Department of Computer Applications

2 YEARS MCA PROGRAMME

Document Release Month & Year: August, 2020

PART I
COURSE STRUCTURE

BRIDGE COURSE

A. Theory							
Sl.	**Code**	**Subject**	**Contacts Periods/Week**				**Credit Points**
			L	**T**	**P**	**Total**	
1	MCAP0001	Introduction to Programming	6	0	0	6	0
2	MCAP0002	Digital Logic and Computer Organization	6	0	0	6	0
3	MCAP0003	Fundamentals of Database Systems	6	0	0	6	0
Total Theory						**18**	**0**
B. Laboratory							
4	MCAP0011	Programming Lab	0	0	8	8	0
5	MCAP0012	Digital Logic Lab	0	0	8	8	0
Total Practical						**16**	**0**
Total of Semester						**34**	**0**

Bridge course will be of three weeks duration, to be offered prior to the commencement of 1st semester classes.

FIRST YEAR

FIRST SEMESTER

A. Theory							
Sl.	**Code**	**Subject**	**Contacts Periods/Week**				**Credit Points**
			L	**T**	**P**	**Total**	
1	MCAP1101	Object Oriented Programming with Java	3	1	0	4	4
2	MCAP1102	Programming with Python	3	1	0	4	4
3	MCAP1103	Artificial Intelligence	3	0	0	3	3
4	MATH1102	Mathematical Foundations	3	0	0	3	3
5	HMTS1102	Oral and Written Communication	3	0	0	3	3
		Total Theory				**17**	**17**
B. Laboratory							
6	MCAP1111	Java Programming Lab	0	0	4	4	3
7	MCAP1112	Python Programming Lab	0	0	4	4	3
8	HMTS1112	Communication Lab	0	0	4	4	3
		Total Practical				**12**	**9**
		Total of Semester				**29**	**26**

SECOND SEMESTER

A. Theory							
Sl.	**Code**	**Subject**	**Contacts Periods/Week**				**Credit Points**
			L	**T**	**P**	**Total**	
1	MCAP1201	Data Structures and Algorithms	3	1	0	4	4
2	MCAP1202	Computer Communication Networks	3	1	0	4	4
3	MCAP1203	Soft Computing	3	0	0	3	3
4	MCAP1204	Operating Systems	3	0	0	3	3
5	MCAP1205	Information System Analysis and Design	3	0	0	3	3
		Total Theory				**17**	**17**
B. Laboratory							
6	MCAP1211	Data Structures and Algorithms Lab	0	0	4	4	3
7	MCAP1212	Computer Network Lab	0	0	4	4	3
		Total Practical				**8**	**6**
C. Sessional							
8	HMTS1221	Career Development and Management	0	0	3	3	2
		Total Sessional				**3**	**2**
		Total of Semester				**28**	**25**

SECOND YEAR

THIRD SEMESTER

A. Theory							
Sl.	**Code**	**Subject**	**Contacts Periods/Week**				**Credit Points**
			L	**T**	**P**	**Total**	
1	MCAP2101	Database Management Systems	3	1	0	4	4
2	MCAP2102	Web Technology	3	1	0	4	4
3	MATH2103	Optimization Techniques	3	0	0	3	3
4	MCAP2150-MCAP2153	Elective I	3	0	0	3	3
	MCAP2150 MCAP2151 MCAP2152 MCAP2153	Machine Learning Mobile Computing Ecommerce and ERP Cloud Computing					
5	MCAP2160-MCAP2162, HMTS2163	Elective II	3	0	0	3	3
	MCAP2160 MCAP2161 MCAP2162 HMTS2163	Cryptography and Network Security Compiler Design Natural Language Processing Managerial Economics					
		Total Theory				**17**	**17**
B. Laboratory							
6	MCAP2111	DBMS Lab	0	0	4	4	3
7	MCAP2112	Web Technology Lab	0	0	4	4	3
		Total Practical				**8**	**6**
C. Sessional							
8	MCAP2195	Minor Project and Seminar	0	0	4	4	3
		Total Sessional				**4**	**3**
		Total of Semester				**29**	**26**

FOURTH SEMESTER

A. Theory							
Sl.	**Code**	**Subject**	**Contacts Periods/Week**				**Credit Points**
			L	**T**	**P**	**Total**	
1	MCAP2201	Software Engineering	3	1	0	4	4
2	MCAP2202	Mobile Application Development and Implementation	3	0	0	3	3
3	MCAP2250-MCAP2254	Elective III	3	0	0	3	3
	MCAP2250 MCAP2251 MCAP2252 MCAP2253 MCAP2254	Advanced Database Management Data Mining & Knowledge Discovery Secure Software Design and Enterprise Computing Internet of Things Blockchain Technology & Applications					
4	MCAP2260-MCAP2263 MATH2264	Elective IV	3	0	0	3	3
	MCAP2260 MCAP2261 MCAP2262 MCAP2263 MATH2264	Image Processing Computer Graphics and Multimedia Data Science Software Project Management Foundations of Decision Processes					
		Total Theory				**13**	**13**
B. Laboratory							
5	MCAP2211	Software Engineering Lab	0	0	4	4	3
		Total Practical				**4**	**3**
C. Sessional							
6	MCAP2295	Major Project and Seminar	0	0	12	12	9
		Total Sessional				**12**	**9**
		Total of Semester				**29**	**25**

PART II
1ST YEAR DETAILED SYLLABUS

BRIDGE COURSE

Paper Name: INTRODUCTION TO PROGRAMMING					
Paper Code: MCAP0001					
Contact hrs per week:	**L**	**T**	**P**	**Total**	**Credit Point**
	6	**0**	**0**	**6**	**0**

Problem Solving Method: Algorithm, Flowchart, Problem-Solving Methodology- Tools, Pseudocode.

[1L]

Overview of C language: C Standards, Structure of a C Program, C Libraries and Steps of Compilation of a C Program.

[1L]

Expressions: Basic Data Types, Variables, Type Qualifiers, Storage Class Specifiers, Variable Scopes, Constants, Operators, Operator Precedence, Expression Evaluation, Type Conversion in Expressions, Type Casting.

[2L]

Console I/O: Reading and Writing Characters, Reading and Writing Strings, Formatted Console I/O.

[1L]

Control Statements: Selection Statements (if, switch-case), Iteration Statements (for loop, while loop, do-while loop), Jumping Statements (return, goto, break, exit, continue).

[3L]

Function: Functions and Modular Programming, General Form, Function Prototypes, Library Functions, Parameter Passing Mechanisms, Storage Classes, Recursive function.

[3L]

Arrays and Strings: Single Dimension Arrays, Two Dimension Arrays, Multidimensional Arrays, Strings, Arrays of Strings, String Library Functions.

[3L]

Pointer: Pointers and Memory Addressing. Pointer Variables, Pointer Arithmetic, Pointer Expressions, Pointers and Arrays, Functions and Pointers, Dynamic Memory Allocation, Command Line Arguments.

[4L]

Text Books:

1. Programming with C - Gottfried, TMH.
2. Programming in C - Balagurusamy, Tata McGraw Hill.
3. Programming in C – Reema Thareja, Oxford University Press.

Reference Books:

1. C Programming Made Easy - Raja Ram, SCITECH.
2. The C Programming Language - Kernighan Ritchie, PHI.

Paper Name: DIGITAL LOGIC AND COMPUTER ORGANIZATION					
Paper Code : MCAP0002					
Contact hrs per week	**L**	**T**	**P**	**Total**	**Credit Point**
	6	**0**	**0**	**6**	**0**

Boolean Algebra and Logic Gates: Logic gates- truth tables and circuits; Representation in SOP and POS forms; Minimization of logic expressions by algebraic method, K-map method.

[2L]

Combinational Circuits: Adder and Subtractor circuits and its applications, Adder-Subtractor Composite circuit. Circuits of Encoder, Decoder, Multiplexer, De-Multiplexer and Parity Generator.

[6L]

Sequential Circuits: Basic memory element - S-R, J-K, D and T flip flops, Master-Slave flip flop. Registers and working functionalities of different shift registers.

[4L]

Basic Computer Organization: Introduction to basic structures and operational concepts, Instruction formats, Instruction execution, sequencing, Addressing modes – concepts, fetching and storing word from/in main memory.

[2L]

Memory: Memory – Basic concepts, RAM, ROM – different types. Cache memory- Performance (memory interleaving, mapping functions hit rate etc.), Memory hierarchy. DMA.

[3L]

Pipelining: Pipelining concepts, vector processing, Hazards of pipelining.

[1L]

Text Books:

1. Digital Logic and Computer Design - M. Morris Mano, Pearson.
2. Computer System Architecture - Morris Mano, PHI.
3. Digital Logic Design –MansafAlam, Bashir Alam, PHI.

Reference Books:

1. Computer Organization – C. Hamacher, Z. Vranesik, S. Zaky, McGraw Hill.
2. Computer Architecture and Organization – John P. Hayes, McGraw Hill.
3. Digital Design: Basic Concepts and Principles - Mohammad A. Karim, CRC Press.

Paper Name: FUNDAMENTALS OF DATABASE SYSTEMS					
Paper Code : MCAP0003					
Contact hrs per week	**L**	**T**	**P**	**Total**	**Credit Point**
	6	**0**	**0**	**6**	**0**

Concepts &Overview of Database System: Introduction to Data, Knowledge, Database. Data Processing vs. Data Management Systems. File Oriented Approach, Limitation of file-based approach over Database System. Database Oriented Approach to Data Management. Introduction to DBMS, Characteristics of DBMS, Advantages and Disadvantages of a DBMS. DBMS architecture.

[4L]

Data Models: Overview of Data Models, Traditional models, Data abstraction through three-level architecture, hierarchical model, network model and relational model, ER Models.

[2L]

Database Administrator, Database Users: Database administration, Privilege and Role of DBA, administration roles, Database Users.

[2L]

Database Languages: Instance and schema, Data dictionary, Data independence, Concept of DDL, DML, DCL, Overview of Database Languages.

[2L]

Relational Model: Overview of relational databases -Structure of relational databases, Domains, Relations. Definitions and properties, keys, Integrity rules.

[5L]

Types of Database System: Relational Database, Object Oriented Database, Object relational Database, Temporal Database, Grid Database, Mobile Database, Green Database, Cloud Database.

[3L]

Text Books:

1. Data Base System Concepts, Silverchatz, Korth & Sudarshan, MH.
2. Data Base Management Systems, Majumder & Bhattacharyya, TMH
3. Data Base Management System, A.K. Pujari, ISTE/EXCEL

Reference Books:

1. Fundamentals of Data Base Mgmt. System, Vig & Walia, ISTE/EXCEL
2. Data Base Management Systems, Leon, VIKAS
3. Data Base Management Systems, V.K Jain, Wiley Dreamtech

Paper Name: PROGRAMMING LAB					
Paper Code: MCAP0001					
Contact hrs per week:	**L**	**T**	**P**	**Total**	**Credit Point**
	0	**0**	**8**	**8**	**0**

Software to be used: GNU C Compiler (GCC) with LINUX
NB: Cygwin (Windows based) may be used in place of LINUX

Problems related to the following topics:

1. LINUX commands and LINUX based editors.
2. Basic Problem Solving and Control Structures.
3. Array (1-d, 2-d).
4. Functions.
5. Dynamic Memory Allocation.
6. String Handling.

Paper Name: DIGITAL LOGIC LAB					
Paper Code : MCAP0012					
Contact hrs per week	**L**	**T**	**P**	**Total**	**Credit Point**
	0	**0**	**8**	**8**	**0**

Problems related to the following topics:

1. Realization of Basic Logic gates.
2. Half adder, Full adder.
3. Adder-subtractor Composite circuit.
4. Implementation of Boolean Function using 2:1 MUX and 4:1 MUX.
5. Realization of SR and D flip flop using NAND gates.
6. Realization of JK and T flip flop using NAND gates.

Syllabus of 1st Semester

Paper Name: OBJECT ORIENTED PROGRAMMING WITH JAVA					
Paper Code: MCAP1101					
Contact hrs per week:	**L**	**T**	**P**	**Total**	**Credit Point**
	3	**1**	**0**	**4**	**4**

Course Outcomes:

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

1. Understand the OOPs concepts.
2. Solve real world problems using OOP techniques.
3. Understand the principles of inheritance and polymorphism; and demonstrate how they relate to the design of abstract classes.
4. Understand the use of packages and interface.
5. Develop and understand exception handling, multithreaded applications with synchronization.
6. Understand the use of collection framework

Module I - [10L]

Introduction to Object Oriented Programming

Genesis of Object Oriented Programming. Problems with Procedural Programming, Object Oriented Concepts – Objects & Classes, Abstraction, Encapsulation, Message Passing, Access Specifier, Relationships, Aggregation, Links & Associations, Generalization & Specialization, Inheritance, Abstract Classes, Meta-Class, Grouping Constructs. Comparison of Procedural & OOP.

Introduction to Java

Introduction and Overview, Virtual machines - concept and hierarchy of virtual machines. Basic Language Constructs, Arrays. String Class, String Methods, String Arrays, Command Line Arguments, StringBuffer Class, StringBuffer Methods.

Module II - [10L]

Classes and Objects

Defining a Class, Creating Objects, Assigning Object Reference Variables, Introducing Methods, Array of Objects, Constructors, Method Overloading, Passing and Returning Objects, "this" Keyword, Static Members, Introducing Access Control, Inner and Nested Classes.

Inheritance

Inheritance and Code Reusability, Types of Inheritance, Dealing with "super", Multilevel Inheritance, Method Overriding, "final" Keyword, Object Class, Abstract Classes.

Module III - [10L]

Interface

Defining Interfaces, Implementing Interfaces, Extending Interfaces, Interfaces and Multiple Inheritance.

Package
Using Packages, Java API, User Defined Packages, Classpath, Access Control.

Exception Handling
Exception and Exception Handling, Exception Types, Built-in Exceptions, "throw", "throws", "finally", Creating User Defined Exceptions, Chained and Unchained Exceptions.

Module IV - [10L]

Multithreading
Multitasking & Multithreading, Java and Multithreading, Creating Threads, Life Cycle of a Thread, Thread Methods, Thread Priorities, Synchronization and Deadlock.

Excerpts from java.util and java.lang
Wrapper Classes, Runtime Class, System Class, Object Cloning, Garbage Collection, String Tokenizer, Collections API.

Advanced Topics
Enumerations, Autoboxing, Annotations, Generics, Lambda Expressions.

Text Books:
1. JAVA: The Complete Reference – Herbert Schildt, TMH.
2. Core Java I and II – Horstmann and Cornell, Oracle Corporation.

Reference Books:
1. Object Oriented Modeling & Design, James R. Rum Baugh, PHI.
2. The Java Programming Language – James Gosling, Addison Wesley.
3. Java – How to Program – Deitel and Deitel, PHI.

A Programmer's Guide to Java SCJP Certification - Khalid A. Mughal and Rolf W. Rasmussen, Addison Wesley.

Paper Name: PROGRAMMING WITH PYTHON					
Paper Code: MCAP1102					
Contact hrs per week:	**L**	**T**	**P**	**Total**	**Credit Point**
	3	**1**	**0**	**4**	**4**

Course Outcomes:

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

1. Understand and comprehend the concept of python programming.
2. Apply knowledge in real life applications.
3. Understand the concept of object-oriented programming.
4. Create application using data using concept of file.
5. Use standards program constructs.
6. Understand and apply python library in mathematical problem solving.

Module I [10L]

Introduction: What is Python? Why Python? Installing Python, Python Syntax, Comments, Writing a program using Python.

Expression: Variables and Values, Built-in Data Types, Numeric data type and Type Casting, Boolean Expression Evaluation, String - String Literals, String Assignment, Multiline Strings,Slicing, Negative Indexing, Check String, String Concatenation, String Format, Escape Character, String Methods; Operators, Expression Evaluation.

Console I/O: Printing Information, User Input.

Collections: Lists, Tuple, Set, Dictionary.

Module II [10L]

Control Statement: Statements Execution, Conditions and If Statements, Indentation, If-Else Statements, Nested If Statements, Short Hand If and If-Else, pass Statement, While Loop, For Loop, Nesting Loops, Controlling Loops using Break and Continue, Else Statement, Range Statement and Pass Statement in Loop.

Functions: Creating a Function, Calling a Function, Arguments, Arbitrary Arguments, Arbitrary Keyword Arguments, Default Parameter Value, List as an Argument, Return Values, pass Statement, Recursive Function, Lambda Function.

Module III [10L]

Classes and Objects: Create a Class, Create Object, __Init__() Function, Methods, Self Parameter, Modification and Deletion of Object Parameter, Deletion of Object, Pass Statement,
Inheritance and Polymorphism, Iterator, Scope, Module, Built-In Math Function, Math Module, Module datetime and Date Objects, RegEx Module and RegEx Functions, Exception Handling.

Module IV [10L]

File Handling: Kinds of Files, Creating Files, Opening Files, Reading Files, Writing Files, Delete

Files and Folder, Simple APIs.

Python Library:
NumPy - Installation of NumPy, Import NumPy, NumPy Creating Arrays, Array Indexing, Array Slicing, Data Types, Copy vs View, Array Shape and Reshape, Array Iterating, Splitting and Joining Array, Sorting Arrays, Filtering Arrays, Random Numbers, Universal Functions (ufuncs), Mean, Median, Mode, Standard Deviation, Percentiles, Random Data Distributions.
matplotlib - Scatter Plot, Histogram.

Text Books:

1. Python: The Complete Reference, Martin C. Brown,McGraw-Hill Education
2. Python for Everybody: Exploring Data in Python 3, Charles Russell Severance, Sue Blumenberg, CreateSpace Independent

Reference Books:

1. Let Us Python, YashavantKanetkar, BPB
2. Practical Programming: An Introduction to Computer Science Using Python 3.6, Paul Gries, Jennifer Campbell, Jason Montojo, SPD
3. Python Programming: An Introduction to Computer Science, John M. Zelle, Franklin, Beedle & Associates
4. Learning with Python: How to think like a Computer Scientist, Allen Downey, Jeffrey Elkner, Chris Meyers, Dreamtech press
5. Learning Python, Mark Lutz, O'Reilly

Paper Name: ARTIFICIAL INTELLIGENCE					
Paper Code:MCAP1103					
Contact hrs per week:	**L**	**T**	**P**	**Total**	**Credit Point**
	3	**0**	**0**	**3**	**3**

Course Outcomes:

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

1. Understand the historical perspective of human endeavor to know about the nature of intelligence and the related mathematical models.
2. Understand the role of intelligent agents to solve various real time problems.
3. Understand different forms of learning models.
4. Understand knowledge representation using mathematical logic.
5. Analyze the working principle of an expert system.
6. Analyze uncertainty using non-monotonic reasoning, probabilistic reasoning, and use of certainty factors.

Module I – [10L]

Introduction
Introduction to AI - definition of AI, typical AI problems, practical impact of AI, approaches to AI, limits of AI today, AI history.

Intelligent Agents
Definitions of a rational agent, reflex, model-based, goal-based, and utility-based agents, agent environment.

Problem Solving using Search (Single agent)
Categorization of Search as Blind and Heuristic. Concepts of State space search.

Module II – [10L]

Problem Solving using Search (Multi agents)
Adversarial Search, Game Tree and Alpha-Beta pruning.

Constraint satisfaction problems (CSP)
Representation of CSP, solution of CSP, Various Types.

Knowledge Representation and Logic (Propositional Logic)
Knowledge representation and reasoning, inference, rules of inference, using inference rules to prove a Query/Goal/Theorem, soundness and completeness.

Module III – [10L]

Knowledge Representation and Logic (First Order Logic)
First Order Logic, unification, semantics, soundness, completeness, consistency, satisfiability; Inference in First Order Logic – resolution, proof as search, proof strategies, non-monotonic reasoning.

Knowledge Representation and Logic (Rule based Systems)
Rule Based Systems, Horn Clause Logic, Backward Chaining, Forward chaining, Various

Knowledge representation formalisms, Expert systems.

Module IV – [10L]

Planning
Introduction to planning, logic based planning, planning systems - representation of states and goals, representation of action.

Reasoning with Uncertainty (Probabilistic reasoning)
Reasoning with uncertain information- Probabilistic reasoning, review of probability theory; Probabilistic inference rules; Bayesian Networks - semantics of Bayesian networks, learning of Bayesian Network parameters, inferencing in Bayesian Networks.

Text Books:
1. Artificial Intelligence - A Modern Approach,S. Russell and P. Norvig, Pearson Education.
2. Introduction to Artificial Intelligence and Expert Systems - Dan W. Patterson, PHI.

Reference Books:
1. Artificial Intelligence and Soft Computing Behavioral and Cognitive Modeling of the Human Brain - Amit Konar, CRC Press.
2. Artificial Intelligence - Elaine Rich and Kelvin Knight, TMH.

Paper Name: MATHEMATICAL FOUNDATIONS					
Paper Code: MATH1102					
Contact hrs per week:	**L**	**T**	**P**	**Total**	**Credit Point**
	3	**0**	**0**	**3**	**3**

Course Outcomes:

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

1. Understand the mathematical fundamentals which are prerequisites for a variety of courses like data mining, computer security, software engineering, operating systems, machine learning etc..
2. Analyzeprobabilitydistributionsrequiredtoquantifyphenomenonwhose true value is uncertain.
3. Interpret the problems that can be formulated in terms of graphs and trees.
4. Demonstrate the knowledge of probabilistic approaches to solve wide range of engineering problem.
5. Employ statistical methods to make inferences on results obtained from an experiment.
6. Develop the understanding of the mathematical and logical basis to many modern techniques like machine learning, programming language design, and concurrency.

Module I: [10L]

Graph Theory: Graph, Digraph, Weighted graph, Connected and disconnected graphs, Complement of a graph, Regular graph, Complete graph, Sub-graph, Walk, Path, Circuit, Euler Graph, Hamiltonian Graph, Cut sets and cut vertices, Matrix representation of a graph, Adjacencyandincidencematricesofagraph,Graphisomorphism,Bipartitegraph.Definition and properties of a Tree, Binary tree and its properties, Spanning tree.

Module II: [10L]

Probability and Statistics I: Basic Probability: Sample Space, Events, Classical Definition, Addition and Multiplication Rule, Conditional Probability. Axiomatic definition of Probability and related problems. Bayes' Theorem and related problems. Random variables, single variable discrete and continuous distributions, Expectation and Variance.

Module III: [10L]

Probability and Statistics II: Special Distributions: Binomial and Normal Distribution. Moment generating and Characteristic functions. Measures of Central Tendency: Mean, Median, Mode. Measures of Dispersion. Covariance and Correlation Coefficient. Linear Regression equations.

Module IV: [10L]

Combinatorial Mathematics: Pigeon Hole Principle. Permutations and Combinations. Binomial Coefficients. Recurrence Relations and Generating Functions. Properties of Fibonacci

Numbers. Principle of Inclusion and Exclusion. Polya's Theory of Counting, Ramsey's Theorem.

Text Books:

1. Discrete Mathematics & Its Applications, K H Rosen, McGrawHill
2. Discrete Mathematics, T. Veerarajan, TMH

Reference Books:

1. Introduction to Graph Theory, D G West, Prentice-Hall of India
2. Discrete Mathematics for Computer Scientists and Engineers, J L Mott, A Kandel and T P Baker, PHI
3. Introduction to Probability and Statistics for Engineers and Scientists, S.Ross, Elsevier
4. Fundamentals of Mathematical Statistics, S. C. Gupta and V. K. Kapoor, Sultan Chand and Sons

Paper Name: ORAL AND WRITTEN COMMUNICATION					
Paper Code: HTMS1102					
Contact hrs per week:	**L**	**T**	**P**	**Total**	**Credit Points**
	3	**0**	**0**	**3**	**3**

Course Outcomes:

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

1. Acquire competence in using English language to communicate.
2. Be aware of the four essential skills of language usage-listening, speaking, reading and writing.
3. Be adept at using various modes of written communication at work.
4. Attain the skills to face formal interview sessions.

Module I [10L]

Communication Skill : Definition, nature & attributes of Communication, Process of Communication, Models or Theories of Communication, Types of Communication, Levels or Channels of Communication, Barriers to Communication.

Module II [10L]

Business Communication: Scope & Importance, Writing Formal Business Letters, Writing Reports, Organizational Communication: Agenda & minutes of a meeting, notice, memo, circular, Project Proposal, Technical Report Writing, Organizing e-mail messages, E-mail etiquette, Tips for e-mail effectiveness.

Module III [10L]

Language through Literature: Modes of literary and non-literary expressions, Excerpts from literary texts (prose, verse and drama), Using language for communication at various cultural and social settings, Descriptive, narrative and expository writing, Writing with a purpose, Writing essays/articles – logical organization of thoughts.

Module IV [10L]

Communication skills at Work: Communication and its role in the workplace, Benefits of effective communication in the workplace, Common obstacles to effective communication.

Approaches and Communication techniques for multiple needs at workplace: persuading, convincing, responding, resolving conflict, delivering bad news, making positive connections.

Text Books:

1. Theories of Communication: A Short Introduction - Armand Matterlart and Michele Matterlart, Sage Publications Ltd.
2. Professional Writing Skills, Chan - Janis Fisher and Diane Lutovich. San Anselmo, CA: Advanced Communication Designs.
3. Business English - Hauppauge, Geffner, Andrew P., New York: Barron's Educational Series.

Reference Books:

1. Writing and Speaking at Work: A Practical Guide for Business Communication - Edward P.Bailey, Prentice-Hall.
2. Business and Administrative Communication - Kitty O. Locker, McGraw-Hill/ Irw
3. Intercultural Business Communication - Lillian Chaney and Jeanette Martin, Prentice Hall.

Paper Name: OBJECT ORIENTED PROGRAMMING LAB					
Paper Code: MCAP1111					
Contact hrs per week:	**L**	**T**	**P**	**Total**	**Credit Point**
	0	**0**	**4**	**4**	**3**

Course Outcomes:

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

1. Understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
2. Be able to use the Java SDK environment to create, debug and run simple Java programs.
3. Implement classical problems using java programming.
4. Implement problems related to inheritance, polymorphism, interfaces, packages, multithreading and collections framework.
5. Build software development skills using java programming for real world applications.
6. Implement backend of an application.

Programs related to the following topics:

1. Language Features
2. Arrays in Java and String Handling
3. Classes and Objects
4. Inheritance
5. Interface and Package
6. Exception Handling
7. Multithreading
8. Event Handling
9. java.util and java.lang

Paper Name: PYTHON PROGRAMMING LAB					
Paper Code: MCAP 1112					
Contact hrs per week:	**L**	**T**	**P**	**Total**	**Credit Point**
	0	**0**	**4**	**4**	**3**

Course Outcomes:

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

1. Interpret, understand and debug syntax errors reported by the python compiler.
2. Apply procedural programming knowledge to solve arithmetic and logical problems.
3. Design, coding and testing Python programs with a basic understanding of top-down design.
4. Apply object-oriented programming concepts to develop dynamic interactive python applications.
5. Create applications to read from and write into files.
6. Understand and use python libraries in real life problems.

Programs related to the following topics:

1. Windows based open-source Individual Distribution.
2. Basic Problem Solving.
3. Control Structures.
4. List, Tuple, Dictionary.
5. Functions.
6. String Handling.
7. Object Oriented Features.
8. File Handling.
9. Simple APIs and Python Lib

Paper Name: COMMUNICATION LAB					
Paper Code: HMTS 1112					
Contact hrs per week:	**L**	**T**	**P**	**Total**	**Credit Points**
	0	**0**	**4**	**4**	**3**

Course Outcomes:

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

1. Acquire the techniques to become an effective listener.
2. Acquire the skill to become an effortless speaker.
3. Organize and present information for specific audience.
4. Communicate to make a positive impact in professional and personal environment.
5. Engage in research and prepare authentic, formal, official documents.
6. Acquire reading skills for specific purpose.

Module I

Formal verbal communication:

- Introduction to formal verbal communication, Interpersonal Skills & Public Speaking: Building Positive Relationships, Focusing on Solving Problems, Time Management, Dealing with Criticism: Offering Constructive Criticism, Responding to Criticism – Managing Conflict: Approaches to Conflict, Resolving Conflict.

- Conversational skills in the business scenario: One-to-one and Group communication, Gender and Culture Sensitivity, Etiquette, Sample Business Conversation, Telephonic Conversation

Module II

Presentation skills:

- Speech Purposes - General: Informative Speeches, Persuasive Speeches, Entertaining Speeches, Methods of Speaking: Speaking from a Manuscript, Speaking from Memory, Impromptu Delivery, Extemporaneous Delivery, Analyzing the Audience, Nonverbal Dimensions of Presentation.

- Organizing the Presentation: the Message Statement, Organizing the Presentation: Organizing the Speech to Inform, The Conclusion, Supporting Your Ideas – Visual Aids: Designing and Presenting Visual Aids, Selecting the Right Medium, Post- presentation Discussion

Module III

Group Discussion:

Introduction to Group Communication, Factors in Group Communication, Status – Group Decision Making: Reflective Thinking, Brainstorming, The Planning Process, Strategies for Successful GDs, Role of Social Awareness (Newspapers, Magazines, Journals, TV News, Social Media), Body Language, Logical Argument, Practice GDs

Module IV

Job Application and Personal Interview:

- Job Application Letter: Responding to Advertisements and Forced Applications, Qualities of Well-Written Application Letters: The You-Attitude, Length, Knowledge of Job Requirement, Reader-

Benefit Information, Organization, Style, Mechanics – Letter Plan: Opening Section, Middle Section, Closing Section.

- Resume and CV: Difference, Content of the Resume – Formulating Career Plans: Self Analysis, Career Analysis, Job Analysis, Matching Personal Needs with Job Profile – Planning your Resume – Structuring the Resume: Chronological Resume, The Functional Resume, Combination Chronological and Functional Resume – Content of the Resume: Heading, Career Goal or Objectives, Education, Work Experience, Summary of Job Skills/Key Qualifications, Activities, Honors and Achievements, Personal Profile, Special Interests, References.

- Interviewing: Types of Interviews, Format for Interviews: One-to-one and Panel Interviews, Employment Interviews, Frequently Asked Questions, Dress Code, Etiquette, Questions for the Interviewer, Simulated Interviews

Syllabus of 2nd semester:

Paper Name: DATA STRUCTURES AND ALGORITHMS					
Paper Code: MCAP1201					
Contact hrs per week:	**L**	**T**	**P**	**Total**	**Credit Points**
	3	**1**	**0**	**4**	**4**

Course outcomes:

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

1. Define the basic data structures and their operations.
2. Evaluate algorithms in terms of time and memory complexity of basic operations.
3. Understand the significance and context of application of different algorithm design techniques.
4. Understand the significance and utility of different data structures and the context of their application.
5. Evaluate solutions of a problem with different data structures and thereby understand how to select suitable data structures for a solution.
6. Create or design an algorithm to aid in the solution of a real world problem.

Module I [10L]

Introduction: Datatype and data structure, Abstract data type, Classification of data structures, Concepts of algorithm design techniques – Divide and conquer, Greedy, Dynamic Programming, Backtracking, Branch and Bound – Examples, Concepts of algorithm analysis - performance measurement and analysis, time and space complexity, introduction to order functions.

Array: Array as a data structure, representation of sparse matrix and polynomials.

Linked List: Single, Circular and Double linked list, Applications.

Module II [8L]

Stack and Queue: Implementation using array and linked list, Applications, Multiple stacks and queue.

Recursion: Principles, types, examples, comparison with iterative methods.

Module III [10L]

Trees: Terminologies, Binary trees – properties, traversal, threads; Heaps and priority queue, Binary Search Trees, Height Balanced trees, m-way Search trees.

Module IV [12L]

Graphs: Representations, Graph search algorithms, Spanning tree algorithms, Shortest path algorithms.

Searching and sorting: Searching - linear, binary, hashing. Sorting - Insertion, Selection, Quick, Merge, Heap, Radix.

Text Books:

1. Classic Data Structures – Debasis Samanta, PHI Learning.

2. Fundamentals of Computer Algorithms - Horowitz, Sahni, Orient Longman

Reference Books:

1. Data Structures, Seymour Lipschutz, McGraw Hill Education
2. Introduction to Algorithms - Cormen et al, PHI Learning
3. Data Structures and Algorithms in Java - Goodrich, Tammasia, Goldwasser, Wiley
4. Data Structures and Algorithms in Python - Goodrich, Tammasia, Goldwasser, Wiley

Paper Name: COMPUTER COMMUNICATION NETWORKS					
Paper Code: MCAP1202					
Contact hrs per week	**L**	**T**	**P**	**Total**	**Credit Point**
	3	**1**	**0**	**4**	**4**

Course Outcomes:

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

1. Learn different aspects of data communication networks, hardware, software and components of a network and their interrelations.
2. Understand the purpose of layered architecture and different protocols.
3. Understand the different LAN protocols and selection of appropriate protocols.
4. Analyze the performance of the different routing protocols.
5. Understand the concept of internetworking, congestion control mechanisms.
6. Learn about quality of service issues.

Module I [10L]

Overview of Data Communication & Networking
Introduction: Data Communication Systems, Networks, Protocols & Standards, the Internet Layered Tasks: Utility of Layering, ISO/OSI Reference Model, TCP/IP Reference Model, Comparison between OSI and TCP/IP
Connecting Devices: Repeater, Hub, Bridge, Switch, Router, Gateway
Switching: Overview of – Circuit Switching, Message Switching, Packet Switching, Virtual Circuit Switching

Physical Layer
Signals: Data & Signals, Data Rate Limits, Transmission Impairments
Digital Transmission: Line Coding, Sampling, Transmission Mode
Analog Transmission: Modulation of Digital Data, Modulation of Analog Signals
Multiplexing: FDM, TDM, WDM
Transmission Media: Guided Media, Unguided Media

Module II [10L]

Data Link Layer
Framing: Character Stuffing, Bit Stuffing
Error Detection & Correction: Types of Error – Single Bit Error, Error Detection, Error Correction
Flow Control: Stop – And – Wait ARQ, Sliding Window Protocols
Data Link Layer Protocols: HDLC, PPP

Medium Access Sub layer
Random Access: ALOHA, Slotted ALOHA, CSMA/CD, CSMA/CA
Controlled Access: Reservation, Polling, Token Passing
LAN: Ethernet (Traditional, Fast and Gigabit), FDDI, DQDB

Module III [10L]

Network Layer

Internetworking, Addressing and Routing: Internetworking, Addressing (Internet Address, Classful Addressing, Subnetting), Routing (Static and Dynamic Routing, Distance Vector Routing, Link State Routing)
Network Layer Protocols: ARP, RARP, IP, ICMP and IGMP, IPv6

Module IV [10L]

Transport Layer Process-to-Process Delivery, UDP, TCP: Process to Process Delivery, User Datagram Protocol and Transmission Control Protocol
Congestion Control & Quality of Service: Data Traffic, Congestion and Congestion Control, Quality of Service (QOS), Techniques to improve QOS – Leaky Bucket and Token Bucket Algorithms

Application Layer Application layer protocols: DNS, Telnet, FTP, SMTP, HTTP, WWW

Text Books:
1. Data Communications & Networking – B.A. Forouzan, TMH.
2. Computer Networks - Andrew S. Tanenbaum, Pearson Education.
3. Data and Computer Communication - William Stallings, PHI.

Reference Books:
1. High speed Networks and Internets - William Stallings, Pearson Education.
2. Cryptography and Network Security - William Stallings, PHI.
3. Computer Networking: A Top Down Approach - Kurose & Ross, Pearson Education.

Paper Name: SOFT COMPUTING					
Paper Code: MCAP 1203					
Contact hrs per week	**L**	**T**	**P**	**Total**	**Credit Point**
	3	**0**	**0**	**3**	**3**

Course Outcomes:

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

1. Understand soft computing concepts, technologies and their role in problem solving.
2. Analyze the genetic algorithms and their applications to solve single-objective and multi-objective optimization problems.
3. Understand the fundamental theory and concepts of neural networks, Identify different neural network architectures, algorithms, applications and their limitations.
4. Understand the knowledge representation using fuzzy rules, approximate reasoning, fuzzy inference systems, and fuzzy logic.
5. Understand the need for approximate analysis and computation methods and use the tenets of rough set theory in developing applications.
6. Effectively use of evolutionary algorithms.

Module I [10L]

Introduction
Introduction to soft computing, Different tools and techniques, Usefulness and applications.

Genetic algorithm (GA)
Basic concepts, Working principle, Encoding, Fitness function, Genetic modeling: Inheritance, Selection, Cross over, Mutation, Bitwise operator, Convergence of GA, Overview of Multi-Objective Genetic Algorithm (MOGA).

Module II [10L]

Neural Network
Structure and function of biological neuron, Artificial neuron, Definition of Artificial Neural Network (ANN), Taxonomy of neural net, Difference between ANN and human brain, Characteristics and applications of ANN, Single layer network, Multilayer Perceptron(MLP), Linear separability, Different activation functions, Back propagation algorithm, Basic concept of convolution and recurrent neural network, Applications of neural networks.

Module III [10L]

Fuzzy sets and Fuzzy logic systems
Overview of classical set theory, Fuzzy sets and Fuzzy relations, Fuzzy set operations, Properties of Fuzzy sets, Cardinality, Properties of Fuzzy relations.

Membership functions
Features of membership functions, Standard forms and boundaries, Standard Fuzzification methods.

Fuzzy to Crisp conversions
Lambda cuts for Fuzzy sets, Fuzzy relations, Defuzzification methods, Overview of classical predicate logic, Fuzzy logic, Approximate reasoning and Fuzzy implication.

Fuzzy rule based systems:
Linguistic hedges, Fuzzy rule based system–Aggregation of Fuzzy rules.

Module IV [10L]

Rough Set
Introduction to Rough sets, Decision table, Indiscernibility relations and set approximation, Reducts& Core, Rough approximation, Decision matrix, Application of Rough set.

Evolutionary Algorithm
Introduction, Key principles of swarm, Overview and application of - Ant colony optimization (ACO), Particle swarm optimization (PSO), Artificial bee colony optimization (ABC)

Text Books:

1. Fuzzy logic with Engineering Applications - Timothy J. Ross, John Wiley and Sons.
2. Neural Networks, Fuzzy Logic and Genetic Algorithms - S. Rajasekaran and G. A. V. Pai, PHI.
3. Soft Computing and Its Applications, Volume One: A Unified Engineering Concept, Volume 1 – Kumar S. Ray, CRC Press.

Reference Books:

1. Genetic Algorithms in search, Optimization & Machine Learning - David E. Goldberg, Pearson India.
2. Artificial Neural Networks - B. Yegnanarayana, PHI.
3. Soft computing - Dilip K. Pratihar, Alpha Science International.

Paper Name: OPERATING SYSTEMS					
Paper Code: MCAP1204					
Contact hrs per week	**L**	**T**	**P**	**Total**	**Credit Point**
	3	**0**	**0**	**3**	**3**

Course Outcomes:

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

1. Analyze the structure of OS and basic architectural components involved in OS design.
2. Analyze and design the applications to run in parallel either using process or thread models of different OS
3. Analyze the various device and resource management techniques for timesharing systems.
4. Understand the Mutual exclusion, Deadlock detection and agreement protocols of operating system
5. Interpret the mechanisms adopted for file sharing in distributed Applications
6. Conceptualize the components involved in designing a contemporary OS

Module I [10L]

Introduction
Introduction to Operating Systems, Concept of batch-processing, single and multi- programming, single and multi-processing, multi-tasking, real time, distributed and parallel processing.

Process and Scheduling
Concept of process, state diagram, process control block, Scheduling-short, medium and long term scheduling.
CPU Scheduling criteria, types of scheduling, non-preemptive and preemptive scheduling algorithms like: First Come First Serve (FCFS), Shortest Job First/Next (SJF/N), Shortest Remaining Time Next (SRTN), Round Robin (RR), Highest Response Ratio Next (HRRN), Priority based scheduling, Multilevel queue scheduling, Multilevel feedback queue scheduling.

Threads
Concept, process vs thread, kernel and user threads, multi-threading models.

Module II [10L]

Inter-process Communication
Shared memory approach, message passing, FIFO, concept of semaphore, critical region, monitor.

Process Synchronization
Concepts, race condition, mutual exclusion, critical section problem and its solutions; synchronization tools - semaphore, semaphore with queue, monitor; discussion of synchronization problems like producer-consumer, readers-writers, dining philosophers, sleeping-barber.

Module III [10L]

Deadlock
Characterization, Prevention, avoidance, detection, recovery.

Memory Management
Address space and address translation; memory partitioning - static and dynamic, different types of fragmentation, swapping, paging, segmentation, virtual memory concepts, demand paging,

performance, page replacement algorithms FIFO, LRU, Optimal page replacement, variants of LRU; frame allocation, thrashing, working set strategy.

Module IV[10L]

Disk Management

Disk structure, disk scheduling algorithms FCFS, SSTF, SCAN, C-SCAN, LOOK, C- LOOK; disk formatting, boot block, bad blocks.

File Systems

File and operations on it, file organization and access; file allocation; directory structures, file allocation methods contiguous, linked, indexed; free space management bit vector, linked list, grouping.

I/O Management

I/O hardware, polling, interrupts, DMA, application I/O interface block and character devices, network devices, clocks and timers, blocking and non-blocking I/O; kernel I/O subsystem scheduling, buffering, caching, spooling, error handling.

Protection and Security

Concepts of domain, Access matrix and its implementation, access control. Security concepts, program threats, system threats, threat monitoring, cryptography as security tool, user authentication.

Text Books:

1. Operating System Concepts - Silberschatz, Galvin, Gagne,Wiley.
2. Operating Systems -Dietel, Dietel, Choffnes, Prentice Hall.
3. Operating Systems and Systems Porgramming, Balakrishna Prasad, Scitech.

Reference Books:

1. Operating Systems Design and Implementation - Andrew S. Tanenbaum, Prentice Hall
2. Operating Systems Internals and Design Principles - Stallings, Pearson.
3. Operating Systems: A Concept-Based Approach, D. Dhamdhere, TMH.
4. Operating Systems: Concept and Design, Milan Milenkovic, TMH.

Paper Name: INFORMATION SYSTEM ANALYSIS AND DESIGN					
Paper Code: MCAP1205					
Contact hrs per week:	**L**	**T**	**P**	**Total**	**Credit Points**
	3	**0**	**0**	**3**	**3**

Course Outcomes:

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

1. Understand the idea of information system in lieu of the modern abstraction of data.
2. Analyze various phases of system development life cycle.
3. Gather data to analyze and specify the requirements of a system.
4. Design system components and environments.
5. Analyze the feasibility of a project.
6. Deliver various types of system documentation.

Module I [10L]

Data and Information: Types of information: operational, tactical, strategic and statutory. Why do we need information systems? Requirement of information at different levels of management, Requirement of information for various functions. Quality of information.

Systems Analysis and Design Life Cycle: System definition and concepts, system environments and boundaries. Real time and distributed systems, basic principles of successful systems. Role and attributes of a systems analyst. Requirements determination, requirements specifications, feasibility analysis, final specifications, hardware and software study, system design, system implementation, system evaluation, system modification. Model - Waterfall model, incremental and evolutionary process models; specialized Model – The Unified Process, agile process, and agile models.

Module II [10L]

Information gathering: Strategies and methods. System requirements specification.

Feasibility analysis: Deciding project goals, examining alternative solutions, cost–benefit analysis, quantifications of costs and benefits, payback period, system proposal preparation for managements, parts and documentation of a proposal, tools for prototype creation.

Data flow diagrams: Rules and conventions, levels of DFDs, logical and physical DFDs, Developing DFDs. Software tools to create DFDs. Case study.

Module III [10L]

Structured systems analysis and design: Procedure specifications in structured english, Data dictionary, Decision tree, Decision tables for complex logical specifications, Specification oriented design vs. Procedure oriented design. Case study.

Data oriented systems design: Entity relationship model, E-R diagrams, Entity and Entity Instances, Attributes, Entity Relationships, Cardinality of Relationships, Strong and Weak Entity, Generalization, Specialization, Aggregation, Developing an ER Diagram, Entity Integrity and Primary Key. Case study.

Coding practices: Coding techniques, requirements of coding schemes, error detection of codes.

Module IV [10L]

Data input methods: Input Design, validating input data, input data controls, interactive data input.

Designing outputs: Designing output reports- screen design, graphical user interfaces, interactive I/O on terminals.

Form design: Classification of forms, requirements of form design, Types of forms, Layout considerations, Form control.

System control: Need for controls, objectives of controls, techniques used in controls, Gantt chart.

System audit and security: Audit of Computer System Usage. Types of Threats to Computer System and Control Measures, Threat and Risk Analysis, Disaster Recovery and Contingency Planning, Viruses.

Text Books:

1. Analysis and Design of Information Systems, V. Rajaraman, PHI.
2. Systems Analysis and Design - Kendall, Kenneth E and Julie E. Kendall, 7th Edition, PHI.
2. Systems Analysis & Design - Alan Dennis, Barbara H. Wixom and Roberta M Roth, 4th Edition, Wiley & Sons.

Reference Books:

1. System and Design Methods - Jeffrey, L. Whitten and Lonnie D. Bentley, 6th Edition, TMH.
2. Modern Systems Analysis and Design - Jeffrey A. Hoofer, Joey F. George and Joseph S. Valacich, 5th Edition, Pearson Education.
3. Systems Analysis and Design Techniques, Methodologies, Approaches, and Architectures, Roger H.L.Chinan, KengSiau, and Bill C. Hardgrave, 1st Edition, Prentice Hall of India.
4. Software Engineering: A Practitioner's Approach - Roger. S. Pressman, 7th Edition, McGraw Hill.

Paper Name: DATA STRUCTURES AND ALGORITHMS LAB					
Paper Code: MCAP1211					
Contact hrs per week	**L**	**T**	**P**	**Total**	**Credit Points**
	0	**0**	**4**	**4**	**3**

Course Outcomes:

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

1. Demonstrate the concepts of Stack, Queue and Linked List and various operations on them.
2. Suggest appropriate linear / non-linear data structure operations for solving a given problem
3. Write algorithms to implement different data structures and their operations.
4. Solve the faults / errors that may appear due to wrong choice of data structure.
5. Assess how the choice of data structures and algorithm design methods impacts the performance of programs.
6. Design programs based on different searching and sorting techniques.

Problems related to the following topics:

1. Sparse matrix and polynomials representation using arrays
2. Linked list implementation and operations
3. Stack and Queue implementation using array and linked list, applications
4. Different operations on Binary search tree
5. Graph traversal, Spanning tree algorithms, Shortest path algorithms
6. Different searching and sorting algorithms.

Paper Name: COMPUTER NETWORK LAB					
Paper Code: MCAP1212					
Contact hrs per week	**L**	**T**	**P**	**Total**	**Credit Point**
	0	**0**	**4**	**4**	**3**

Course Outcomes:

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

1. Understand the TCP/IP configuration for Windows and Linux.
2. Implement device sharing on network.
3. Learn the major software and hardware technologies used on computer networks
4. Learn the terminology and concepts of network management in Linux platform by understanding shell commands and implementing the same.
5. Understand the concepts of protocols, network interfaces, anddesign/performance issues through programs.

Problems related to the following topics:

UNIX Fundamentals
1. Basic UNIX Commands
2. Writing Shell Scripts

Network Programming on the following (To be implemented in Java/C/C++)
1. IPC: a) Pipes b) FIFO
2. File transfer using message queue form of IPC
3. TCP sockets (like date and time server & client, echo server & client, etc.)
4. UDP sockets (like simple DNS)
5. Raw sockets (like packet capturing and filtering)
6. Sliding window protocol and cyclic redundancy check
7. Routing protocols
8. Study of TCP/UDP performance
9. TCP client and server application to transfer file
10. UDP client and server application to transfer a file
11. RPC

Testbed Development and Simulators
1. Creating a LAN
2. Use of Network Simulators for Network Modeling (basic ideas/ demonstration only)

Reference Books:
1. Advance UNIX Programming - Richard Stevens, Pearson Education.
2. Advance UNIX Programming - N.B. Venkateswarlu, BS Publication.

Subject: CAREER DEVELOPMENT AND MANAGEMENT					
Paper Code: HMTS 1221					
Contact hrs per week	**L**	**T**	**P**	**Total**	**Credit Point**
	0	**0**	**3**	**3**	**2**

Course Outcomes:

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

1. Employ the technique of SWOT analysis to decide goals and plans.
2. Be able to map their skills according to the basic job profile.
3. Upgrade and enhance generic and specific skills.
4. Be aware of the dynamics of communication under diverse cultural setup.
5. Be aware of the start-up eco system in India& acquire tools to take up entrepreneurship as a career opportunity.
6. Achieve work-life balance by managing both organizational and personal crisis.

Module I: Professional Growth

Self-Growth: Anger, stress and time management-Theories and application, SWOT analysis.
Skill identification and Skill up gradation- (generic and specific), Local and global skills, Knowledge sources such as MOOC, NPTEL
Career Planning-Skill mapping to job profile, Basic and add-on qualifications, Career growth, Self-appraisal, Lifelong learning
Assessment - Activity (20 marks)

Module II: Professional Communication

Impression Management
Employability Quotient
Cross-cultural communication
Leadership & Team Playing: Theories, Styles, Stages
Motivation, Negotiation Skills, Conflict Management
Planning & Envisioning: Initiative and Innovation in the Work Environment
Assessment- Written (30 marks)

Module III: Entrepreneurship

The start-up ecosystem in India- Why entrepreneurship? Indian tech start-up landscape, Stand-up India policies, funding agencies, market development, trends and best practices
E-Commerce- India as a growing E-commerce market, Possibilities of growth, funding, niche retailers
Make in India- New processes, Investments, Focus sectors, Makers of Make in India, Opportunities and Policies
Assessment- Project (30 marks)

Module IV: Working and Living Happily

Managing crisis- Organisational and personal crisis, Analysing crisis, Turnaround strategies, learning from crisis as opportunity
Work-life balance- Performance-expectation management, Personal and professional goal- mapping
Understanding happiness- Components, Conflicts, Happiness Index

Assessment: Activity/case (20 marks)

Reference Books:

1. Basic Managerial Skill for All by E. H. McGrath.SJ. Pub: PHI, New Delhi.
2. The Start-up Equation by Steven Fisher and Jae-Nae Duane. Pub: Mc Graw Hill Education (India) Pvt. Ltd. New Delhi.
3. Live Happily, Work Happily by Siddhartha Ganguli. Pub: Allied Publishers Pvt.Ltd. New Delhi.
4. Crisis Management: Planning for the Inevitable by Steven Fink. Pub: iUniverseInc.USA.
5. Influencer: The New Science of Leading Change by Joseph Grenny&Kerey Patterson. Pub:McGraw Hill Education , USA.
6. Soft Skills: An Integrated Approach to Maximise Personality by Gajendra Singh Chauhan and Sangeeta Sharma, Wiley, 2016