

**SVKM's NarseeMonjee Institute of Management Studies**  
**Mukesh Patel School of Technology Management & Engineering**

<b>Program: B.Tech. (IT)</b>				<b>Semester : IV</b>	
<b>Course/Module : Engineering Mathematics - IV</b>				<b>Module Code:BTIT04008</b>	
<b>Teaching Scheme</b>				<b>Evaluation Scheme</b>	
<b>Lecture (Hours per week)</b>	<b>Practical (Hours per week)</b>	<b>Tutorial (Hours per week)</b>	<b>Credit</b>	<b>Internal Continuous Assessment (ICA) (Marks - 50)</b>	<b>Term End Examinations (TEE) (Marks- 100 in Question Paper)</b>
3	0	1	4	Marks Scaled to 50	Marks Scaled to 50
<b>Pre-requisite:</b> Basic proving techniques, concepts in number theory, Algebra, pre-calculus.					
<b>Objectives:</b>					
<ol style="list-style-type: none"> <li>1. To provide knowledge of formal logic, sets, relations and functions.</li> <li>2. To impart knowledge of algebraic structures and its use in coding theory.</li> </ol>					
<b>Outcomes:</b>					
After completion of the course, students would be able to :					
<ol style="list-style-type: none"> <li>1. Explain the basic concepts of logical operations.</li> <li>2. Solve problems using the foundations of Set and Graph theory.</li> <li>3. Demonstrate understanding of Algebraic Structures and their application in coding theory.</li> <li>4. Discuss different methods of generating function and recurrence relation.</li> </ol>					
<b>Detailed Syllabus:</b>					
<b>Unit</b>	<b>Description</b>				<b>Duration</b>
<b>1</b>	<b>Set Theory:</b> Sets, Venn diagrams, Operations on sets, Laws of set theory, Partitions of sets, Power set, The principle of Inclusion-Exclusion.				<b>03</b>
<b>2</b>	<b>Logic:</b> Propositions and logical operations, Truth tables, Equivalence, Implications, Laws of logic, Disjunctive and Conjunctive Normal Forms, Predicates and Quantifiers, Mathematical Induction.				<b>04</b>
<b>3</b>	<b>Relations, Posets and Lattice:</b> Relations, Representation of Relation, Operations on relation, Properties and types of binary relations, closures of relation and				<b>12</b>

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	Warshall's algorithm, Equivalence and Partial ordered relations, Posets and Hasse diagram, Extremal elements, Lattices.	
<b>4</b>	<b>Functions and Pigeon Hole Principle:</b> Definition and types of functions: injective, surjective and bijective functions, Composition, identity and inverse, Pigeon-hole principle and extended pigeon-hole principle.	<b>04</b>
<b>5</b>	<b>Graphs and Trees:</b> Graphs and their properties, Degree, Connectivity, Path, Cycle, Sub Graph, Isomorphism, Eulerian graph, Hamiltonian graph, Planar graphs, Graph Coloring, Isomorphism of graphs. Trees, Rooted tree and path length in rooted trees, Spanning tree and minimum spanning tree, Kruskal's and Prim's algorithms for minimal spanning trees.	<b>08</b>
<b>6</b>	<b>Groups:</b> Algebraic structures with one binary operation: Monoids, Semi groups, Groups; Product of algebraic structures, Isomorphism, Homomorphism, Automorphism of groups, Subgroup, Normal subgroup, Quotient group, Codes and group codes.	<b>10</b>
<b>7</b>	<b>Generating Functions and Recurrence Relations:</b> Series and Sequences, Generating functions, Recurrence relations, Solving Linear Homogeneous Recurrence Relations with constant coefficients.	<b>04</b>
	<b>Total</b>	<b>45</b>

**Text Books:**

1. Seymour Lipschutz and Marc Lars Lipson, "Discrete Mathematics", McGrawHill, Revised 3<sup>rd</sup> Edition, 2017
2. C.L.Liu and D.P. Mohapatra, "Elements of Discrete Mathematics", McGraw-Hill, 4<sup>th</sup> Edition, 2012.

**Reference Books:**

1. Kolman, Busby, Ross, "Discrete Mathematical Structures", PHI, 6<sup>th</sup> edition, 2015
2. Kenneth H. Rosen, "Discrete Mathematics and its Applications", McGraw-Hill, 7<sup>th</sup> Edition, 2012.

**Details of Internal Continuous Assessment (ICA)**

**Test Marks :20**

**Term Work Marks : 30**

**Details of Term work: As per Institute Norms.**

Signature

(Prepared by Concerned Faculty/HOD)

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<b>Program:</b> B. Tech. Information Technology				<b>Semester : IV</b>	
<b>Course/Module :</b> Operating Systems				<b>Module Code:</b> BTIT04104	
<b>Teaching Scheme</b>				<b>Evaluation Scheme</b>	
<b>Lecture (Hours per week)</b>	<b>Practical( Hours per week)</b>	<b>Tutorial(H ours per week)</b>	<b>Credit</b>	<b>Internal Continuous Assessment (ICA) (Marks - 50)</b>	<b>Term End Examinations (TEE) (Marks- 100 in Question Paper)</b>
3	2	0	4	Marks Scaled to 50	Marks Scaled to 50
<b>Pre-requisite:</b> Computer Organization & Architecture, Programming for Problem Solving					
<b>Objectives:</b>					
<ul style="list-style-type: none"> <li>• Student will learn important resources and their management policies, algorithms used by operating system. This fundamental will help them to study and design modern operating systems in subsequent trimester and would work as a base to understanding advances OS subjects like Distributed Systems, Embedded Systems etc.</li> <li>• Understand problem solving through banker's algorithm, paging algorithms, process &amp; disk scheduling algorithms, File Allocation Methods, Free Space Disk Management Algorithms.</li> <li>• Make the students understand the basics of IPC concepts like critical section, starvation, semaphore, monitor, messages, deadlock through real life problems like Sleeping Barber, Consumer &amp; Producer, Readers &amp; Writers, Dining Philosophers.</li> </ul>					
<b>Outcomes:</b>					
After completion of the course, students would be able to :					
<ul style="list-style-type: none"> <li>• Understand the objectives, services and different architectures of the Operating System and their types.</li> <li>• Understand and conduct simulation experiments on process scheduling, inter-process communication, deadlock avoidance of system by using different algorithms.</li> <li>• Implement and evaluate the various memory management techniques provided by the OS to improve the overall system performance.</li> </ul> <p>Understand the techniques to manage files &amp; methods to access different storage devices.</p>					
<b>Detailed Syllabus:</b>					
<b>Unit</b>	<b>Description</b>				<b>Duration</b>
<b>1</b>	<b>Introduction:</b> Concept of Operating Systems, Generations of Operating systems, Types of Operating Systems, OS Services, System Calls, Structure of an OS - Layered, Monolithic, Microkernel Operating Systems, Concept of Virtual Machine. Case study on UNIX and WINDOWS Operating System.				<b>5</b>
<b>2</b>	<b>Processes:</b> Definition, Process Relationship, Different states of a Process, Process State transitions, Process Control Block (PCB), Context switching				<b>8</b>

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	<p><b>Thread:</b> Definition, Various states, Benefits of threads, Types of threads, Concept of multithreads,</p> <p><b>Process Scheduling:</b> Foundation and Scheduling objectives, Types of Schedulers, Scheduling criteria: CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time; Scheduling algorithms: Pre-emptive and Non pre-emptive, FCFS, SJF and RR</p>	
<b>3</b>	<p><b>Inter-process Communication:</b> Critical Section, Race Conditions, Mutual Exclusion, Hardware Solution, Strict Alternation, Peterson's Solution, The Producer\ Consumer Problem, Semaphores, Event Counters, Monitors, Message Passing, Classical IPC Problems: Reader's &amp; Writer Problem, Dining Philosopher Problem.</p>	<b>8</b>
<b>4</b>	<p><b>Deadlocks:</b> Definition, Necessary and sufficient conditions for Deadlock, Deadlock Prevention, Deadlock Avoidance: Banker's algorithm, Deadlock detection and Recovery.</p>	<b>8</b>
<b>5</b>	<p><b>Memory Management:</b> Basic concept, Logical and Physical address map, Memory allocation: Contiguous Memory allocation – Fixed and variable partition– Internal and External fragmentation and Compaction; Paging: Principle of operation – Page allocation – Hardware support for paging, Protection and sharing, Disadvantages of paging.</p> <p><b>Virtual Memory:</b> Basics of Virtual Memory – Hardware and control structures – Locality of reference, Page fault , Working Set , Dirty page/Dirty bit – Demand paging, Page Replacement algorithms: Optimal, First in First Out (FIFO), Second Chance (SC), Not recently used (NRU) and Least Recently used (LRU).</p>	<b>8</b>
<b>6</b>	<p><b>I/O Hardware:</b> I/O devices, Device controllers, Direct memory access Principles of I/O Software: Goals of Interrupt handlers, Device drivers, Device independent I/O software, Secondary-Storage Structure: Disk structure, Disk scheduling algorithms</p> <p><b>File Management:</b> Concept of File, Access methods, File types, File operation, Directory structure, File System structure, Allocation methods (contiguous, linked, indexed), Free-space management (bit vector, linked list, grouping), directory implementation (linear list, hash table), efficiency and performance.</p> <p><b>Disk Management:</b> Disk structure, Disk scheduling - FCFS, SSTF, SCAN, C-SCAN</p>	<b>8</b>
	<b>Total</b>	<b>45</b>

**Text Books:**

1. AchyutGodbole, "Operating Systems", McGraw-Hill, 3<sup>rd</sup> Edition, 2010

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2. William Stallings, "Operating Systems: Internals and Design Principles", 9<sup>th</sup> Edition, Pearson, 2018.

**Reference Books:**

1. Abraham Silberschatz, Peter B. Galvin and Greg Gagne, "Operating System Concepts", 8<sup>th</sup> Edition, Wiley, 2009.
2. Ann McHoes, "Understanding Operating Systems", 5<sup>th</sup> Edition, Course Technology, 2007
3. Andrew Tannenbaum, Woodhull Albert, "Operating Systems : Design and Implementation", 2<sup>nd</sup> Edition, PHI, 2002R.

**Any other information :**

**Details of Internal Continuous Assessment (ICA)**

**Test Marks : 20**

**Term Work Marks : 30**

**Details of Term work : Lab work/Quiz/Assignment/Presentation/Viva**

Signature  
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**Mukesh Patel School of Technology Management & Engineering**

<b>Program:</b> B. Tech. (Information Technology)				<b>Semester : IV</b>	
<b>Course/Module :</b> Computer Networks				<b>Module Code:</b> BTIT04009	
<b>Teaching Scheme</b>				<b>Evaluation Scheme</b>	
<b>Lecture (Hours per week)</b>	<b>Practical (Hours per week)</b>	<b>Tutorial (Hours per week)</b>	<b>Credit</b>	<b>Internal Continuous Assessment (ICA) (Marks - 50 )</b>	<b>Term End Examinations (TEE) (Marks- 100 in Question Paper)</b>
3	2	-	4	Marks Scaled to 50	Marks Scaled to 50
<b>Prerequisite:</b> Programming for Problem Solving					
<b>Objectives:</b> This is an introductory course in computer networks. The course is designed to enable students to understand and analyze the protocols, and applications, of computer networks. The objective is to learn how computer networks work today and the basics of its architecture.					
<b>Outcomes:</b> <b>After completion of this course, students will be able to</b>					
<ol style="list-style-type: none"> <li>1. Describe the function of different network models, associated protocols and standards</li> <li>2. Compare different transmission media, and understand error detection and correction techniques</li> <li>3. Analyze medium access control algorithms, and network layer error control, flow control, and routing algorithms</li> <li>4. Understand transport layer congestion control techniques, application layer protocols and basic security concepts</li> </ol>					
<b>Detailed Syllabus:</b>					
<b>Unit</b>	<b>Description</b>				<b>Duration</b>
1	<b>Introduction:</b> Introduction to computer networks, classification of computer networks, topology, layering and protocol, OSI reference model. TCP/IP model, networking devices, performance issues (bandwidth, latency, delay etc.).				3
2	<b>Application Layer:</b> DNS, E-mail (working of email transfer and delivery), WWW (Architectural overview)				6
3	<b>Transport Layer:</b> Transport layer services, elements of transport layer, UDP and TCP				6
4	<b>Network layer:</b> Forwarding and routing, virtual circuit and datagram networks, router internals, routing algorithms - (optimality principle, shortest path routing, flooding, distance vector routing, link state routing, hierarchical, broadcast, multicast )				8

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5	<b>Medium access control sub layer:</b> Channel allocation problem, random access protocol (ALOHA, Carrier Sense Multiple Access (CSMA), Carrier Sense Multiple Access Collision Detection – (CSMA/CD), controlled access (reservation, polling, token passing), channelization (FDMA, TDMA, CDMA), Ethernet (Binary exponential backoff, switched Ethernet, fast Ethernet, Gigabit Ethernet)	7
6	<b>Data Link Layer:</b> Data link layer design issues (services provided to network layer, framing, error control and flow control), error detection and correction techniques (parity checks, check summing methods, CRC, Hamming code), reliable transmission (stop and wait, sliding window protocol with its variants)	6
7	<b>Physical Layer and media:</b> Analog and digital signals, transmission impairment, data rate limits, guided media and unguided media.	5
8	<b>Network Security:</b> Cryptography- introduction, substitution ciphers, transposition ciphers, one time pads, symmetric key algorithm, and public key algorithm.	4
	<b>Total</b>	<b>45</b>

**Text Books:**

1. Behrouz A Forouzan, Firouz Mosharrar, “Computer Networks: A Top Down Approach”, TMH, 2012.
2. Behrouz A. Forouzan, “Data Communications and Networking”, 5<sup>th</sup> edition, McGraw-Hill, 2013.

**Reference Books:**

1. James F. Kurose, Keith W. Ross, “Computer Networking: A Top Down Approach”, 6<sup>th</sup> edition, Pearson Education, 2012.
2. Larry L. Peterson, Bruce S. Davie, “Computer Networks: A systems approach”, 5<sup>th</sup> edition, Morgan Kaufmann Publishers, 2011.
3. Andrew S. Tanenbaum, David Wetherall, “Computer Networks”, 5<sup>th</sup> edition, Pearson Education, 2012.
4. Nader F Mir, “Computer and Communication Networks”, Pearson Education, 2009.
5. Bhushan Trivedi, “Computer Networks”, Oxford University Press, 2011.

**Any other information :****Details of Internal Continuous Assessment (ICA)**

Test Marks :30

Term Work Marks : 20

Details of Term work : Tutorials/Quiz/Presentation/Viva

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<b>Program:</b> B. Tech. (Information Technology)				<b>Semester : IV</b>	
<b>Course/Module :</b> Computer Organization & Architecture				<b>Module Code:</b> BTIT04102	
<b>Teaching Scheme</b>				<b>Evaluation Scheme</b>	
<b>Lecture (Hours per week)</b>	<b>Practical (Hours per week)</b>	<b>Tutorial (Hours per week)</b>	<b>Credit</b>	<b>Internal Continuous Assessment (ICA) (Marks - 50 )</b>	<b>Term End Examinations (TEE) (Marks- 100 in Question Paper)</b>
2	0	1	3	Marks Scaled to 50	Marks Scaled to 50
<b>Pre-requisite:</b> Digital Logic Design					
<b>Objectives:</b> <ul style="list-style-type: none"> <li>• To have a thorough understanding of the basic structure and operation of a digital computer.</li> <li>• To discuss in detail the operation of the arithmetic unit including the algorithms &amp; implementation of fixed-point and floating-point addition, subtraction, multiplication &amp; division.</li> <li>• To study the different ways of communicating with I/O devices and standard I/O interfaces. To study the hierarchical memory system including cache memories and virtual memory.</li> </ul>					
<b>Outcomes:</b> After completion of the course, students would be able to : <ul style="list-style-type: none"> <li>• Understand the fundamental concepts of Computer Organization and Architecture</li> <li>• Understand the operations of Bus &amp; Memory.</li> <li>• Understand the operations of Central Processing Unit</li> <li>• Understand the working of Control Unit, I/O and parallel processing</li> </ul>					
<b>Detailed Syllabus:</b>					
<b>Unit</b>	<b>Description</b>				<b>Duration</b>
1	<b>Introduction:</b> Basic organization of computers, Block level description of the functional units as related to the execution of a program, Fetch, decode and execute cycle.				4
2	<b>Central processing unit:</b> Machine instructions, Instruction set architectures, Assembly language programming, addressing modes, instruction cycles, registers and storage, addressing modes; discussions about RISC versus CISC architectures; Inside a CPU				4
3	<b>Data path design:</b> Information representation, Floating point representation (IEEE 754), computer arithmetic and their implementation; Fixed-Point Arithmetic: Addition, Subtraction, Multiplication and Division, Arithmetic Logic Units control and data path, data path components, design of ALU and data path, controller design; Hardwired and Micro-programmed Control				6
4	<b>Memory Organization:</b> Memory Technology, static and dynamic memory, Random Access and Serial Access Memories, Cache memory and Memory Hierarchy, Address Mapping, Cache updation schemes, Virtual memory and memory management unit.				6



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5	<b>Input and output unit:</b> I/O subsystems: Input-Output devices such as Disk, CD-ROM, Printer etc.; Interfacing with IO devices, keyboard and display interfaces; Basic concepts Bus Control, Read Write operations, Programmed IO, Concept of handshaking, Polled and Interrupt-driven I/O, DMA data transfer;	6
6	<b>Multiprocessor organization:</b> Pipeline Processing, Instruction and Arithmetic Pipeline, Pipeline hazards and their resolution, Parallel Processing	4
	<b>Total</b>	<b>30</b>

**Text Books:**

1. William Stallings, "Computer Organization and Architecture: Designing for Performance", 9th Edition, Pearson Education, 2013.

**Reference Books:**

1. John P. Hayes, "Computer Architecture and Organization", 3<sup>rd</sup> Edition, Tata Mc-Graw Hill, 2012.
2. Andrew Tannenbaum, Todd Austin, "Structured Computer Organization", 6th Edition, Prentice-Hall, 2013.
3. V. Carl Hamacher and Zaky, "Computer Organization", 5<sup>th</sup> Edition, Tata Mc-Graw Hill, 2011.

**Any other information :**

**Details of Internal Continuous Assessment (ICA)**

**Test Marks :30**

**Term Work Marks : 20**

**Details of Term work : Tutorials/Quiz/Presentation/Viva**

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<b>Program:</b> B. Tech. (Information Technology)				<b>Semester :IV</b>	
<b>Course/Module :</b> Object Oriented Programming				<b>Module Code:BTIT04010</b>	
<b>Teaching Scheme</b>				<b>Evaluation Scheme</b>	
<b>Lecture (Hours per week)</b>	<b>Practical (Hours per week)</b>	<b>Tutorial (Hours per week)</b>	<b>Credit</b>	<b>Internal Continuous Assessment (ICA) (Marks - 50)</b>	<b>Term End Examinations (TEE)</b>
1	4	0	3	Marks Scaled to 50	-
<b>Pre-requisite:</b> Programming for Problem Solving ()					
<b>Objectives:</b> The main objective of the course is to : <ul style="list-style-type: none"> <li>• Gain enough competence in object-oriented programming to tackle a complete OO project.</li> <li>• Addresses the main principles of good OO design, what major tasks are appropriate to developing OO models and software, the issues and options to reuse and component based development.</li> <li>• Use of a version control system, an automated build process, an appropriate framework for automated unit and integration tests.</li> </ul>					
<b>Outcomes:</b> After completion of the course, students would be able to : <ol style="list-style-type: none"> <li>1. Understand Generic types, collection objects and create abstract (data types, interface and class) types and implement them in projects.</li> <li>2. Apply the OO concepts data hiding, encapsulation, inheritance, hierarchy, polymorphism and modularity.</li> <li>3. Learn to use version control tools, an automated build process, appropriate frameworks for development and automated unit and integration testing the system.</li> <li>4. Name and apply some common Design patterns used in the development of a robust system.</li> </ol>					
<b>Detailed Syllabus:</b>					
<b>Unit</b>	<b>Description</b>				<b>Duration</b>
1.	<b>Object Orientation:</b> Review of Object Orientation, Class and Objects, Primitive Object types, Vectors, Input/ Output handling, Exceptions - Exception types, Throwing Exceptions.				2
2.	<b>Data Abstraction.</b> Specifications for data abstraction, Using data abstraction, Implementing data abstraction, Abstract data types and their specification, Abstract Class, Interface, Procedural Abstraction, Designing Procedural Abstractions, Lists, Collections, Iteration abstraction -				3

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	Specifying Iterators, implementing iterators	
3.	<b>Features of Object Oriented Programming.</b> Data Hiding, Encapsulation, object identity, Polymorphism. Inheritance, Defining a Type Hierarchy, Organizing classes into inheritance hierarchies.	2
4.	<b>Modelling Classes.</b> UML Class Diagram, Associations and multiplicity, Generalization. Process of developing class diagrams, Implementing class diagrams in Object Oriented Programming Language.	2
5.	<b>Testing</b> Black Box, White Box Testing Procedures, Testing Iterators, Testing Data Abstraction, Testing Polymorphic Abstractions. Testing a Type Hierarchy, Unit and Integration Testing, Tools for Testing, Debugging, Version Control, Frameworks	2
6.	<b>Design Patterns</b> GOF Patterns, Singleton, Abstraction–Occurrence, General Hierarchy, MVC Pattern, The iterator pattern, Player–Role, Observer, Delegation, Adapter, Façade, Immutable, Read-Only Interface, Proxy, Factory pattern	4
	<b>Total</b>	<b>15</b>

**Text Books:**

1. Barbara Liskov, Program Development in Java, Addison-Wesley, 2001
2. Y. Daniel Liang, "INTRODUCTION TO JAVA PROGRAMMING COMPREHENSIVE VERSION", 10th Edition, Pearson Education.
3. Timothy C. Lethbridge, Robert Laganier "Object-Oriented Software Engineering - A practical software development using UML and Java", Tata McGraw-Hill, New Delhi.

**Reference Books:**

1. Mike O'Docherty "Object-Oriented Analysis & design - understanding system development with UML 2.0", John Wiley
2. Erich Gamma, Richard Helm, "Design Patterns (Elements of Reusable Object Oriented Software)", Pearson, 2nd Edition, 1994.

**Any other information :**

**Details of Internal Continuous Assessment (ICA)**

**Test Marks : 20**

**Term Work Marks : 30**

**Details of Term work : Tutorials/Quiz/Presentation/Viva**

Signature

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<b>Program: B.Tech.(IT)</b>				<b>Semester : IV</b>	
<b>Course : Principles of Economics and Management</b>				<b>Module Code: BTIT04011</b>	
<b>Teaching Scheme</b>				<b>Evaluation Scheme</b>	
<b>Lecture (Hours per week)</b>	<b>Practical (Hours per week)</b>	<b>Tutorial (Hours per week)</b>	<b>Credit</b>	<b>Internal Continuous Assessment (ICA) (Marks - 50)</b>	<b>Term End Examinations (TEE) (Marks- 100 in Question Paper)</b>
3	---	---	3	Marks Scaled to 50	Marks Scaled to 50
<b>Pre-requisite: Nil</b>					
<b>Objectives:</b> This course provides basic orientation towards economic(micro and macroeconomic) principles and help them understand the functions of management <ul style="list-style-type: none"> <li>• To combine elements of basic micro and macroeconomics.</li> <li>• To understand issues dealing with small-scale economic phenomena and concepts such as prices and output of firms, industries and resource owners.</li> <li>• To examine market impact of technological change.</li> <li>• To understand broader aspects of the economy and its environment.</li> </ul>					
<b>Outcomes:</b> After completion of the course, students would be able to : <ul style="list-style-type: none"> <li>• Analyse and evaluate the impact of Economic Policies and its implication on the Business Environment</li> <li>• Understand basic concepts of economics (demand, supply, elasticity, scarcity) and explain behaviour on individual, households and firm.</li> <li>• Handle economic data and write economic report</li> <li>• Orient students towards basic management principles and act as foundation for higher levels of learning</li> <li>• To be able to handle basic functions of management (planning, organising, coordination, and control)</li> </ul>					
<b>Detailed Syllabus: (per session plan)</b>					
<b>Unit</b>	<b>Description</b>				<b>Duration</b>
1	Introduction: Definition of Economics, Types of economic systems, problem of scarcity of economic resources.				2
2	Demand and Supply: Demand Curve and Supply Curve, Equilibrium of Demand and Supply, Shift in Demand and Supply. Application of Demand and Supply: Price Elasticity of Demand, Price Elasticity of Supply, Factors which influence Elasticity, Elasticity and Revenue.				3
3	Market Structure /industry analysis types of Competition: monopoly, oligopoly, monopolistic competition, perfect and imperfect competition,				3

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	government policies towards industries. Circular flow of Economy, Structures, Role of Government, Business Cycles.	
4	Macroeconomics : National Income - Gross Domestic Product (GDP), Gross National Product (GNP), Inflation - Cost Push and Demand Pull Inflation, Unemployment, Philips Curve	3
5	Functions of Central Bank Money supply, RBI & Monetary Policy.(Current Credit Policy to be critiqued) Stabilization policy : Role of fiscal Policy Demand and Consumer Behavior: Utility and Marginal Utility, Types of Goods	3
6	New economic policy :Liberalization, privatization and globalization	3
7	Theory of Production : Law of Diminishing Returns, Returns to Scale, Productivity	3
8	Analysis of Costs: Types of Costs - Total Cost, Fixed Cost, Variable Cost, Marginal Cost, Impact of Marginal Cost on Average Cost.	3
9	Introduction to Management: Management & Organizations, Management History, Understanding Management thought ,contribution of F.W. Taylor, Henry Fayol, Elton -Mayo Contexts- Constraints & Challenges	5
10	Planning: Managers as Decision makers, Foundations of Planning, Strategic Management	4
11	Organizing: Line and staff relationships ,centralization and decentralization , role of delegation ,Managing Human Resources, Managing Teams	4
12	Leading and Motivation: Basic concepts and practices -Maslows Herzberg McClelland 's theory of Achievement	4
13	Controlling: Introduction to Controlling inventory, quality control.	3
14	Orientation towards Finance, Marketing Human resources and Operation departments	2
	<b>Total</b>	<b>45</b>

**Text Books:**

1. Samuelson and Nordhaus, (2010), *Economics - 19<sup>th</sup> edition*, Tata McGraw Hil Publication.
2. Datt and Sundharam, (2009), *Indian Economy - 67<sup>th</sup> edition*, S. Chand Publication.
3. Koontz. H. (2012). *Essentials of Management: International and Leadership Perspective*. McGraw Hill Education (India).
4. Collins, J. (2001). *Good to Great: Why Some Companies Makes the Leap and Other's Don't*. Random House Business Books.

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**Reference Books:**

1. Mankiw Gregory, (2008), *Principles of Economics*, Cengage Learning
2. Rakesh Singh, (2007), *Analyzing Macro-Economics*, Shroff Publishers

**Any other information :**

**Details of Internal Continuous Assessment (ICA)**

**Test Marks : 30**

**Term Work Marks : 20**

**Details of Term work :Class Test/ Assignment/Case Studies/Projects/ Presentations**

Signature  
(Prepared by Concerned Faculty/HOD)

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<b>Program:</b> B. Tech. (IT)				<b>Semester :</b> IV	
<b>Course:</b> Environmental Studies				<b>Code:</b> BTIT04012	
<b>Teaching Scheme</b>				<b>Evaluation Scheme</b>	
<b>Lecture (Hours per week)</b>	<b>Practical (Hours per week)</b>	<b>Tutorial (Hours per week)</b>	<b>Credit</b>	<b>Internal Continuous Assessment (ICA) (Marks - 50)</b>	<b>Term End Examinations (TEE) (Marks- -- in Question Paper)</b>
2	0	0	0	Marks Scaled to 50	--
<b>Pre-requisite:</b> Chemistry, Physics					
<b>Objectives:</b>					
<ol style="list-style-type: none"> <li>1. Introduce – Environment, Environmental Pollution,</li> <li>2. Acquaint with Social Issues and methods to manage them</li> <li>3. Improving Planning of activities</li> </ol>					
<b>Outcomes:</b>					
After completion of the course, students would be able to:					
<ol style="list-style-type: none"> <li>1. Discuss Types of Environmental Pollution, Natural resources and its misuse, Importance of Environmental management for Construction Projects</li> <li>2. Prepare plan for water management, promotion of recycle and reuse, generation of less waste, avoiding electricity waste</li> <li>3. Prepare Slogan, Poster and plan activities for environmental protection and social issues</li> </ol>					
<b>Detailed Syllabus: (per session plan)</b>					
<b>Unit</b>	<b>Description</b>				<b>Duration</b>
1	Introduction to Environment and its components: Natural Resources and it Misuse leading to Environmental degradation. Role of Ecology in Environmental Degradation and Protection. Major industrial and other environmental disasters Environmental pollution- Types, Causes, Effects, Reduction methodology.				08
2	Introduction to waste generation, Methods to Reduce, Reuse and Recycle of Waste Importance of 3R's, Promotion of 3R's - Methods Solid wastes, Industrial Waste, Bio-Medical Waste and Hazardous waste management – Types, Storage, Transportation, Treatment Disposal. C&D and E-waste – Concept, methods for reduction, management Campaigning for waste reduction and management.				08
3	Concept of EIA and SIA, significance, methodology, report drafting. Environmental Management System, ISO 14000 EMS certification				05
4	Environmental Protection, Social Issues, Disaster Management Social Issues and Environment International Conventions, Summits and Protocols Generation of less waste and avoiding electricity waste. Environmental management for construction Projects				05
5	Role of the Government in managing the environmental activities in all sectors. Organisational set up at the Central and state level to manage the environment. Role of judiciary in managing the environment. Role of Citizens, Role of NGOs/ Environmental Activists.				04

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	Major Laws Air (P&C.P.) Act, Water (P & C.P) Act. Environment Protection Act EPA 1986. Wild life Protection Act etc., PIL	
	<b>Total</b>	<b>30</b>
<b>Text Books:</b>		
1. Benny Joseph (2017), "Environmental Studies", <i>The McGraw-Hill Companies</i>		
2. Gerard Kiely (2007), "Environmental Engineering", <i>Tata McGraw-Hill Education</i>		
<b>Reference Books:</b>		
1. P. Arne Vesilind, Susan M. Morgan (2004), "Introduction to Environmental Engineering", <i>Thomas/Brook/Cole</i> .		
2. Mackenzie Davis, David Cornwell (2017), "Introduction to Environmental Engineering", <i>McGraw-Hill Companies</i> .		
<b>Any other information: NIL</b>		
<b>Details of Internal Continuous Assessment (ICA):</b>		
<b>Test Marks: 20</b>		
<b>Term Work Marks: 30</b>		
<b>Details of Term work:</b>		
Term work should consist of the following:		
1. Minimum five assignment on the above syllabus		
2. Report on Social Issues		
3. Report on Environmental Management Case Study		

Signature  
(Prepared by Concerned Faculty/HOD)