| **Program:** Master of Computer Applications (MCA) | | | | **Semester:** I | |
|---|---|---|---|---|---|
| **Course:** Operating Systems | | | | **Code**: 703CO1C002 | |
| **Teaching Scheme** | | | | **Evaluation Scheme** | |
| **Lecture (Hours per week)** | **Practical (Hours per week)** | **Tutorial (Hours per week)** | **Credit** | **Internal Continuous Assessment (ICA) (marks -50)** | **Term End Examinations (TEE) (marks -100)** |
| 2 | 2 | 0 | 3 | Marks Scaled to 50 | Marks Scaled to 50 |

**Prerequisite:** Programming, Computer Organization and Architecture, Data Structures and Algorithms

**Course Objective**

The objective of this course is to provide an introduction to functions of the computer operating system.

**Course Outcomes**

After completion of the course, students will be able to -

1. Describe the fundamental concepts of Operating system
2. Apply process management strategies
3. Simulate memory management, I/O management and file management strategies.

**Detailed Syllabus**

| Unit | Description | Duration |
|---|---|---|
| 1 | **Operating System Overview:** Operating system objectives and functions, evolution of operating system, basic concepts: Processes, Files, System Calls, Layered structure v/s Monolithic structure of OS | **02** |
| 2 | **Process and Process Scheduling:** Process Description, Process Control Block (PCB), Threads, Thread management, comparison between Processes and threads, Process Scheduling: Types, study and comparison of various scheduling algorithms | **06** |
| 3 | **Process Concurrency:** Principles of Concurrency, Mutual Exclusion-Hardware Approaches, Semaphores, Monitors, Message Passing, Classical IPC Problems: Reader's / Writer's Problem, Producer / Consumer Problem | **06** |
| 4 | **Deadlock:** Principles of Deadlock, Deadlock Prevention, Deadlock Avoidance: Banker's algorithm, Deadlock detection and Recovery, Dining Philosopher Problem | **05** |
| 5 | **Memory Management:** Memory Management Requirements, Memory Partitioning, Paging, Segmentation, Page Replacement algorithms | **06** |

Mukesh Patel School of Tech. Mgmt. & Engg. SVKM'S NMIMS Mumbai 56

**Signature**

**(Prepared by Concerned Faculty/HOD)** AY 2024-25

| | | |
|---|---|---|
| 6 | **I/O Management and Disk Scheduling:** I/O devices, organization of I/O function, I/O buffering, Disk structure, Disk scheduling algorithms | **03** |
| 7 | **File Management:** Overview, File Organization, File Directories, File Sharing | **02** |
| | **Total** | **30** |

**Text Books**

1. Silberschatz A. Galvin, *Operating Systems Principles*, 10th Ed., Global Editions, 2023.
2. William Stallings, *Operating Systems: Internals and Design Principles*, 9th Edition, Pearson Education, 2018.

**Reference Books**

1. Andrew S. Tannenbaum, *Modern Operating System*, 4th Edition, Pearson Education, 2016.

**Laboratory Work:**

8 to 10 experiments (and a practicum where applicable) based on the syllabus.

Mukesh Patel School of Tech. Mgmt. & Engg. SVKM'S NMIMS Mumbai 56

**Signature**

**(Prepared by Concerned Faculty/HOD)** AY 2024-25

**SVKM's NMIMS**
**Mukesh Patel School of Technology Management & Engineering**

| **Program:** Master of Computer Applications (MCA) | | | | **Semester:** I | |
|---|---|---|---|---|---|
| **Course:** Database Management Systems | | | | **Code:** 703AI0C003 | |
| **Teaching Scheme** | | | | **Evaluation Scheme** | |
| **Lecture (Hours per week)** | **Practical (Hours per week)** | **Tutorial (Hours per week)** | **Credit** | **Internal Continuous Assessment (ICA) (Marks - 50)** | **Term End Examinations (TEE) (Marks - 100)** |
| 2 | 2 | 0 | 3 | Marks Scaled to 50 | Marks Scaled to 50 |

**Pre-requisite:** Nil

**Course Objective**

The objective of the course is to provide a comprehensive introduction to the fundamental concepts for design and development of database systems, with an emphasis on how to organize, maintain and retrieve - efficiently, and effectively - information from a database management system

**Course Outcomes**

After completion of the course, students will be able to -

1. Describe core concepts of database and model a database management system through ER modelling
2. Apply knowledge of relational algebra and structured query language to retrieve and manage data from relational database
3. Demonstrate the use of normalization for database design
4. Demonstrate the concept of transactions and use modern database techniques such as NoSQL

**Detailed Syllabus**

| Unit | Description | Duration |
|---|---|---|
| 1. | **Introduction**<br>Database System Applications, Purpose of Database Systems, View of Data, Database Languages, Data Models, Database Users and Administrator | **03** |
| 2. | **Database Design and the E-R Model**<br>Overview of the Design Process, The Entity-Relationship Model, Constraints, Entity Relationship Diagrams, Reduction to Relational Schemas, Schema Diagrams , Entity-Relationship Design Issues, Extended ER features | **05** |
| 3. | **Introduction to the Relational Model**<br>Structure of Relational Databases, Database Schema, Keys, Relational Algebra, Basic operators of Relational Algebra, | **03** |
| 4. | **Structured Query Language**<br>Overview of the SQL Query Language, SQL Data Definition, SQL Constraints, Basic Structure of SQL Queries, Additional Basic Operations, DML operations, Set operations, Aggregate Functions, Nested Sub-queries, Joins, views | **06** |

Signature
(Head of the Department)

| | | |
|---|---|---|
| 5. | **Relational Database Design**<br>Features of Good Relational Designs, Problems with bad design, Decomposition using concept of functional dependencies, Armstrong's axioms, Closure of functional dependency, Closure of attribute, Introduction to process of Normalization and de-normalization, Normal Forms- 1NF, 2NF, 3NF, BCNF | **05** |
| 6. | **Transactions**<br>What is Transactions? Properties of transaction, Transaction states, Issues with concurrent executions, Schedules, Serializability- Conflict and View | **04** |
| 7. | **Introduction to NoSQL**<br>Overview of NoSQL, characteristics of NoSQL, Storage types of NoSQL, Implementing NoSQL in MongoDB - Managing Databases and Collections from the MongoDB shell, Finding Documents in MongoDB collection from the MongoDB shell. | **04** |
| | **Total** | **30** |

**Text Books**

1. Hennery Korth and Abraham Silberschatz, *Database System Concepts*, 7th Edition, McGraw Hill, 2019.
2. Elmarsi and Navathe, *Fundamentals of Database Design*, 7th Edition, Addison Wesley, 2019.
3. A Phaltankar, J. Ahsan, M. Harrison, L. Nevdov, *MondoDB Fundamental*, Packt Publishing, 2020.

**Reference Books**

1. Bob Bryla, Kevin Loney *Oracle Database 12C The Complete Reference*, 1st Edition, Tata McGraw Hill, 2017.
2. Marko Aleksendric, Arek Borucki, *Mastering MongoDB 7.0*, Packt Publishing, 2024.

**Laboratory Work**

8 to 10 experiments (and a practicum where applicable) based on the syllabus

Signature
(Head of the Department)

| **Program:** Master of Computer Applications (MCA) | | | | **Semester:** I | |
|---|---|---|---|---|---|
| **Course:** Computer Networks | | | | **Code:** 703AI0C004 | |
| **Teaching Scheme** | | | | **Evaluation Scheme** | |
| **Lecture (Hours per week)** | **Practical (Hours per week)** | **Tutorial (Hours per week)** | **Credit** | **Internal Continuous Assessment (ICA) (Marks - 50)** | **Term End Examinations (TEE) (Marks - 100)** |
| 2 | 2 | 0 | 3 | Marks Scaled to 50 | Marks Scaled to 50 |

**Prerequisite:** NA

**Course Objective**

This course provides the fundamental knowledge of computer networks through understanding each layer of computer network architecture, and transmission systems to network applications. It also focuses on congestion control techniques, protocols, and application layer functions.

**Course Outcomes**

After completion of the course, students will be able to -

1. Explain the concepts of computer networks, topologies and data communication
2. Analyze the various error detection and correction and medium access techniques
3. Apply network layer addressing and routing techniques to different network topologies
4. Analyze the different protocols of the layered architecture of computer networks

**Detailed Syllabus**

| **Unit** | **Description** | **Duration** |
|---|---|---|
| 1. | **Introduction**<br>Computer Network, Peer-to-peer and client-server communication, Classifications of computer networks, Network Topologies. | **02** |
| 2. | **Physical Layer**<br>Introduction to OSI and TCP/IP model, Transmission Media. | **02** |
| 3. | **Data Link Layer and Medium Access Sub Layer**<br>Fundamentals of Error Detection and Error Correction, Block coding, Hamming Distance, Flow Control and Error control; error control mechanism - CRC; flow control protocols - Stop and Wait ARQ, Go-back–N ARQ, Selective Repeat ARQ, Multiple access protocols - Random Access - Pure ALOHA, Slotted ALOHA, CSMA/CD, CDMA/CA. | **07** |
| 4. | **Network Layer**<br>Switching techniques, IPV4 addressing, subnet mask, classless inter-domain routing (CIDR), IPV6; Address mapping – ARP, RARP, and DHCP, shortest path algorithm- RIP, Bellman-ford algorithm, link state routing, Dijkstra's algorithm, Open shortest path first protocol (OSPF). | **09** |

Signature
(Head of the Department)

| | | |
|---|---|---|
| 5. | **Transport Layer**<br>Process to Process Communication, User Datagram Protocol (UDP)- services, operation; Transmission Control Protocol (TCP) - features, 3-way handshaking, comparison of UDP and TCP, SCTP, Congestion Control - open loop and close-loop; Quality of Service (QoS), QoS improving techniques - Leaky Bucket and Token Bucket algorithms. | **06** |
| 6. | **Application Layer**<br>HTTP, DNS, FTP, SMTP. | **04** |
| | **Total** | **30** |

**Text Books**

1. A. S. Tanenbaum, *Computer Networks*, 5th Edition, Pearson Prentice Hall, 2018.
2. Behrouz A. Forouzan, *Data Communications and Networking*, 5th Edition, McGraw-Hill Higher Education, 2017.

**Reference Books**

1. W. Stallings, *Data and Computer Communications*, 10th Edition, Pearson Prentice Hall, 2018.
2. Behrouz A. Forouzan and Sophia Chung Fegan, TCP/IP Protocol Suite, 4th Edition, McGraw-Hill Higher Education, 2019 (Re-print).
3. Alberto Leon-Garcia and Indra Widjaja, *Communication Networks: Fundamental Concepts and Key Architectures*, 2nd Edition, McGraw-Hill, 2004 (Classic).
4. James F. Kurose and Keith W. Ross, *Computer Networking - A Top-down Approach*, 8th Edition, Pearson, 2018 (Re-print).

**Laboratory Work**

8 to 10 experiments (and a practicum where applicable) based on the syllabus.

Signature
(Head of the Department)

SVKM's NMIMS University
Mukesh Patel School of Technology Management & Engineering

| **Program:** Master of Computer Applications (MCA) | | | | **Semester:** I | |
|---|---|---|---|---|---|
| **Course:** Data Structures and Algorithms | | | | **Code:** 703CO0C006 | |
| **Teaching Scheme** | | | | **Evaluation Scheme** | |
| **Lecture (Hours per week)** | **Practical (Hours per week)** | **Tutorial (Hours per week)** | **Credit** | **Internal Continuous Assessment (ICA) (Marks - 50)** | **Term End Examinations (TEE) (Marks- 100 )** |
| 3 | 2 | 0 | 4 | Marks Scaled to 50 | Marks Scaled to 50 |

**Prerequisite:** Programming for Problem Solving

**Course Objective**

This course imparts knowledge of data structures and algorithms so as to identify and implement appropriate data structure and determine the computational complexity of the given application.

**Course Outcomes**

After completion of the course, students will be able to -

1. Understand the concept of data structures and computational complexity
2. Identify and implement appropriate linear data structure for the given problem.
3. Identify and implement appropriate non-linear data structure for the given problem.
4. Differentiate various searching and sorting algorithms.

**Detailed Syllabus**

| Unit | Description | Duration |
|---|---|---|
| 1 | **Introduction**<br>Introduction to data structure and its importance, Classification of data structures, Basic operations., Abstract data type, Performance analysis- time and space complexity, Asymptotic Notations. | 04 |
| 2 | **Linear Data Structure I**<br>Representation of arrays in memory, Operations on arrays -Traversal, Insertion, Deletion. Introduction to Stacks, Operations on Stacks, Applications of stacks - Expression conversion and evaluation (Polish notation), Balanced parenthesis checker, Recursion, Introduction to Queue,<br>Operation on Queues, Linear queue Circular queue, Priority queue, Application of Queues. | 10 |
| 3 | **Linear Data Structure II**<br>Introduction to linked list, Representation of linked list in memory, Singly linked list and its operations, Introduction to Doubly Linked list Linked list representation of Stack and Queues, Applications of linked list – Polynomial Addition | 07 |
| 4 | **Non-Linear Data Structures - I** | 10 |

Mukesh Patel School of Tech. Mgmt. & Engg. SVKM'S NMIMS Mumbai 56

**Signature**

**(Prepared by Concerned Faculty/HOD)** AY 2024-25

| | | |
|---|---|---|
| | Introduction, Binary tree terminologies, Representation of Binary trees in memory, Binary Tree traversal algorithms, Construction of Binary Tree from traversals, Binary Search Tree: Insertion, Deletion, Applications of tree data structure: Expression trees, Huffman trees. | |
| 5 | **Non- Linear Data Structures - II**<br>Introduction, Graph theory terminology, Representation of graph: Adjacency Matrix, Adjacency List, Graph Traversal: Breadth first search, Depth first search, Applications of Graphs (Problem Solving): Shortest path (Dijkstra's algorithm), Minimum Spanning Tree. | 06 |
| 6 | **Searching and Sorting**<br>Linear Search, Binary Search, Selection Sort, Insertion sort, Merge sort, Introduction to Hashing | 08 |
| | **Total** | **45** |

**Text Books**

1. Seymour Lipschutz, "*Data structures with C*", Schaum's Outlines, 1st Edition, 2017. ISBN-13 : 978-0070701984.
2. Reema Thareja, "*Data Structures using C*", Oxford University Press, 3rd Edition, 2023.
3. Y. Langsam, M.J. Augenstein, A.M. Tenenbaum, "*Data Structures using C and C++*", PHI 2nd Edition, Pearson Education, 2015. ISBN 9789332549319

**Reference Books**

1. Richard F. Gillberg, Behrouz A. Forouzen, "*Data Structures – A Pseudo Approach with C*", Cengage Publication, 2nd Edition 2004. (Classic)
2. Mark Allen Weiss, "*Data Structures and Algorithm analysis in C++*", PHI, 4th Edition, 2013. ISBN-13: 9780132847377 Data Structures and Algorithm Analysis in C++ (pearson.com)
3.Thomas, H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, "*Introduction to Algorithms*", MIT Press, 3rd Edition 2009.

**Laboratory Work**

8 to 10 experiments (and a practicum where applicable) based on the syllabus.


**Signature**

**(Prepared by Concerned Faculty/HOD)** AY 2024-25

SVKM's Narsee Monjee Institute of Management Studies
Mukesh Patel School of Technology Management & Engineering

| **Program:** Master of Computer Applications (MCA) | | | | **Semester:** I | |
|---|---|---|---|---|---|
| **Course:** Java Programming | | | | **Code:** 703CO0C018 | |
| **Teaching Scheme** | | | | **Evaluation Scheme** | |
| **Lecture (Hours per week)** | **Practical (Hours per week)** | **Tutorial (Hours per week)** | **Credit** | **Internal Continuous Assessment (ICA) (Marks - 50)** | **Term End Examinations (TEE) (Marks - 100)** |
| 2 | 4 | 0 | 4 | Marks Scaled to 50 | Marks Scaled to 50 |

**Prerequisite**: NA

**Course Objective**

This course will impart knowledge of object-oriented programming, building graphical user interface and database connectivity using Java.

**Course Outcomes**

After completion of the course, students will be able to -

1. Implement programs using object oriented programming paradigm
2. Implement programs using collection and generics concepts
3. Develop GUI application with database connectivity

**Detailed Syllabus:**

| Unit | Description | Duration |
|---|---|---|
| 1 | **Java Fundamentals**<br>Overview of Java, Using Blocks of code, Lexical Issues, Java Class Libraries, Data Types, Variables and Arrays, Operators, Control Statements, Command Line Arguments. | **02** |
| 2 | **Classes and Methods**<br>Class fundamentals, Declaring Objects, Constructors, Methods, Overloading of methods, Access control, Static and final variables. | **04** |
| 3 | **Inheritance**<br>Inheritance Basics, method overriding, using abstract classes, using final with inheritance. | **04** |
| 4 | **Packages and Interfaces**<br>Packages, Access Protection, importing packages, , Interfaces: Defining an Interface, Implementing Interfaces , Applying Interfaces, Variables in Interfaces. | **03** |
| 5 | **Exception Handling**<br>Exception handling fundamentals, exception types, uncaught exceptions, using try and catch, throw, throws, finally, Java's built-in exceptions, creating your own exceptions. | **02** |

Mukesh Patel School of Tech. Mgmt. & Engg. SVKM'S NMIMS Mumbai 56

**Signature**
**(Prepared by Concerned Faculty/HOD)**

AY 2024-25

| | | |
|---|---|---|
| 6 | **Programs using String Handling**<br>String Constructors, Special String operators, Character Extraction, String Comparison, Searching Strings and Modifying Strings, Buffer class and its methods. | **02** |
| 7 | **Generics and Collections**<br>Generics: Introduction, A Generic class with Type Parameters, General Form of a Generic class, Bounded Types, Using wildcard arguments, Creating a Generic Method, Generic class Hierarchies,<br>Collection: Collection Framework, ArrayList class, List Iterator interface, Linked List class, TreeSet class | **05** |
| 8 | **GUI design and Event Handling using Java FX**<br>Introduction, JavaFX Architecture, application structure, JavaFX, Text, Effect, Anim, UI controls. Types of Events, Processing Events in JavaFX, Event Delivery Process, Event Handlers. | **05** |
| 9 | **Java and Database Programming**<br>JDBC Architecture, Types of Drivers, JDBC components, JDBC classes and Interfaces, steps for querying the database with JDBC, Database connection, querying and updating database tables, passing parameters to a statement. | **03** |
| | **Total** | **30** |

**Text Books:**

1. Herbert Schildt, *Java The Complete Reference*, 11th Edition, Oracle Press, 2020.
2. Sergey Grinev, *Mastering JavaFX10*, Packt Publishing, 2018.

**Reference Books:**

1. Cay Horstmann, *Core Java Volume I- Fundamentals*, Pearson Education Inc., 2020.
2. Carl Dea, Gerrit Grunwald, José Pereda, Sean Phillips, Mark Heckler, *JavaFX 9 by Example*, 3rd Edition, Apress, 2017.

**Laboratory / Tutorial work:**

8 to 10 experiments (and a practicum where applicable) based on the syllabus.

Mukesh Patel School of Tech. Mgmt. & Engg. SVKM'S NMIMS Mumbai 56

**Signature**
**(Prepared by Concerned Faculty/HOD)**

SVKM's NMIMS
Mukesh Patel School of Technology Management & Engineering

| **Program:** Master of Computer Applications (MCA) | | | | **Semester:** I | |
|---|---|---|---|---|---|
| **Course :** Web Technologies | | | | **Code :** 703CO1C001 | |
| **Teaching Scheme** | | | | **Evaluation Scheme** | |
| **Lecture (Hours per week)** | **Practical (Hours per week)** | **Tutorial (Hours per week)** | **Credit** | **Internal Continuous Assessment (ICA) (Marks - 50)** | **Term End Examinations (TEE) (Marks - 50)** |
| 2 | 4 | 0 | 4 | Marks Scaled to 50 | Marks Scaled to 50 |

**Pre-requisite**: Basic Programming knowledge

**Course Objective**

This course is designed to enable students to develop front end and back end with database of real time web applications using technologies like HTML, CSS, Javascript, PHP.

**Course Outcomes**

After completion of the course, students will be able to -

1. Design responsive front end of the web applications
2. Develop business logic using server side scripting
3. Implement database connectivity

**Detailed Syllabus:**

| Unit | Description | |
|---|---|---|
| 1 | **HTML5**<br>Introduction to Hypertext Markup Language, Web Page Structure, Basic Tags, attributes, heading, paragraphs, formatting, images, Links, Lists, Frames, Tables, Forms, HTML5- new elements, Input Types, media. | **05** |
| 2 | **CSS3**<br>Introduction to styles, Syntax & Rules, External, Internal/Embedded, Inline Style Sheets, conflicting styles, Property Value Forms, Font Properties, List Properties, Color & Background Properties, Text Properties, Image as bullets, Introduce different Box Model, CSS3- Backgrounds, Text effects, 2D & 3D transforms, transitions, animations. Responsive Websites design with HTML5 and CSS3. | **04** |
| 3 | **JavaScript and JQuery**<br>JavaScript Introduction, variables, operators, data types, functions, objects, condition and looping structures, functions, string, arrays, Java Script Objects, Events handling. Form validations using Java Script.<br>JQuery Introduction, Syntax, Selectors, Events, JQuery Effects. | **06** |
| 4 | **BootStrap4**: Introduction, Grids, Tables, Images, Dropdowns, Jumbotrons. | **03** |
| 5 | **PHP – Server Side Programming** | **08** |

Mukesh Patel School of Tech. Mgmt. & Engg. SVKM'S NMIMS Mumbai 56

**Signature**
**(Prepared by Concerned Faculty/HOD)**

AY 2024-25

| | | |
|---|---|---|
| | Introduction, variables, data types, constants, decision and control statements, PHP functions, Arrays, Form Handling, form validations, Pattern Matching, cookies, Session Tracking, Error handling. | |
| 6. | **Database Access with PHP**<br>Introduction to MySQL database system, PHP and MySQL database connectivity (Create, connect, select, insert, update, delete, where clause, group by clause, Order by clause). | **04** |
| | **Total** | **30** |

**Text Books:**

1. Kogent Learning Solutions Inc, *HTML 5 Black Book (Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP, jQuery)* , 2nd Edition, Dreamtech Press,2016.
2. Dayley Brad, Dayley Brendan, *AngularJS, JavaScript, and jQuery*,1st Edition, Pearson Education, 2016.
3. Jacob Lett, Bootstrap *4: Responsive Web Design and Development*, Bootstrap Creative, 1st Edition, Dream Tech Press, 2018.
4. Deane Barker, *Web Content Management Systems: Features and Practices*, 1st Edition,O'Reily Media Inc, 2016.

**Reference Books:**

1. Ben Frain, *Responsive Web Design with HTML5 and CSS*, Packt Publishing, 3rd Edition, 2020.

**Laboratory / Tutorial work:**

8 to 10 experiments (and a practicum where applicable) based on the syllabus.

Mukesh Patel School of Tech. Mgmt. & Engg. SVKM'S NMIMS Mumbai 56

**Signature**
**(Prepared by Concerned Faculty/HOD)**

SVKM's NMIMS Deemed-to-be University
Mukesh Patel School of Technology Management and Engineering

| **Program:** Master of Computer Applications (MCA) | | | | **Semester**: I | |
|---|---|---|---|---|---|
| **Course:** English Communication | | | | **Code:** 703BS0C006 | |
| **Teaching Scheme** | | | | **Evaluation Scheme** | |
| **Lecture (Hours per week)** | **Practical (Hours per week)** | **Tutorial (Hours per week)** | **Credit** | **Internal Continuous Assessment (ICA) (Marks - 50)** | **Term End Examination (TEE)** |
| **0** | **2** | **0** | **1** | **Marks Scaled to 50** | **-** |

**Pre-requisite: -**

**Course Objective**

The objective of the course is to develop students' competency in the English language in relation to listening, speaking and reading.

**Course Outcomes**

After completion of the course, the students will be able to –

1. Use their knowledge of vocabulary and grammar to articulate their ideas effectively
2. Demonstrate effective listening and speaking skills in oral communication situations such asspeeches, conversations, power-presentations, etc
3. Apply different reading techniques as needed to read passages effectively

**Detailed Syllabus**

| Unit | Description | Duration |
|---|---|---|
| 1. | **Vocabulary Building through Literature**<br>Introduction to root and affixes, Synonyms and antonyms, Idioms and phrasal verbs, Commonly confused words, Words: denotation, connotations and usage | **06** |
| 2. | **Useful Practices of Grammar**<br>Articles and Prepositions, Subject-verb agreement, noun-pronoun agreement, Personal Pronouns (First Person, Second Person, Third Person), Modifiers – Errors in Modifiers (Misplaced, Dangling, Squinting), Redundancies and clichés, Tenses, Parallelism, Punctuation, Sentences, clauses and phrases, Active and passive voice,<br>direct and indirect speech | **06** |
| 3. | **Oral Communication**<br>Listening skills, Public speaking, impromptu speaking, Situational dialogues | **06** |

Mukesh Patel School of Tech. Mgmt. & Engg. SVKM'S NMIMS Mumbai 56

**(Prepared by Corned Faculty/HOD)**

AY 2024-25

| | | |
|---|---|---|
| 4. | **Comprehension through Short Fiction**<br>Fast Reading, Skimming, Scanning, Active Reading, Cloze Reading, SQ3R<br>Technique | **06** |
| 5. | **Presentations**<br>Planning – occasion, audience, purpose, Outlining – introduction, main body,conclusion, Visual slide design, Verbal, non-verbal communication | **06** |
| | **Total** | **30** |

**Text Books**

1. Meenakshi Raman and Sangeeta Sharma, *Technical Communication: Principles and Practice*, 3rd ed. Oxford University Press, 2015
2. Mark Lester and Larry Beason, *The McGraw-Hill Education Handbook of English Grammar and Usage*, 3rd ed. McGraw Hill, 2019

**Reference Books**

1. Bovee Courtland and John Thill, *Business Communication Today*, Pearson Education, 14th Ed. 2017
2. John Seely, *Oxford Guide to Effective Writing and Speaking*, Oxford University Press, 3rd Ed. 2013
3. Michael Swan, *Practical English Usage*, Oxford University Press, 4th Ed. 1995
4. F.T Wood, *Remedial English Grammar*. Macmillan. 2007

**Laboratory Work**

8 to 10 experiments based on the syllabus.

Mukesh Patel School of Tech. Mgmt. & Engg. SVKM'S NMIMS Mumbai 56

**(Prepared by Corned Faculty/HOD)**

| **Program:** Master of Computer Applications (MCA) | | | | **Semester:** I | |
|---|---|---|---|---|---|
| **Course:** Design Thinking | | | | **Code:** 703BS0C007 | |
| **Teaching Scheme** | | | | **Evaluation Scheme** | |
| **Lecture (Hours per week)** | **Practical (Hours per week)** | **Tutorial (Hours per week)** | **Credit** | **Internal Continuous Assessment (ICA) (Marks -50)** | **Term End Examinations (TEE)** |
| 2 | 0 | 0 | 0 | Marks Scaled to 50 | --- |

**Pre-requisite: -**

**Course Objective**

The objective of this course is to understand the concept of Design thinking through engaging the students in projects/ assignments that illustrate the various pillars of Design thinking. Imbibe the higher order skill of Design thinking which they will be able to apply in various projects during their course, to create new products & services.

**Course Outcomes**

After completion of the course, students will be able to-

1. Develop a human-centric approach towards problem solving
2. Apply design thinking principles to come up with innovative solutions to problems and challenges

**Detailed Syllabus**

| Unit | Descriptions | Duration |
|---|---|---|
| 1. | **Introduction to Design Thinking**<br>-Design Thinking as 'Experience Innovation'<br>- Concepts of Customer Desirability, Technological Feasibility, Business Viability and their significance | 02 |
| 2. | **Case Study:** Discussion on HBR article Design Thinking by Tim Brown (Pre-Read based analysis of all four case studies covered in article) | 02 |
| 3. | **Mindset Creation**<br>- Growth Mindset vs. Fixed Mindset<br>- Essential elements of Design Thinking Mindset<br>- Case Study: Jeff Bezos-Amazon's approach of being Customer Obsessed | 02 |
| 4. | - Pillars of Design Thinking | 02 |


(Prepared by Corned Faculty/HOD)

| | | |
|---|---|---|
| | - Introduction to Stages of Design Thinking based on Stanford d. School | |
| 5. | **Case Study for Application of Design Thinking**<br>IDEO Shopping Cart (Case Video followed by debrief/class discussion) | 02 |
| 6. | **Empathy [A]**<br>-Introduction to empathy | 02 |
| | -Decoding Customer Behaviour using DT (using case study method) | |
| 7. | **Empathy [B]**<br>-Tools:Understanding Consumer's Unmet Needs & Pain Points:<br>(Observation, Focused Interviews, Shadowing, Journey Mapping)<br>- Rules and tips for each specific tool<br>(Class activity based learning for each<br>tool) | 04 |
| 8. | **Empathy [C]**<br>Debrief of Class Activity for Journey Mapping<br>Empathy Case Study: 'Embrace- Infant Incubator' | 02 |
| 9. | **Define**<br>-Analysis of data gathered from Empathy stage through tools like Clustering & Affinity Diagrams<br>-Building Problem Statements & understanding POV<br>-Tools: Framing problems as 'How Might We?' questions | 02 |
| 10. | **Ideate**<br>-Concept of Semi-structured approach to Ideation in DT<br>-Rules of Ideation<br>-Tools: Brainstorming, Brainwriting, Dot Voting | 02 |
| 11. | **Ideate**<br>-Class Activity to demonstrate Brainstorming & Dot Voting<br>- Case Study for Out of the Box Idea Generation: Steelcase | 02 |
| 12. | **Prototype**<br>-Introduction to concept of prototyping & basic techniques of rapid prototyping<br>-Introduction to Low fidelity vs. High fidelity prototypes and their significance in the Design Thinking process -General information on user testing & MVPs<br>- Case Study for Prototyping & User Testing: Nordstorm Innovation Lab | 02 |

Mukesh Patel School of Tech. Mgmt. & Engg. SVKM'S NMIMS Mumbai 56

(Prepared by Corned Faculty/HOD)

| | | |
|---|---|---|
| 13. | **Term End Group Project**<br>Analysis of Design Thinking success stories from across various domains – Students are expected to build a presentation based on the design thinking led success story of their chosen company/organization | 04 |
| | **Total** | **30** |

**Textbook and Reference Books**

1. Idris Mootee , Design Thinking for Strategic Innovation, Wily, 2014.

(Prepared by Corned Faculty/HOD)