging, Custom Fills, AutoFill and Flash Fill, Use of Format Painter, Shapes. Creating Tables and Difference between Table and sheet Data.

Module - II

Excel Shortcuts, Copy, Paste and Paste Special options. Cell, Cell naming and Cell Referencing, Types of reference in Excel, Ranges and Dates, Difference between Formula and Function, Types of Function, Use of Text Functions. Use of Mathematic and Statistics functions Searching, Sorting, Filtering Data, Data Counting, Conditional Logic using If and Nested If, Difference between Total and Subtotals, Advance Data Filtering, Use of What-If Analysis, Data Ammonization in Excel, Data Validation, Data Protection, Introduction to Data Visualization, Visualize simple data and conditional data, Use of Look ups in Excel.

Course Outcomes:

- CO-1: Demonstrate proficiency in Excel for data entry, formatting, and basic formula manipulation.
- CO-2: Apply advanced Excel features including conditional formatting, data filtering, and table creation to manage and analyze data effectively.
- CO-3: Utilize Excel shortcuts, functions, and data analysis techniques to streamline workflows and make informed decisions.
- CO-4: Create visually appealing and informative data visualizations using Excel's visualization tools and functions.

Text Books:

- Microsoft Excel All in one by Greg Harvey
- Microsoft Excel Quick Start Guide for Beginners by William Fischer

SYLLABUS

FOR

FIRST YEAR

MCA PROGRAMME

(Effective from 2024-25)

2024-25

**BIJU PATNAIK UNIVERSITY OF TECHNOLOGY, ODISHA
ROURKELA**

COURSE STRUCTURE

FIRST SEMESTER

Category	Subject Code	Subject	L-T-P	Credit	University Marks	Internal Marks	
THEORY							
1.	BS	MCBS1001	Discrete Mathematics	3-0-0	3	100	50
2.	PC	MCPC1001	Digital Logic Design	3-0-0	3	100	50
3.	PC	MCPC1002	Computer Networks	3-0-0	3	100	50
4.	PC	MCPC1003	Programming for Problem Solving	3-0-0	3	100	50
5.	PC	MCPC1004	Database Management Systems	3-0-0	3	100	50
6.	HS	MCHS1001	Communicative English	2-0-0	2	100	50
Total				17-0-0	17	600	300
SESSIONAL / PRACTICAL							
7.	PC	MCPC1201	Computer Networks Lab.	0-0-3	1.5	-	100
8.	PC	MCPC1202	C Programming Lab	0-0-3	1.5	-	100
9.	PC	MCPC1203	Database Management Systems Lab	0-0-3	1.5	-	100
10.	HS	MCHS1201	Language Lab	0-0-3	1.5	-	100
Total				17-0-12	06	-	400
Total Semester					23	600	700
Grand Total (Theory + Practical) = 1300							

SECOND SEMESTER

Category	Subject Code	Subject	L-T-P	Credit	University Marks	Internal Marks	
THEORY							
1.	PC	MCPC1005	Object-Oriented Programming using JAVA	3-0-0	3	100	50
2.	PC	MCPC1006	Software Engineering	3-0-0	3	100	50
3.	PC	MCPC1007	Data Structures	3-0-0	3	100	50
4.	PC	MCPC1008	Computer Organization and Architecture	3-0-0	3	100	50
5.	PC	MCPC1009	Theory of Computation	3-0-0	3	100	50
6.	HS	MCHS1002	Universal Human Values & Professional Ethics	2-0-0	2	100	50
Total				17-0-0	17	600	300
SESSIONAL / PRACTICAL							
7.	PC	MCPC1204	Object-Oriented Programming Lab	0-0-3	1.5	-	100
8.	PC	MCPC1205	Software Engineering Lab	0-0-3	1.5	-	100
9.	PC	MCPC1206	Data Structures Lab	0-0-3	1.5	-	100
10.	PC	MCPC1207	Programming in Python Lab	0-0-3	1.5	-	100
Total				17-0-12	06	-	400
Total Semester					23	600	700
Grand Total (Theory + Practical) = 1300							

MCBS1001 DISCRETE MATHEMATICS (3-0-0)

Course Objectives:

1. To learn the mathematical foundations required for computer science.
2. This course will help in understanding other courses in computer science.

Learning Outcomes:

Upon completion of this course, students will be able to:

CO1 : Define & describe various logical connectives and expressions along with rules of inferences.

CO2 : Apply various methods of proofs and proof strategies.

CO3 : Learn the concepts of function and develop the various algorithms and its complexity.

CO4 : Model counting techniques using recurrence relations & generating functions for applications.

CO5 : Develop the concepts and applications of graphs in various computer science problems

Module 1:

Logic and Proofs: Propositional logic, Propositional Equivalences, Predicates and Quantifiers, Nested Quantifiers, Rules of Inference, Introduction to Proofs. Sets: Venn Diagrams, Subsets, The size of a set, Power Sets, Cartesian Products, Set Operations.

Module 2:

Functions: One-to-One and Onto Functions, Inverse Functions and Compositions of Functions Partial Functions. Sequences and Summations. Algorithms, Searching Algorithms: Linear Search, Binary Search, Sorting: Bubble Sort, Insertion Sort, The Growth of Functions, Complexity of Algorithms.

Module 3:

Counting: The Basics of Counting, The Pigeonhole Principle, Permutations and Combinations, Binomial Coefficients, Recurrence Relations.

Relations: Relations and their Properties, n-ary Relations and their Applications, Representing Relations, Closure of Relations, Equivalence Relations, Partial Orderings.

Module 4:

Graphs: Graph Terminology and Special Types of Graphs, Bipartite Graphs, Representing Graphs: Isomorphism of Graphs, Euler and Hamilton Paths, Shortest Path Problems: Dijkstra's Algorithm, Traveling Salesperson Problem, Planar Graphs, Graph Coloring. Trees: Tree Traversal, Minimum Spanning Trees.

Text Books:

1. Kenneth H. Rosen, Discrete Mathematics and its Applications, Mc Graw Hills International Seventh Edition.
2. C. L. Liu, "Elements of Discrete Mathematics", McGraw Hills International Second Edition.

Reference Books:

1. Elements of Discrete Mathematics by C. L. Liu and D.P. Mohapatra, TMH, 2012
2. J. P Tremblay, R. Manohar, "Discrete Mathematical Structures with Applications to Computer Science", TMH, 1997.

MCHS1001 COMMUNICATIVE ENGLISH (2-0-0)**Course Objectives:**

This course is designed to enhance the communication skills of MCA students, focusing on the specific needs of computer science professionals. The syllabus aims to develop proficiency in English for academic, professional, and everyday use.

Course Outcomes:

- CO1: Students will be able to articulate the basic principles and processes of communication, identify and overcome common barriers, and distinguish between verbal and non-verbal communication methods.
- CO2: Students will demonstrate improved listening skills through active listening techniques, effective comprehension, and the ability to engage in clear and confident public speaking, group discussions, and role plays.
- CO3: Students will develop proficiency in writing professional documents including emails, memos, business letters, and technical reports, ensuring proper format, etiquette, and avoidance of plagiarism.
- CO4: Students will be capable of preparing and delivering effective presentations using appropriate visual aids and tools, while also demonstrating a strong grasp of English grammar including state and event verbs, tense and aspect, and subject-verb agreement.
- CO5: Students will understand the dynamics of interpersonal communication, the importance of workplace ethics, and cross-cultural communication. They will also learn to effectively communicate within teams, understand roles and responsibilities, and utilize collaborative tools and technologies.
- CO6: Students will enhance their reading comprehension and critical analysis skills for both technical and non-technical texts, expand their vocabulary with strategies for learning new words and technical terms, and develop skills for writing effective blogs, social media posts, and website content.

Module 1: BASICS OF COMMUNICATION

1. Introduction to Communication: Definition and Process; Types of Communication: Verbal and Non-verbal; Barriers to Effective Communication
2. Listening Skills: Active Listening Techniques; Barriers to Effective Listening; Listening Comprehension Exercises
3. Speaking Skills: Basics of Pronunciation and Intonation; Public Speaking: Techniques and Practice; Group Discussions and Role Plays

Module 2: PROFESSIONAL COMMUNICATION

1. Business Writing: Email Writing: Format and Etiquette; Writing Memos and Notices; Business Letters: Inquiry, Complaint, and Job Application Letters; Writing Technical Reports; Avoiding Plagiarism
2. Presentation Skills: Preparing Effective Presentations; Visual Aids: Use of PowerPoint and Other Tools; Delivering Presentations with Confidence
3. Basics of English Grammar: State and Event Verbs; Tense and Aspect; Subject-Verb Agreement

Module 3: INTERPERSONAL SKILLS

1. Interpersonal Communication: Building Relationships through Communication; Importance of Ethics at the Workplace; Cross-Cultural Communication
2. Teamwork and Collaboration: Effective Team Communication; Roles and Responsibilities in a Team; Collaborative Tools and Technologies
3. Interview Skills: Preparing for an Interview; Common Interview Questions and Answers; Mock Interviews and Feedback

Module 4: ENHANCING LANGUAGE SKILLS

1. Reading Comprehension: Techniques for Effective Reading; Critical Reading and Analysis; Reading Technical and Non-Technical Texts
2. Vocabulary Building: Strategies for Learning New Words; Using Context Clues; Technical Vocabulary for Computer Science
3. Writing for the Web: Writing Blogs and Articles; Social Media Communication; Writing Content for Websites

TEXTBOOKS:

1. "Technical Communication" by Mike Markel
2. "English for Technical Communication" by Aysha Viswamohan
3. "Effective Technical Communication " by M Ashraf Rizvi

MCHS1201 LANGUAGE LAB (0-0-3)

These lab experiments aim to provide practical, hands-on experience in various aspects of communicative English, tailored to the needs of MCA students.

List of Experiments:

Module 1: BASICS OF COMMUNICATION

Experiment 1: Communication Role Play

Objective: Understand verbal and non-verbal communication.

Activities:

1. Role-play different scenarios (e.g., a business meeting, a social gathering) focusing on body language, gestures, and spoken words.
2. Identify and discuss the barriers encountered.

Experiment 2: Active Listening Exercises

Objective: Enhance listening skills.

Activities:

1. Listen to a recorded speech and answer comprehension questions.
2. Engage in a paired listening activity where one student speaks and the other practices active listening, followed by feedback.

Module 2: PROFESSIONAL COMMUNICATION

Experiment 3: Email Writing Practice

Objective: Develop proficiency in writing professional emails.

Activities:

1. Write emails for different purposes (e.g., inquiry, complaint).
2. Peer review and discuss the format, tone, and etiquette of each email.

Experiment 4: Presentation Preparation and Delivery

Objective: Improve presentation skills.

Activities:

1. Prepare a PowerPoint presentation on a technical topic.
2. Deliver the presentation to the class, focusing on clarity, confidence, and use of visual aids. Receive and give constructive feedback.

Module 3: INTERPERSONAL SKILLS

Experiment 5: Team Communication Simulation

Objective: Enhance teamwork and collaboration skills.

Activities:

1. Engage in a group project simulation where roles and responsibilities are assigned.
2. Use collaborative tools (e.g., Google Docs) to work together and present findings.

Experiment 6: Mock Interviews

Objective: Prepare for job interviews.

Activities:

1. Participate in mock interviews with common interview questions.
2. Receive feedback on responses, body language, and overall performance from peers and instructor.

Module 4: ENHANCING LANGUAGE SKILLS

Experiment 7: Critical Reading Analysis

Objective: Improve critical reading skills.

Activities:

1. Read a technical article and identify key points, arguments, and conclusions.
2. Discuss the article in groups, focusing on analysis and interpretation.

Experiment 8: Vocabulary Building Exercises

Objective: Expand vocabulary.

Activities:

1. Use context clues to understand and define new technical terms from computer science texts.
2. Create flashcards for new vocabulary and engage in peer quizzes.

Experiment 9: Writing a Technical Blog

Objective: Develop web writing skills.

Activities:

1. Write a blog post on a recent technological advancement or trend.
2. Peers review the posts focusing on clarity, conciseness, and engagement.

Experiment 10: Social Media Communication

Objective: Practice concise and effective writing for social media.

Activities:

1. Create social media posts (e.g., tweets, LinkedIn updates) about a technical topic.
2. Discuss the effectiveness and engagement of each post, considering the target audience.

MCPC1001 DIGITAL LOGIC DESIGN (3-0-0)

Course Objectives:

1. To introduce the fundamental concepts of digital logic and Boolean algebra.
2. To develop and understanding of combinational and sequential logic circuits.
3. To explore advanced topics such as memory elements, state machines, and programmable logic devices.

Course Outcomes: Upon successful completion of this course, students should be able to:

CO1 : Analyze and design combinational logic circuits using Boolean algebra and Karnaugh maps.

CO2 : Design and implement sequential logic circuits, including flip-flops, counters, and registers.

CO3 : Apply knowledge of digital logic to solve real-world engineering problems.

Module 1:

Binary Systems: Digital Computers and Digital Systems, Binary Numbers, Number Base Conversions, Octal and Hexadecimal Numbers, Complements, Signed Binary Numbers, Boolean Algebra and Logic Gates: Boolean functions, Logic Operators, digital Logic Gates, Simplification of Boolean functions: Two and Three Variable Maps, Four Variable Map, Five Variable Map, Product of Sums Simplification, NAND and NOR Implementation, Don't Care Conditions.

Module 2:

Combinational Logic: Design Procedure, Adders, Subtractors, Code Conversion, Analysis Procedure, Multilevel NAND Circuits, Multilevel NOR Circuits, Exclusive OR Functions, Binary Adder and Subtractor, Decimal Adder, Magnitude Comparator, Decoders and Encoders, Multiplexers, Programmable Logic Array (PLA), Programmable Array Logic (PAL).

Module 3:

Flip-Flops: RS Flip-Flop, D Flip-Flop, JK and T Flip-Flops, Triggering of Flip-Flops, Analysis of Clocked Sequential Circuits, State Reduction and Assignment, Design Procedure, Design of Counters, Registers, Shift Register, Ripple Counters, Synchronous Counters, Timing Sequences, Random-Access Memory (RAM)

Module 4:

Semiconductor RAM Memories: Internal Organization of Memory Chips, Static Memories, Dynamic RAMs, Read-only Memories: ROM, PROM, EPROM, EEPROM, Flash Memory, Direct Memory Access, Memory Hierarchy, Cache Memory, Virtual Memory, Secondary Storage: Magnetic Hard Disks, Optical Disks, Magnetic Tape Systems
Memory elements: SRAM, DRAM, ROM, Programmable logic arrays (PLAs) and field-programmable gate arrays (FPGAs), Introduction to hardware description languages (HDLs) such as Verilog or VHDL, Introduction to digital simulation tools

Text Books:

1. "Digital Design" by M. Morris Mano and Michael D. Ciletti
2. "Fundamentals of Digital Logic with Verilog Design" by Stephen Brown and Zvonko Vranesic
3. "Computer Organisation and Embedded Systems" by Carl Hamacher, Z Vranesic, S Zaky and N Manjikian

Reference Books:

1. "Digital Systems: Principles and Applications" by Ronald J. Tocci, Neal S. Widmer, and Greg Moss
2. "Introduction to Logic Design" by Alan B. Marcovitz

MCPC1002 COMPUTER NETWORKS (3-0-0)**Objective :**

1. Introduce students to the architecture, standards, and protocols of computer networks.
2. Provide an understanding of the functionalities of various network layers, including physical, data link, network, transport, and application layers.
3. Discuss the principles of routing, addressing, and internetworking in modern network environments.
4. Familiarize students with network applications, standard protocols, and techniques for ensuring quality of service and congestion control.

Module-I

Overview of the Internet: introduction to data communication, network application, Network hardware, Protocol, Layering Scenario, reference models: The OSI Model, TCP/IP model, Internet history, standards and administration; Comparison of the OSI and TCP/IP reference model. Physical Layer: data and signals: analog and digital, periodic analog signals, digital signals, transmission impairments, data rate limit, Guided transmission media, unguided transmission media, Wireless transmission, mobile telephone system.

Module-II

Data Link Layer: Design issues, error detection and correction design issues, elementary data link protocols, CRC codes, sliding window protocols, HDLC, the data link layer in the internet. Elementary Data Link Layer Protocols, sliding window protocols, noisy and noiseless channels.

THE MEDIUM ACCESS SUBLAYER: Channel allocations problem, multiple access protocols, Ethernet, Data Link Layer switching, Wireless LAN, Broadband Wireless, Bluetooth.

Module-III

Connecting devices: learning bridges, spanning tree bridges, repeaters, hubs, bridges, switches, routers and gateways, definition of multiplexing and types.

Network Layer: Network Layer Design issues, store and forward packet switching, connectionless and connection oriented networks-routing algorithms-optimality principle, circuit and packet switching, definition of flooding and multicast.

Module- IV

Routing protocols: Shortest Path, Routing uni-cast Distance Vector Routing, RIP, link state protocols, path vector routing. Internetworking: logical addressing, internet protocols, IP address, CIDR, IPv4 addressing, IPv6 Protocol addressing, addresses mapping, ICMP, IGMP, ARP, RARP, DHCP.

Module-V

Transport Protocols: process to process delivery, UDP, TCP, TCP Sliding Window, TCP Congestion Control, congestion control and quality of service.

Application Layer-World Wide Web, Standard client-server application-HTTP, FTP, electronic mail, TELNET, DNS.

Course Outcome :

Upon successful completion of this course, students will be able to:

1. Explain the architecture and functioning of different network layers and their associated protocols.
2. Compare the OSI and TCP/IP reference models and understand their application in real-world networks.
3. Implement and troubleshoot data link layer protocols and error detection/correction methods.
4. Design and manage network systems using appropriate hardware and software tools, including IP addressing and routing protocols.
5. Utilize and manage network applications and protocols such as HTTP, FTP, email, TELNET, and DNS effectively.

Text Books :

1. "Computer Networking: A Top-Down Approach" by James F. Kurose and Keith W. Ross.
2. "Data Communications and Networking" by Behrouz A. Forouzan.

References :

1. Computer networks by Tanenbaum, A.S., Pearson Education India.
2. Computer Networks by Bhushan Trivedi, Oxford University Press

MCPC1003 PROGRAMMING FOR PROBLEM SOLVING (3-0-0)

Course Objectives:

1. To provide an understanding of basic programming concepts using the C programming language.
2. To develop problem-solving skills using C programming constructs.
3. To introduce students to algorithmic thinking and program design techniques.
4. To enable students to write, compile, and debug programs in C.

Course Outcomes (CO):

- CO1: Understand the fundamental concepts of programming using the C language.
CO2: Develop problem-solving skills through the application of programming constructs in C.
CO3: Design and implement functions and algorithms to solve complex problems.
CO4: Demonstrate proficiency in using pointers, arrays, and structures in C programming.
CO5: Apply error handling and debugging techniques to identify and resolve programming errors.
CO6: Utilize file handling mechanisms in C for input/output operations.
CO7: Appreciate the importance of data structures and their implementation in C.

Module 1: Introduction to C Programming

Introduction to Problem Solving through programs, Flowcharts/Pseudo codes, the compilation process, Syntax and Semantic errors, Variables and Data Types , Arithmetic expressions, Relational Operations, Logical expressions; Conditional Branching and Iterative Loops.

Module 2: Functions and Arrays

Introduction to Functions, Function Prototypes and Declarations, Parameter Passing in Functions, Recursion, Arrays: 2-D arrays, Character Arrays and Strings.

Module 3: Pointers and Structures

Introduction to Pointers, Pointer Arithmetic, Dynamic Memory Allocation, Structures and Unions
File Handling in C, Self-Referential Structures and Introduction to Lists.

Module 4: Advanced Concepts in C

Preprocessor Directives, Command Line Arguments, Bitwise Operators, Error Handling and Debugging Techniques, Introduction to Data Structures in C.

Textbooks:

1. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill
2. E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill

Reference Books:

1. "C Programming: A Modern Approach" by K.N. King
2. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India
3. "Let Us C" by Yashavant Kanetkar
4. "Programming in C" by Stephen G. Kochan

MCPC1004 DATABASE MANAGEMENT SYSTEMS (3-0-0)**Course Objective:**

This course provides fundamental and practical knowledge on database concepts by means of organizing the information, storing and retrieve the information in an efficient and a flexible way from a well-structured relational model. This course ensures that every student will gain experience in creating data models and database design and be able to do the followings.

Focus the role of a database management system in an organization and construct ER Diagram.

Demonstrate basic database concepts, including the structure and operation of the relational data model and basic database queries using SQL.

Applying advanced database queries using Structured Query Language (SQL).

Evaluating logical database design principles and database normalization.

Demonstrate the concept of a database transaction, concurrency control, and data object locking and protocols.

Course Outcomes:

After successful completion of the course the student will be able to:

CO1: Understand database design principles.

CO2: Apply data Modelling using E-R diagrams.

CO3: Create refined data models using normalization.

CO4: Build database queries using Structured Query Language.

CO5: Understand the transaction management and concurrency control.

Module- 1

Introduction to DBMS: File system vs. DBMS, advantages of DBMS, storage data, queries, DBMS structure, Types of Databases – Hierarchical, Network, Relational, Key-Value, Object Oriented, XML DB Overview of File Structures in database, 3-schema architecture of DBMS, data independence, EF Codd Rule.

Module- 2

Data base Design: Data models, the importance of data models. E-R model: Entities, attributes and entity sets, relationship and relationship set, mapping cardinalities, keys, features of ER model, conceptual database design with ER model.

Relational model: Integrity constraints over relations and enforcement, querying relation data, logical database design, views, destroying/altering tables and views, Relational algebra, Extended relational algebra Operations.

Module- 3

Schema Refinement and Normal Forms: Introduction to Schema Refinement, Functional Dependencies, Reasoning about Functional Dependencies. Normal Forms, Properties of Decomposition, Normalization, different types of dependencies.

Module- 4

Basic SQL: Introduction to SQL, Basic SQL Queries: DML, DDL, DCL, and TCL

Structured Query Language (SQL): Select Commands, Union, Intersection, Except, Nested Queries, Aggregate Operators, Null values, Relational set operators, SQL join operators
Relational Algebra (RA): Selection, Projection, Set operations, joins

Relational Calculus (TRC, DRC): Tuple Relational Calculus, Domain Relational Calculus
PL/SQL, Assertions, Triggers. Introduction to Transaction Management: ACID properties, Transactions and Schedules, Concurrent Execution of Transactions, Lock-Based Concurrency Control. Concurrency Control: 2PL, Serializability and Recoverability, Introduction to Lock Management, Lock Conversions, Dealing with Deadlocks, Concurrency control without locking. Crash Recovery: Aries, Recovering from a System Crash.

Advanced Database: OODB, WEB based DB, Data warehousing and Data mining.

Textbooks:

1. H.F. Korth, A. Silverschatz, Abraham, " Database system concepts", Tata McGraw Hill Publication, 6e, 2011
2. Raghuram Ramakrishna and Johannes Gehrke, Database Management Systems, McGraw-Hill, 3e, 2014

References:

1. D. Ullman, Principles of Database and Knowledge – Base Systems, Vol. 1, 1/e, Computer Science Press, 1990.
2. Ramez Elmasri, Shamkant B. Navathe, Fundamentals of Database Systems, Pearson Education, 7e, 2016.
3. Er. Rajiv Chopra, "Database management systems, A Practical Approach", S. Chand Publishing

MCPC1201 COMPUTER NETWORKS LABORATORY (0-0-3)

Objective:

The Computer Networks Laboratory course aims to provide hands-on experience with the principles and practice of computer networks, focusing on both the theoretical and practical aspects of network design, implementation, and troubleshooting.

Course Outcomes:

By the end of the course, students will be able to:

1. Understand and implement various networking protocols.
2. Configure and troubleshoot network devices.
3. Analyze network performance.
4. Design and implement small-scale networks.

Laboratory Sessions:

1. Introduction to Network Lab Tools:
 - o Overview of network simulation tools like Cisco Packet Tracer, GNS3, Wireshark.
 - o Introduction to basic networking commands (ping, tracer, ipconfig/ifconfig).
2. Basic Network Configuration:
 - o Setting up a simple peer-to-peer network.
 - o Configuring IP addresses and subnet masks.
 - o Testing network connectivity using ping and tracer.
3. Error Detection and Correction:
 - o Implementing CRC error detection.
 - o Simulating error correction mechanisms.
4. Elementary Data Link Protocols:
 - o Simulation of sliding window protocols.
 - o Analysis of protocol performance over noisy and noiseless channels.
5. Medium Access Control:
 - o Configuring and analyzing Ethernet networks.
 - o Setting up and testing Wireless LAN (WLAN) connections.
 - o Exploring Bluetooth network configurations.
6. Network Devices Configuration:
 - o Setting up and configuring switches, routers, and gateways.
 - o Understanding the use of repeaters, hubs, and bridges in a network.
7. Multiplexing Techniques:
 - o Implementing and analyzing different types of multiplexing (TDM, FDM).
8. Routing Algorithms:
 - o Implementing and analyzing shortest path routing algorithms.
 - o Configuring Distance Vector Routing (RIP) and Link State Routing (OSPF).
9. IP Addressing and Subnetting:
 - o Configuring IPv4 and IPv6 addressing.
 - o Subnetting practice and exercises.
10. Address Mapping Protocols:
 - o Implementing and analyzing ARP, RARP, ICMP, IGMP.
 - o Configuring and testing DHCP.

11. Transport Layer Protocols:
 - o Simulation and analysis of TCP and UDP.
 - o Configuring TCP sliding window and congestion control mechanisms.
12. Quality of Service (QoS):
 - o Implementing and analyzing QoS in networks.
 - o Configuring QoS settings on network devices.
13. Application Layer Protocols:
 - o Setting up and testing HTTP, FTP, and DNS.
 - o Configuring and analyzing email protocols (SMTP, POP3, IMAP).
 - o Exploring TELNET and SSH for remote connectivity.

Reference Material:

- "Computer Networking: A Top-Down Approach" by James F. Kurose and Keith W. Ross.
- "Data Communications and Networking" by Behrouz A. Forouzan.
- Cisco Packet Tracer and GNS3 Documentation.

MCPC1202 C PROGRAMMING LAB (0-0-3)

List of Experiments:

1. Simple C programs.
2. Using If and switch constructs programs
3. Looping related problems
4. Programs using functions
5. If statement, If..else statement, nesting if else statement, else if ladder, switch statement, goto statement, while
6. statement, do statement, for statement
7. One-dimensional arrays, two dimensional arrays, multi dimensional arrays
8. Initialization of string variables, reading and writing strings, string handling functions
9. Programs using structures
10. Programs using unions
11. Initialization of pointer variables, address of variable, accessing a variable through its pointer
12. Pointer as Functions
13. Strings with Pointer: pointers and character strings, pointers and structures
14. Programs based on file handling
15. Command Line Arguments
16. Error Handling

MCPC1203 DATABASE MANAGEMENT SYSTEMS LAB (0-0-3)

List of Experiments:

1. Execute a single line and group functions for a table.
2. Execute DCL and TCL Commands.
3. Implement the query in SQL for a) insertion b) retrieval c) updating d) deletion.
4. Using Joins, Index, Key constraints and Normalization
5. Create views, partitions and locks for a particular DB
6. Write PL/SQL procedure for an application using exception handling
7. Write PL/SQL procedure for an application using cursors.

8. Write a DBMS program to prepare reports for an application using functions.
9. Write a PL/SQL block for transaction operations of a typical application using triggers.
10. Write a PL/SQL block for transaction operations of a typical application using package.
11. Design and develop an application using any front end and back end tool (make use of ER diagram and DFD).
12. Writing Assertion
13. Implementing operation on relation using PL/SQL
14. Creating Forms
15. Generating Reports

MCPC1005 OBJECT ORIENTED PROGRAMMING USING JAVA (3-0-0)

Course Objectives:

- To provide an understanding of basic programming concepts using the Java programming language.
- To develop problem-solving skills using Java programming constructs.
- To introduce students to algorithmic thinking and program design techniques and enable students to write, compile, and debug programs in Java.

Course Outcomes (CO):

- CO1: Understand the fundamental concepts of programming using the Java language.
- CO2: Develop problem-solving skills through the application of programming constructs in Java and design & implement functions and algorithms to solve complex problems.
- CO3: Demonstrate proficiency in using pointers, arrays, and structures in Java programming.
- CO4: Apply error handling and debugging techniques to identify and resolve programming errors.
- CO5: Utilize file handling mechanisms in Java for input/output operations and appreciate the importance of data structures and their implementation in Java.

Module-I

JAVA BASICS: Review of Object-oriented concepts, History of Java, Java buzzwords, JVM architecture, Data types, Variables, Scope and life time of variables, arrays, operators, control statements, type conversion and casting, simple java program, constructors, methods, Static block, Static Data, Static Method String and String Buffer Classes, Using Java API Document.

Module-II

INHERITANCE AND POLYMORPHISM: Basic concepts, Types of inheritance, Member access rules, Usage of this and Super key word, Method Overloading, Method overriding, Abstract classes, Dynamic method dispatch, Usage of final keyword. PACKAGES AND INTERFACES: Defining package, Access protection, importing packages, Defining and Implementing interfaces, and Extending interfaces. I / O STREAMS: Concepts of streams, Stream classes- Byte and Character stream, Reading console Input and Writing Console output, File Handling.

Module-III

EXCEPTION HANDLING: Exception types, Usage of Try, Catch, Throw, Throws and Finally keywords, Built-in Exceptions, Creating own Exception classes. MULTI THREADING: Concepts of Thread, Thread life cycle, creating threads using Thread class and Runnable interface, Synchronization, Thread priorities, Inter Thread communication. AWT CONTROLS: The AWT class hierarchy, user interface components- Labels, Button, Text Components, Check Box, Check Box Group, Choice, List Box, Panels – Scroll Pane, Menu, Scroll Bar. Working with Frame class, Colour, Fonts and layout managers.

Module-IV

EVENT HANDLING: Events, Event sources, Event Listeners, Event Delegation Model (EDM), Handling Mouse and Keyboard Events, Adapter classes, Inner classes. SWINGS: Introduction to Swings, Hierarchy of swing components. Containers, Top level containers -JFrame, JWindow, JDialog, JPanel, JButton, JToggleButton, JCheckBox, JRadioButton, JLabel, JPasswordField, JTextArea, JList, JComboBox, JScrollPane. APPLETS: Life cycle of an Applet, Differences between Applets and Applications, Developing applets, simple applet.

Books:

1. Herbert schildt (2010), The complete reference, 7th edition, Tata Mc graw Hill, New Delhi
2. Programming with Java, E. Balagurusamy, McGraw-Hill Education, 6th Edition.
3. Head First Java, O'rielly publications 2. T. Budd (2009), An Introduction to Object Oriented Programming, 3rd edition, Pearson Education, India.
4. J. Nino, F. A. Hosch (2002), An Introduction to programming and OO design using Java, John Wiley & sons, New Jersey.
5. Y. Daniel Liang (2010), Introduction to Java programming, 7th edition, Pearson education, India.

MCPC1006 SOFTWARE ENGINEERING (3-0-0)

Objectives:

- To provide the idea of decomposing the given problem into Analysis, Design, Implementation, Testing and Maintenance phases.
- To provide an idea of using various process models in the software industry according to given circumstances.
- To gain the knowledge of how Analysis, Design, Implementation, Testing and Maintenance processes are conducted in a software project.

Course Outcomes(CO):

- CO1: Students will be able to decompose the given project in various phases of a lifecycle.
- CO2: Students will be able to choose appropriate process model depending on the user requirements.
- CO3: Students will be able perform various life cycle activities like Analysis, Design, Implementation, Testing and Maintenance.
- CO4: Students will be able to know various processes used in all the phases of the product.
- CO5: Students can apply the knowledge, techniques and skills in the development of a software product.

Module-I

Introduction to Software Engineering: The evolving role of software, Changing Nature of Software. A Generic view of process: Software engineering- A layered technology, a process framework, Process patterns, process assessment, personal and team process models. Process models: The waterfall model, Incremental process models, Evolutionary process models, spiral, specialized process models, The Unified process.

Module-II

Requirement analysis: problems in information elicitation, methods of eliciting user requirements, functional and non-functional requirements, tools for requirement analysis, document flow charts, decision tables, data flow diagrams, data dictionaries, tools for analyzing real time systems, Use case diagrams, system sequence diagrams, CRC card, software requirement specification.

Software Requirements: Functional and non-functional requirements, User requirements, System requirements, the software requirements document. Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management, software requirement specification.

Module-III

Software design: The design process, Function-oriented design, Data base oriented design, Object oriented design, Data base design. Coding: Code documentation, data declaration, statement construction, guidelines for input/output, efficiency with regard to code, memory and input/output.

Module-IV

Testing: Unit testing, black box and white box testing, test cases, integration testing, top-down and bottom-up testing, validation testing, alpha and beta testing, system testing. Maintenance: software reliability, availability, and maintainability, Reliability models. Risk management: software risks, Risk identification, Risk projection, Risk refinement, Quality Management: Quality concepts, Software quality assurance, Software reliability, The ISO 9000 quality standards.

Books

1. Software Engineering: A Practitioners Approach by Roger Pressman, 6th Edition, McGraw-Hill
2. Software Engineering by Ian Sommerville, Addison-Wesley
3. Fundamentals of Software Engineering by Rajiv Mall, PHI

MCPC1007 DATA STRUCTURES (3-0-0)

Objectives:

- Course objectives reflect specific knowledge, skills, abilities, or competencies that instructors expect students to acquire from a particular course.
- Course objectives are often very specific and detailed statements that describe the content or skills that will be taught in the classroom.
- In some regards, course objectives can be thought of as inputs of student learning, representing the many important details that faculty members will cover during a particular course.

Course Outcomes(CO):

After successful completion of the course the student will be able to:

CO1: To understand the role and application of Data Structure in real life.

CO2: To develop abstract data types for solving the complex problems.

CO3: To understand the concepts of non-linear data structure and application.

CO4: To analyze the efficiency of algorithms.

CO5: To describe the concept of Graph Theory in detail.

Module-I

Fundamentals: Introduction to Data Structures, Classification of Data Structures, Algorithms, Measuring Space and Time Complexities, Asymptotic Notations, Abstract Data Types.

Arrays: Storage Structures for Arrays, Sparse Matrixes, Strings, Pattern Matching.

Linked Lists: Dynamic Memory Management, Single Linked Lists, Double Linked Lists, Circular Linked Lists, Operations on Polynomials.

Stacks and Queues: Representation, Linked Stacks and Queues, Operations on Stacks and Queues, Applications of Stack and Queues.

Module-II

Trees: Terminology, Representation, Binary Trees, Binary Search Trees, Searching, Insertion and Deletions Operations in a Binary Search Tree, Height Balanced Trees, M-way Search Trees, B-Trees, B+ Trees, General Trees, Representation of General Trees and Binary Trees, Forests, Application of Trees.

Module-III

Graphs: Terminology, Representation, Path Matrix, Graph Traversal, Shortest Path Problems, Topological Sort.

Searching and Sorting Techniques: Linear and Binary Search, Bubble Sort, Insertion Sort, Selection Sort, Quick Sort, Merge Sort, Heap and Heap Sort, Radix Sort, Comparison of Sorting Techniques.

Module-IV

Hashing: Hash Functions and Hashing Techniques. External sorting, Implementation using programming in C.

Books:

1. Data Structures Using C - Aaron M. Tenenbaum
2. Tremblay, Jean-Paul, and Paul G. Sorenson, "An introduction to data structures with applications", McGraw-Hill, Inc., 1984.
3. Ellis Horowitz, SartajSahni, Susan Anderson-Freed, "Fundamentals of Data Structures in C", Second Edition, 2008, Universities Press Pvt. Ltd. Hyderabad.
4. Seymour, Lipchitz. "Data Structures with C."TMH (2010).

MCPC1008 COMPUTER ORGANIZATION AND ARCHITECTURE (3-0-0)

Objectives:

- To obtain the basic architectural and organizational concepts of a digital computer.
- To analyze performance issues in processor and memory design of a digital computer.
- To understand processor performance improvement using instruction level parallelism.

Course Outcomes(CO):

After successful completion of the course the student will be able to:

- CO1: Understand background of internal communication of computer and have better idea on how to write assembly language programs.
- CO2: Be clear with memory management techniques.
- CO3: Understand the communication IO devices with processor.
- CO4: Notice how to perform computer arithmetic operations.
- CO5: Be clear with pipeline procedure and multi processors.

Module-I

Introduction: Review of basic computer architecture, Quantitative techniques in computer design, measuring and reporting performance.

Module-II

Pipelining : Basic concepts, Instruction and Arithmetic pipeline, Data hazards, Control hazards and Structural hazards, Techniques for handling hazards. Exception handling. Pipeline optimization techniques.

Module-III

Hierarchical memory technology: Inclusion, Coherence and locality properties, Cache memory organizations, Techniques for reducing cache misses; Virtual memory organization, Mapping and Management techniques, Memory replacement policies. Instruction-level Parallelism: Basic concepts, Techniques for increasing ILP, Superscalar, Superpipelined and VLIW Processor architectures. Array and Vector processors.

Module-IV

Multiprocessor architecture: Taxonomy of Parallel Architectures, Centralized shared-memory architecture, Synchronization, Memory consistency, Interconnection networks. Distributed shared memory architecture. Cluster computers.

Books:

1. Morris Mano, "Computer System Architecture", PHI
2. William Stallings, "Computer Organization and Architecture - Designing for Performance", Sixth Edition, Pearson Education, 2003
3. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, "Computer Organization", Fifth Edition, Tata McGraw Hill, 2002.
4. Patterson, "Computer Organisation and Design", Elsevier
5. John P Hayes, "Computer Organization", McGraw Hill

MCPC1009 THEORY OF COMPUTATION (3-0-0)

Objectives:

1. Apply theory of computation concepts to solve problems in computer science
2. Understand the fundamental concepts of automata theory, formal languages, and computation models
3. Analyze and design finite automata
4. Understand the basics of Theory of Computation, design and minimize finite automata
5. Study the properties of regular languages, context-free languages
6. Analyze and design pushdown automata, understand context-free grammars
7. Understand Turing machines, analyze undecidable problems and recursively enumerable languages
8. Analyze complexity, understand formal language properties

Course Outcomes(CO):

Upon successful completion of this course, the student shall be able to:

- CO1: Apply finite automata concepts to solve problems and describe the types of grammar and derivation tree
- CO2: Analyze a given Finite Automata machine and find out its Language and apply pushdown automata and context-free grammar concepts to solve problems
- CO3: Apply Turing machine concepts to solve problems
- CO4: Apply complexity theory and formal language property concepts to solve problems
- CO5: Develop a computational model using Turing machine for the given problem. ·
Examine the complexity for P and NP completeness for the given problem.

Module-I

Introduction to Theory of Computation, Finite Automata (FA): Deterministic FA (DFA) and Nondeterministic FA (NFA), Finite Automata with Epsilon-Transition.

Module-II

Regular expressions, Finite automata and Regular expressions, Applications of regular expressions, Algebraic laws of regular expressions, Pumping Lemma and its application for regular languages, Closure and Decision properties of regular languages.

Module-III

Context-Free Grammars, Parse trees, Ambiguity in Grammar & Languages, Pushdown automation. The language of PDA. Equivalence of PDA's and CFG's. Deterministic pushdown automata, Chomsky Normal form, the pumping Lemma for context free languages, Decision properties of CFL's.

Module-IV

The Turing machine, Programming techniques for Turing machines, Extension to the basic Turing machine, Restricted Turing machine, Turing machines and computers. Non-Recursively enumerable languages, Undecidable problem that in recursively enumerable, Undecidable problem about Turing machines, Post's correspondence problem, other undecidable problems.

Books:

1. Introduction to Automata Theory, Languages and Computation- J.Hopcroft, R.Motwani ,J.D.Ullman- Pearson Education

Reference Books:

1. Introduction to Theory of Computation- M.Siper, Thomson Learning
2. P.Linz,“ An Introduction to formal Languages and Automata”,Norasa,2000
3. Lewish Papadimitra: Theory of Computations, Prentice Hall of India, New Delhi.

MCHS1002 UNIVERSAL HUMAN VALUES & PROFESSIONAL ETHICS (2-0-0)

Objectives:

This course is intended to:

1. To assist students in recognizing the fundamental interdependence between 'VALUES' and 'SKILLS' in achieving enduring happiness and prosperity, which are the primary objectives of all individuals.
2. To promote the cultivation of a holistic perspective among students regarding life, profession, happiness, and prosperity, grounded in an accurate comprehension of human reality and the broader existence. This comprehensive viewpoint underpins Universal Human Values and the transition towards a naturally value-oriented existence.
3. To emphasize the potential consequences of a holistic understanding regarding ethical human behavior, trustworthy and mutually satisfying interactions among individuals, and meaningful relationships with Nature.
4. This course aims to offer essential guidance in value education to inquisitive youth.

Course Outcomes (CO)

- CO1 At the end of the course, students are expected to become more aware of themselves, and their surroundings (family, society, nature);
- CO2 They would develop greater responsibility in life and in addressing issues with sustainable solutions, while considering human relationships and human nature.
- CO3 They would possess enhanced critical faculties.
- CO4 They would also develop sensitivity to their dedication to their understanding of human values, relationships, and society.
- CO5 It is anticipated that they will apply their acquired knowledge to various real-life situations, marking a preliminary step in this direction.

Module-I

Introduction to Value Education

Right Understanding, Relationship and Physical Facility (Holistic Development and the Role of Education) Understanding Value Education, Self-exploration as the Process for Value Education, Continuous Happiness and Prosperity – the Basic Human Aspirations, Happiness and Prosperity – Current Scenario, Method to Fulfil the Basic Human Aspirations

Module-II

Harmony in the Human Being :

Understanding Human being as the Co-existence of the Self and the Body, Distinguishing between the Needs of the Self and the Body, The Body as an Instrument of the Self,

Understanding Harmony in the Self, Harmony of the Self with the Body, Programme to ensure self-regulation and Health

Module-III

Harmony in the Family and Society: Harmony in the Family – the Basic Unit of Human Interaction, 'Trust' – the Foundational Value in Relationship, 'Respect' – as the Right Evaluation, Other Feelings, Justice in Human-to- Human Relationship, Understanding Harmony in the Society, Vision for the Universal Human Order

Module-IV

Harmony in the Nature/Existence :

Understanding Harmony in the Nature, Interconnectedness, self-regulation and Mutual Fulfilment among the Four Orders of Nature, Realizing Existence as Co-existence at All Levels, The Holistic Perception of Harmony in Existence.

Module-V

Implications of the Holistic Understanding – a Look at Professional Ethics : Natural Acceptance of Human Values, Definitiveness of (Ethical) Human Conduct, A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order, Competence in Professional Ethics Holistic Technologies, Production Systems and Management Models- Typical Case Studies, Strategies for Transition towards Value-based Life and Profession

Books:

- The Textbook A Foundation Course in Human Values and Professional Ethics, R R Gaur, R Asthana, G P Bagaria, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978- 93-87034- 47-1
- The Teacher's Manual for A Foundation Course in Human Values and Professional Ethics, R R Gaur, R Asthana, G

Reference Books

- Jeevan Vidya: Ek Parichaya, A Nagaraj, Jeevan Vidya Prakashan, Amar kantik, 1999.
- Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.

MCPC1204 OBJECT ORIENTED PROGRAMMING LAB (0-0-3)

List of Programs:

1. Write a program in Java to find the set of prime numbers from 1 to 100.
2. Write a program to compare two objects. Create two objects representing two complex number and find the larger one.
3. Write a Java Program to convert a Number to Word.
4. Write a Java Program to copy all elements of one array into another array
5. Write a Java Program to sort the elements of an array in ascending order
6. Write a Java Program to find the frequency of odd & even numbers in the given matrix
7. Write a Java Program to determine whether a given string is palindrome
8. Write a Java program to draw a pattern such as

	000*000*
2 4	0*00*00*0
3 6 9	00*0*0*00
4 8 12 16	000***000

9. Write a Java program to convert Decimal to Binary in Java

10. Write a program to add two times given in hour minutes and seconds using class and object.
11. Write a Java program to find the combination $c(n,r)$ by inheriting from a class that computes the factorial of a number.
12. Write a Java program to find the area of different geometrical shapes using polymorphism.
13. Write a Java program to create a user defined package that finds the largest among an array of n numbers. Use this package to sort an array of n numbers using insertion/selection sort.
14. Create three threads and print 1 to 10 in each thread.
15. Write a Java program to illustrate the concept of some exceptions such as divide by zero or array index out of bound etc.

MCPC1205 SOFTWARE ENGINEERING LAB (0-0-3)

List of Experiments:

1. Identifying the Requirements from Problem Statements.
Requirements, Characteristics of Requirements, Categorization of Requirements, Functional Requirements, Identifying Functional Requirements
2. Estimation of Project Metrics
Project Estimation Techniques, COCOMO, Basic COCOMO Model, Intermediate COCOMO Model, Complete COCOMO Model, Advantages of COCOMO, Drawbacks of COCOMO, Halstead's Complexity Metrics
3. Modeling UML Use Case Diagrams and Capturing Use Case Scenarios
Use case diagrams, Actor, Use Case, Subject, Graphical Representation, Association between Actors and Use Cases, Use Case Relationships, Include Relationship, Extend Relationship, Generalization Relationship, Identifying Actors, Identifying Use cases, Guidelines for drawing Use Case diagrams
4. E-R Modeling from the Problem Statements
Entity Relationship Model, Entity Set and Relationship Set, Attributes of Entity, Keys, Weak Entity, Entity Generalization and Specialization, Mapping Cardinalities, ER Diagram, Graphical Notations for ER Diagram, Importance of ER modeling
5. Identifying Domain Classes from the Problem Statements
Domain Class, Traditional Techniques for Identification of Classes, Grammatical Approach Using Nouns, Advantages, Disadvantages, Using Generalization, Using Subclasses, Steps to Identify Domain Classes from Problem Statement, Advanced Concepts
6. Statechart and Activity Modeling
Statechart Diagrams, Building Blocks of a Statechart Diagram, State, Transition, Action, Guidelines for drawing Statechart Diagrams, Activity Diagrams, Components of an Activity Diagram, Activity, Flow, Decision, Merge, Fork, Join, Note, Partition, Guidelines for drawing an Activity Diagram
7. Modeling UML Class Diagrams and Sequence diagrams
Structural and Behavioral aspects, Class diagram, Elements in class diagram, Class, Relationships, Sequence diagram, Elements in sequence diagram, Object, Life-line bar, Messages
8. Modeling Data Flow Diagrams
Data Flow Diagram, Graphical notations for Data Flow Diagram, Explanation of Symbols used in DFD, Context diagram and leveling DFD
9. Estimation of Test Coverage Metrics and Structural Complexity

Control Flow Graph, Terminologies, McCabe's Cyclomatic Complexity, Computing Cyclomatic Complexity, Optimum Value of Cyclomatic Complexity, Merits, Demerits

10. Designing Test Suites
Software Testing, Standards for Software Test Documentation, Testing Frameworks, Need for Software Testing, Test Cases and Test Suite, Types of Software Testing, Unit Testing, Integration Testing and System Testing.

MCPC1206 DATA STRUCTURE LAB (0-0-3)

List of experiments:

- 1 Implementation of Stack Using Array.
- 2 Implementation of Queue Using Array.
- 3 Implementation of Infix to Postfix Conversion using Stack.
- 4 Evaluation of Postfix Expression using Stack.
- 5 Implementation of the following operations on Single linked list:
i) Creation ii) Insertion iii) Deletion iv) Traversal in both ways
- 6 Implementation of the following operations on Double linked list:
i) Creation ii) Insertion iii) Deletion
- 7 Implementation of Stack Using Linked List.
- 8 Implementation of Queue Using Linked List.
- 9 Implementation of the following operations on Binary Tree:
i) Creation ii) Insertion iii) Deletion.
- 10 Implementation of Binary Tree Traversal : Preorder, Inorder and Postorder.
- 11 Implementation of Binary Search Tree.
- 12 Implementation of sorting algorithms : Bubble Sort, Selection Sort, Insertion Sort, Quick Sort, Merge Sort and Heap sort.
- 13 Implementation of Searching Algorithms : Linear Search and Binary Search
- 14 Implementation of Breadth First Search (BFS) in a Graph.
- 15 Implementation of Depth First Search (DFS) in a Graph.
- 16 Implementation of Hashing using hash functions

MCPC1207 PROGRAMMING IN PYTHON LAB (0-0-3)

List of Programs:

1. Write a Program to read and print values of variables of different data types.
2. Write a program to perform addition, subtraction, multiplication, division and modulo division on two integers.
3. Write a program to input two numbers and check whether they are equal or not.
4. Write a program that prompts user to enter a character (O, A, B, C, F). Then using if-elseif-else construct display Outstanding, Very Good, Good, Average and Fail respectively.
5. Write a program to print Fibonacci series using recursion.
6. Write a program that prints absolute value, square root and cube root of a number. (import math package).
7. Write a program that finds the greatest of three given numbers using functions. Pass three arguments.
8. Write a program to get a string made of the first 2 and last 2 characters from a given string. If the string length is less than 2, return empty string.
9. Write a program that fetches data from a specified url and writes it in a file.