# MASTER OF COMPUTER APPLICATION (MCA)
## CURRICULUM 2013

### SEMESTER - I

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>DMC7101</td>
<td>Mathematical Foundations of Computer Science</td>
<td>4</td>
</tr>
<tr>
<td>DMC7102</td>
<td>Problem Solving and Programming</td>
<td>3</td>
</tr>
<tr>
<td>DMC7103</td>
<td>Database Management System</td>
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<tr>
<td>DMC7104</td>
<td>Software Engineering</td>
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<tr>
<td>DMC7105</td>
<td>Computer Organization &amp; Design</td>
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**Practical**

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<tbody>
<tr>
<td>DMC7111</td>
<td>Programming Lab</td>
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<tr>
<td>DMC7112</td>
<td>Database Management System Lab</td>
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**Total** 20

### SEMESTER - II

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<tr>
<td>DMC7201</td>
<td>Computer Networks</td>
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<tr>
<td>DMC7202</td>
<td>Operating System</td>
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<tr>
<td>DMC7203</td>
<td>Data Structures and Algorithms</td>
<td>3</td>
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<tr>
<td>DMC7204</td>
<td>Computer Graphics and Multimedia Systems</td>
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<tr>
<td>DMC7205</td>
<td>Object Oriented Programming</td>
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**Practical**

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<tr>
<td>DMC7211</td>
<td>Data Structures using C++ Lab</td>
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**Total** 19

### SEMESTER - III

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<tr>
<td>DMC7302</td>
<td>Data Warehousing and Mining</td>
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<td>DMC7303</td>
<td>Object Oriented Analysis and Design</td>
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<td>DMC7304</td>
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<tr>
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<tr>
<td>DMC7401</td>
<td>Unix and Network Programming</td>
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<tr>
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<tr>
<td>DMC7403</td>
<td>.NET Programming</td>
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<td>E2</td>
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### SEMESTER - V

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<td>DMC7502</td>
<td>Software Project Management</td>
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<td>DMC7503</td>
<td>Mobile Application Development</td>
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<td>DMC7504</td>
<td>Communication Skills</td>
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### SEMESTER - VI

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# LIST OF ELECTIVES

## III SEMESTER – ELECTIVE I

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<thead>
<tr>
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<tr>
<td>DMC7001</td>
<td>Advanced Databases</td>
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<tr>
<td>DMC7002</td>
<td>TCP/IP Protocol Suite</td>
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<tr>
<td>DMC7003</td>
<td>Software Testing</td>
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## IV SEMESTER – ELECTIVE II

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<td>DMC7004</td>
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<td>DMC7005</td>
<td>Artificial Intelligence</td>
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<tr>
<td>DMC7006</td>
<td>Human Resource Management</td>
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## IV SEMESTER – ELECTIVE III

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<tr>
<td>DMC7008</td>
<td>E-Learning Management</td>
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<tr>
<td>DMC7009</td>
<td>Collaborative Web Design</td>
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## V SEMESTER – ELECTIVE IV

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<td>DMC7010</td>
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<tr>
<td>DMC7011</td>
<td>Game Programming</td>
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<tr>
<td>DMC7012</td>
<td>Free / Open Source Software</td>
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## VI SEMESTER MCA – ELECTIVE V

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<td>DMC7013</td>
<td>Enterprise Resource Planning</td>
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<tr>
<td>DMC7014</td>
<td>Resource Management Techniques</td>
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<tr>
<td>DMC7015</td>
<td>Technology Commercialization &amp; Transfer</td>
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COURSE OBJECTIVES

Introduce mathematical logic, combinatorial and counting techniques, Algebraic structures, Finite state system and grammar as Mathematical Foundation of computer Science so as to understand algorithms, computability and other theoretical aspects of Computer science.

COURSE OUTCOMES

Upon completion of the course, the students should be able to

- Understand mathematical logic and to develop analytical solutions for logical problems and they will be equipped with counting techniques to solve combinatorial problems.
- Comprehend the algebraic structure and formal languages with their applications to handle abstract generalizations and computability.


UNIT II COMBINATORICS - Permutations and Combinations - Mathematical Induction - Pigeonhole principle - Principle of Inclusion and Exclusion - Recurrence relations - Solution by generating functions and characteristics equations.

UNIT III ALGEBRAIC STRUCTURES - Groups - Cyclic group - Permutation group (Sn and Dn) - Substructures - Homomorphism - Cosets and Lagrange’s Theorem - Normal Subgroups - Rings and Fields (definition and examples).

UNIT IV LATTICES - Partial order relation – Posets - Hasse diagram - Lattices - Special Lattices - Boolean Algebra.

UNIT V FINITE STATE AUTOMATA AND GRAMMARS - Finite state automata - Deterministic and non-deterministic model - languages accepted by Finite State Automata - Regular expressions - Context-free grammars - Derivation trees.
REFERENCE BOOKS:

DMC 7102 PROBLEM SOLVING AND PROGRAMMING CREDITS: 3

COURSE OBJECTIVES

- Understand the various problem solving techniques.
- To be aware of the top down design technique.
- To learn the syntax of C.
- To be exposed to the file processing techniques of C.
- To be familiarized with the preprocessor directives.

COURSE OUTCOMES

Upon completion of the course, the students should be able to

- Design and implement C programs for any given problem.
- Work with existing programs and modify it as per the requirements.
- Identify the errors in a C program.
- Identify the output of a C program without actually executing it.


UNIT V  STREAMS, FILES AND PREPROCESSOR - Streams – Formatting Output
with printf – Formatting Input with scanf. Files – Sequential-Access Files-
Creation – Reading –Random-Access Files – Creation – Reading. C Preprocessor
– Introduction- #include - #define – Symbolic Constants- Macros- Conditional
Compilation - #error - #pragma – Operators # and ## - Line Numbers –
Predefined Symbolic Constants.

REFERENCE BOOKS:

   2002
COURSE OBJECTIVES

- Learn the fundamentals of data models and to conceptualize and depict a database system using ER diagram.
- To make a study of SQL and relational database design.
- Understand the internal storage structures using different file and indexing techniques which will help in physical DB design.
- Know the fundamental concepts of transaction processing- concurrency control techniques and recovery procedure.
- Gain a fundamental knowledge about the Storage and Query processing Techniques.

COURSE OUTCOMES

Upon completion of the course, the students should be able to

- Design and create tables in database and query them.
- Know how transaction processing is done.
- Analyze and appraise different types of databases.


UNIT V ADVANCED TOPICS - Distributed Databases-Architecture-Transaction Processing-Data Warehousing and Mining-Classification-Association rules-Clustering-Information Retrieval- Relevance ranking-Crawling and Indexing the Web- Object Oriented Databases-XML Databases.

REFERENCE BOOKS:

COURSE OBJECTIVES

- To provide information about wider engineering issues that form the background to develop complex, evolving (software-intensive) systems.
- To plan a software engineering process to account for quality issues and non-functional requirements.
- To employ a selection of concepts and techniques to complete a small-scale analysis and design in mini projects.
- To impart knowledge to translate requirement specifications into a design, and then realize that design practically, all using an appropriate software engineering methodology.
- To provide basic knowledge about software project management.

COURSE OUTCOMES

Upon completion of the course, the students should be able to

- Familiar with basic concepts of Software design and implementation
- Perform software testing on various applications
- Understand and apply various software metrics on software quality products


REFERENCE BOOKS:

COURSE OBJECTIVES

- Understand the fundamentals of Boolean logic and functions.
- To have a thorough understanding of the basic structure and operation of a digital computer.
- Design and realize digital systems with basic gates and other components using combinational and sequential circuits.
- To discuss in detail the operation of the arithmetic and logic unit.
- Study the instruction sets and operation of a processor.
- 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.

COURSE OUTCOMES

Upon Completion of the course, the students should be able to:

- Master the binary and hexadecimal number systems including computer arithmetic.
- Design and implement digital systems with basic gates and other components using combinational and sequential circuits.
- Be familiar with the Von Neumann architecture.
- Be familiar with the functional units of the processor and addressing modes, instruction sets.
- Be familiar with the memories and cache subsystem.
- Be familiar with different ways of communicating with I/O devices and standard I/O interfaces.

UNIT I  DIGITAL FUNDAMENTALS - Digital systems, binary numbers, octal, hexadecimal conversions, signed binary numbers, complements, logic gates, Boolean algebra, K-maps, standard forms, NAND-NOR implementation.

UNIT II  COMBINATIONAL AND SEQUENTIAL CIRCUITS - Combinational circuits, adder, subtractor, ALU design, decoder, encoder, multiplexers, Sequential circuits: latches, flip-flops, registers, memories, up-down counters.

UNIT III  PROCESSOR FUNDAMENTALS - Von-neumann architecture, processor: definition, structure, category, technology, ALU concept, stored programs, fetch execute cycle, instruction formats, clock rate instruction rate, pipeline, current processors, multi core processors.

UNIT IV  MEMORY - Physical memory, addressing, virtual memory, address translation, paging, cache, L1,L2,L3 cache memories, cache mapping, LRU replacement.
UNIT V  I/O DATA TRANSFER - Data transfer, Serial and Parallel data transfer, Full duplex- half duplex interaction, Bus interface, Programmed I/O, Polling, Interrupt driven I/O, Hardware interrupt mechanism, Interrupt vectors, Multi level of interrupts, DMA, buffer chaining, operation chaining,

REFERENCE BOOKS:

COURSE OBJECTIVES

- To practice the syntax of C.
- To be exposed to the file processing techniques of C.
- To be familiarized with control structures, functions, arrays and files.

COURSE OUTCOMES

Upon Completion of the course, the students should be able to:

- Design and implement C programs for any given problem.
- Understand an existing program and modify it as per the requirements.
- Identify the errors in a C program.
- Produce the output of a C program by actually executing it.

EXPERIMENTS IN THE FOLLOWING TOPICS:

- Non-iterative control structures.
- Iterative control structures and arrays.
- Functions with parameters.
- Functions with arrays, structures as arguments.
- Character and String handling Libraries.
- Files – Sequential access and random access.
- Preprocessor directives for other features like macros, conditional compilation.
COURSE OBJECTIVES

- Understand the concepts of DBMS practically.
- To familiarize with SQL queries.
- To write stored procedures in DBMS.
- Learn front end tools and to integrate them with databases.

COURSE OUTCOMES

Upon Completion of the course, the students should be able to:

- Design and Implement databases practically.
- Formulate complex queries using SQL and execute them.
- Design and Implement applications that have GUI and access databases for backend connectivity.

EXPERIMENTS IN THE FOLLOWING TOPICS:

- Data Definition, Manipulation of Tables and Views
- Database Querying – Simple queries, Nested queries, Sub queries and Joins
- Triggers
- Transaction Control
- Embedded SQL
- Database Connectivity with Front End Tools
- Front End Tools / Programming Languages
- High level language extensions - PL/SQL Basics
- Procedures and Functions
- Database Design and Implementation (Case Study)
SEMESTER – II

DMC 7201 COMPUTER NETWORKS CREDITS: 3

COURSE OBJECTIVES

- Understand data communication techniques.
- To know network Fundamentals.
- Understand Network layers and its functionalities.

COURSE OUTCOMES

Upon Completion of the course, the students should be able to:

- Trace the flow of information from one node to another node in the network.
- Identify the component required to build different types of networks.
- Understand the division of network functionalities into layers.
- Identify solution for each functionality at each layer.
- Choose the required functionality at each layer for given application.


REFERENCES

COURSE OBJECTIVES

- Learn the Operating System basics.
- Study the process management of Operating system.
- Gain knowledge in the storage management and I/O systems of Operating system.

COURSE OUTCOMES

Upon Completion of the course, the students should be able to:

- Ability to discuss on the basics of OS.
- In depth knowledge in process management, memory management and I/O Management of various operating systems.
- To explore the case studies with various operating systems.

UNIT I OPERATING SYSTEMS OVERVIEW

UNIT II PROCESS MANAGEMENT

UNIT III STORAGE MANAGEMENT

UNIT IV I/O SYSTEMS

UNIT V CASE STUDY
REFERENCE BOOKS:

DMC 7203  DATA STRUCTURES AND ALGORITHMS  CREDITS: 3

COURSE OBJECTIVES

- Gain comprehensive introduction of common data structures, and algorithm design and analysis.
- To master the design of tree, sets and graph structures and its applications.
- Learn about sorting techniques and understand how common computational problems can be solved efficiently on a computer.

COURSE OUTCOMES

Upon Completion of the course, the students should be able to:

- Describe, explain, and use abstract data types including stacks, queues and lists.
- Design and Implement Tree data structures and Sets.
- Design algorithms using graph structure to solve real-life problems.
- Implement a variety of algorithms for sorting, including insertion sort, selection sort, merge sort, quick sort, and heap sort.
- Describe the asymptotic performance and algorithm design techniques studied in this course and understand the practical implications of that information.

UNIT I  BASIC DATA STRUCTURES - From Problems to programs - Abstract Data Types - Data Types, Data Structures, and Abstract Data Types - The Running Time of a program - Calculating the Running Time of a program - Good Programming Practice; Basic Data Types: The Data Type “List” - Implementation of Lists – Stacks – Queues – Mappings - Stacks and Recursive Procedures.


REFERENCE BOOKS:

COURSE OBJECTIVES

- Understand the basic concepts of graphics designs.
- To familiarize the student with the transformation and projection techniques.
- Expose the student to various color models.

COURSE OUTCOMES

Upon Completion of the course, the students should be able to

- Implement basic graphics transformation and projection techniques.
- Design an application that incorporates different concepts of various color models.
- Apply and explore new techniques in the areas of compression techniques.
- Appreciate the use of multimedia authoring tools and multimedia compression techniques.


UNIT II 2D TRANSFORMATIONS - Two dimensional transformations – Scaling and Rotations - Interactive Input methods - Polygons - Splines – Bezier Curves - Window view port mapping transformation.


REFERENCE BOOKS:

DMC 7205

OBJECT ORIENTED PROGRAMMING

CREDITS: 3

COURSE OBJECTIVES

- Understand the OO paradigm.
- To be aware of the OO design technique.
- To learn the syntax of C++.
- To be exposed to the file processing and exception handling techniques of C++.
- To be familiarized with the Standard Template Library.

COURSE OUTCOMES

Upon Completion of the course, the students should be able to:

- Design and implement C++ programs for any given problem.
- Understand an existing program and modify it as per the requirements.
- Identify the errors in a C++ program.
- Identify the output of a C++ program without actually executing it.
- Write generic programs using STL.


UNIT II  IMPLEMENTING ADTS AND ENCAPSULATION - Aggregate Type struct – Structure Pointer Operators – Unions – Bit Fields – Data Handling and Member Functions – Classes – Constructors and Destructors – Static Member – this Pointer – reference semantics – implementation of simple ADTs.


REFERENCE BOOKS:

COURSE OBJECTIVES

- Develop skills in design and implementation of data structures and their applications.
- Learn and implement linear, non linear and tree data structures using C++
- Learn Set ADT and Graph data structures and its applications using C++.
- Study, implement and analyze of different sorting techniques using C++.

COURSE OUTCOMES

Upon Completion of the course, the students should be able to:

- Work with basic data structures that are suitable for problems to be solved efficiently.
- Implementation of linear, tree, and graph structures and its applications.
- Implementation of various sorting techniques its algorithm design and analysis.

EXPERIMENTS IN THE FOLLOWING TOPICS:

- Abstract Data type Implementation of List, Stack and Queues.
- Tree ADT
- Tries Implementation
- Set ADT- Bit Vector Implementation
- Graph Representations
- Graph Traversals
- Shortest Path Implementation
- Spanning Tree Implementation
- Sorting Algorithms
- Implementation of Algorithms using Dynamic Programming, Backtracking
COURSE OBJECTIVES

- To learn and understand the CPU scheduling algorithms.
- To learn and understand the implementation of memory management algorithm.
- To know the file management techniques practically.

COURSE OUTCOMES

- To implement the CPU scheduling methods.
- To implement the inter process communication techniques.
- To implement the page replacement algorithm.

EXPERIMENTS IN THE FOLLOWING TOPICS:

- Implement the following CPU Scheduling Algorithms.
  - i) FCFS  
  - ii) Round Robin  
  - iii) Shortest Job First.
- Implement the Mutual Exclusion Problem Using Dekker’s Algorithm.
- Implement Inter Process Communication Problem (Producer-Consumer /Reader- Writer Problem) Using Semaphores.
- Implement Best fit, First Fit Algorithm for Memory Management.
- Implement Memory Allocation with Pages.
- Implement FIFO page Replacement Algorithm.
- Implement LRU page Replacement Algorithm.
- Implement the creation of Shared memory Segment.
- Implement File Locking.
- Implement Banker’s algorithm.
SEMESTER - III

DMC7301 SECURITY PRACTICE CREDITS: 3

COURSE OBJECTIVES

- Understand the concepts and models of security in computing.
- Understand the cryptographic techniques used.
- Explain the security standards followed at the network level and at the application level.
- Estimate the level of security risk faced by an organization and the counter measures to handle the risk.
- Learn secured software development.

COURSE OUTCOMES

Upon Completion of the course, the students should be able to:

- Compare various Cryptographic Techniques.
- Design Secure applications.
- Inject secure coding in the developed applications.


UNIT IV HOST AND DATA SECURITY- Host Hardening – OS hardening – managing vulnerabilities, permissions - data protection – Application security – issues – e-commerce security – e-mail security - Incident and Disaster Response.


REFERENCE BOOKS:

COURSE OBJECTIVES

- Understand Data mining principles and techniques and Introduce DM as a cutting edge business intelligence.
- Expose the students to the concepts of Datawarehousing Architecture and Implementation.
- Study the overview of developing areas – Web mining, Text mining and ethical aspects of Data mining.
- Identify Business applications and Trends of Data mining.

COURSE OUTCOMES

Upon Completion of the course, the students will be able to

- Evolve Multidimensional Intelligent model from typical system
- Discover the knowledge imbibed in the high dimensional system
- Evaluate various mining techniques on complex data objects


UNIT II DATA MINING & DATA PREPROCESSING - Introduction to KDD process – Knowledge Discovery from Databases - Need for Data Preprocessing – Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization and Concept Hierarchy Generation.

UNIT III ASSOCIATION RULE MINING - Introduction - Data Mining Functionalities - Association Rule Mining - Mining Frequent Itemsets with and without Candidate Generation - Mining Various Kinds of Association Rules - Constraint-Based Association Mining.

UNIT IV CLASSIFICATION & PREDICTION - Classification vs Prediction – Data preparation for Classification and Prediction – Classification by Decision Tree Introduction – Bayesian Classification – Rule Based Classification – Classification by Back propagation – Support Vector Machines – Associative Classification – Lazy Learners – Other Classification Methods – Prediction – Accuracy and Error Measures – Evaluating the Accuracy of a Classifier or Predictor – Ensemble Methods – Model Section.

REFERENCE BOOKS:

DMC7303  OBJECT ORIENTED ANALYSIS AND DESIGN  CREDITS: 3

COURSE OBJECTIVES

- Understand the basics of object oriented analysis and design.
- Learn UML models and tools.
- To apply design patterns to various applications.

COURSE OUTCOMES

Upon Completion of the course, the students should be able to:

- Familiarize with the topics of object oriented System designs.
- Design patterns using UML.
- Apply design patterns to various applications.


REFERENCE BOOKS:

COURSE OBJECTIVES

- Understand the basics of HTML.
- Learn the concepts of XML related technologies.
- Learn the fundamentals of Java.
- Understand the importance of server side programming and web development.

COURSE OUTCOMES

Upon Completion of the course, the students should be able to:

- Design and implementation of web forms and client side validation.
- XML authoring, Parsing, and related technologies.
- Object oriented concept programming using Java.
- Design and development of GUI based applications using Swing components.
- Design and development of servlet and JSP application with database connectivity.


UNIT IV JAVA GUI AND DATABASE CONNECTIVITY - Generic classes – Generic methods – Applets – Applet life cycle methods – Applets based GUI – GUI components – Basic of Swings – Accessing database with JDBC - basics


REFERENCE BOOKS:

COURSE OBJECTIVES

- To learn web page creation.
- To understand the real time requirements of web page such as validation, use of DOM, role of XML.
- To understand OOP concepts and basics of Java language.
- To learn and use client server architecture based applications.
- To explore server side functionalities of an application.

COURSE OUTCOMES

Upon Completion of the course, the students should be able to:

- Make Web site creation and validation.
- Work with XML based technologies.
- Develop simple console application using Java.
- Develop GUI application using Swing and Applet.
- Build web based applications using JDBC, Servlet / JSP.

EXPERIMENTS IN THE FOLLOWING TOPICS:

- Creation of web pages having dynamic contents and validation using java script.
- Creation of XML file and validation using XML schema and generation of XML using tools.
- Simple xml based applications using DOM, SAX and XSL.
- Basic Java programming covering objects, inheritance, polymorphism, interfaces, packages and exception handling.
- String handling programs and regular expression programs.
- Creation of applet based GUI’s.
- Application involving applet based GUI, JDBC, Servlet, JSP, cookies and session tracking.
COURSE OBJECTIVES

- Understand the application number theory in security.
- Study the symmetric key and public key algorithms.
- Understand the compression techniques for security.

COURSE OUTCOMES

- Able to implement program using modules arithmetic for security.
- To implement symmetric key and public key algorithm.
- Ability to implement algorithms for digital signature and hashing.

EXPERIMENTS IN THE FOLLOWING TOPICS:

1. Write programs to implement the following number theory concept
   Prime and Relatively Prime Numbers
   Arithmetic Modulo 8 and Multiplication Modulo 8
   Fermat's Theorem and Euler's Totient Function
2. Write programs to implement the following cryptography algorithms
   Playfair cipher and Hill cipher
   Simplified DES algorithm
   RSA algorithm
3. Write programs to implement the following hash a
   MD5
   SHA-1
4. Write programs to implement the following Authentication
   Digital Signature and Digital Certificate
   Kerberos System
   X.509
5. Write a program to implement Hacking windows.
   BIOS Passwords.
   Windows login password
   Internet explorer users
   Changing windows visuals
   Accessing restricted drives.
SEMESTER - IV

DMC 7401      UNIX AND NETWORK PROGRAMMING      CREDITS: 3

COURSE OBJECTIVES

- To understand the design of the Unix operating system using system calls.
- Familiarize with the various inter process communication.
- To learn the various low-level algorithms for socket programming used in UNIX.

COURSE OUTCOMES

- Ability to develop the application using system calls.
- Able to write programs for UNIX networking.
- Able to write programs for communication applications.


UNIT V       APPLICATIONS - Debugging techniques - TCP echo client server - UDP echo client server - Ping - Trace route - Client server applications like file transfer and chat.

REFERENCE BOOKS:

COURSE OBJECTIVES

- To understand the J2EE, J2SE and J2ME concepts.
- Familiarize with java networking and RMI.
- To learn about CORBA and web services.

COURSE OUTCOMES

- To develop the application with JAVA networking and RMI features.
- To implement the database connectivity.
- Creation of web services.

UNIT I  BASIC CONCEPTS - Distributed and Enterprise Systems- Variants on Java platform (J2EE, J2SE, J2ME)-Enterprise Systems Architecture-J2EE model architectures

UNIT II  JAVA NETWORKING AND RMI - Input / output Streams – Java Networking – UDP and TCP Sockets - Java Remote Method Invocation – STUB and Skeleton

UNIT III  CORBA AND JDBC - Introduction to CORBA – CORBA Environment – Database Connectivity – JDBC – JDBC with Servlets and JSP.


REFERENCE BOOKS:

COURSE OBJECTIVES

- To understand the control structures in C#.
- To become familiar with event handling.
- To study the .NET features.

COURSE OUTCOMES

- Able to write the programs in C#.
- Write programs for database access.
- Develop web applications using .NET.

UNIT I C# and the .NET framework – C# basics – Objects and types – Inheritance – Arrays – Operators and casts – Indexers.

UNIT II Delegates and events – Strings and regular expressions – Generics – Collections – Memory management and pointers – Errors and exceptions.


UNIT IV Window based applications – Data access with .NET – basics of ASP .NET - Introduction to web services.


REFERENCE BOOKS:

COURSE OBJECTIVES

- To learn about HTML and CSS programming.
- To understand XML schema and programs for client side validation using Javascript.
- Familiarize with server side programs.

COURSE OUTCOMES

- Ability to develop client/server application.
- Create web services using HTML and XML programming.
- Ability to write programs for database connectivity.

EXPERIMENTS IN THE FOLLOWING TOPICS:

- Web programming with HTML tags, CSS for styling, Page layout
- Develop web pages using JavaScript for client side programming and HTML forms
  Using The DOM and the JavaScript object models
- Website optimization crunching HTML, using CSS to replace HTML and light-weight graphics to speed up websites
- Creating XML file with XML DTD and XML schema, SAX, XSL
- Constructing dynamic server-side web pages using JSF and integrate the Web application with many of the other Java2 Enterprise Edition application server methodologies such as Enterprise Java Beans, JavaMail, and SOAP.
- Developing Java Enterprise Applications Using EJB3 Session beans, entity beans and message-driven beans.
- Working with JNDI, JDBC, JMS.
- Application development using J2ME.
COURSE OBJECTIVES

- Understand the control structures in C#.
- To become familiar with event handling and XML scripts.
- Learn database connectivity and web services in .NET.

COURSE OUTCOMES

- Ability to write programs for client/server application
- Develop the web applications using .NET.
- Ability to create web services using .NET.

EXPERIMENTS IN THE FOLLOWING TOPICS:

- Control Structures in C#
- Arrays an pointers
- XML Scripts.
- Asp/ VB .NET programs for client/server applications.
- Database Connectivity.
- Web services application.
SEMESTER - V

DMC7501 WEB SERVICES CREDITS: 3

COURSE OBJECTIVES

- Learn the basics of XML technology.
- Understand the background of distributed information system.
- Learn the security features of web services and service composition.

COURSE OUTCOMES

The student should be able to

- Create, validate, parse, and transform XML documents.
- Design a middleware solution based application.
- Develop web services using different technologies.
- Compose set of complex web services.


REFERENCES

DMC 7502 SOFTWARE PROJECT MANAGEMENT CREDITS: 3

COURSE OBJECTIVES

- Understand the cost evaluation techniques.
- Learn the concepts of project planning and monitoring.
- Understand the concepts of organizing teams for software projects.

COURSE OUTCOMES

- To perform planning and scheduling activities.
- Ability to draw activity network.
- Ability to manage people and project.

UNIT I INTRODUCTION TO SOFTWARE PROJECT MANAGEMENT - Project Definition – Contract Management – Activities Covered By Software Project Management – Overview of Project Planning – Stepwise Project Planning.


REFERENCE BOOKS:

COURSE OBJECTIVES

- To learn the characteristics of mobile applications.
- Understand the intricacies of UI required by mobile applications.
- To study about the design aspects of mobile application.
- To learn development and programming of mobile applications.

COURSE OUTCOMES

Upon Completion of the course, the students should be able to:

- To design and implement the user interfaces of mobile applications.
- To design the mobile applications that is aware of the resource constraints of the mobile devices.
- To develop advanced mobile applications that accesses the databases and the web.
- To develop useful mobile applications in the current scenario using Google Android and Eclipse simulator.


UNIT II  USER INTERFACE - Generic UI Development – VUIs and Mobile Applications – Text to Speech techniques – Designing the right UI – Multimodal and Multichannel UI – Gesture based UIs – Screen Elements and Layouts – Voice XML – Java API.


REFERENCE BOOKS:

DMC 7504 COMMUNICATION SKILLS CREDITS: 3

COURSE OBJECTIVE

To understand how communication works, and to manage the assumptions more effectively. Helps students communicate effectively, appropriately and clearly in all situations.

COURSE OUTCOME

Students will be able to identify barriers to effective communication and how to overcome them.

UNIT I COMMUNICATION IN BUSINESS - Systems approach - forms - functions and principles of communication - management and communication - communication patterns - barriers to communication - interpersonal perception – SWOT analysis - Johari Window - Transactional Analysis.

UNIT II NON-VERBAL AND INTERCULTURAL COMMUNICATION - Importance of non-verbal communication - personal appearance - facial expressions - movement - posture – gestures - eye contact - voice - beliefs and customs - worldview and attitude.

UNIT III ORAL COMMUNICATION - Listening - types and barriers to listening - speaking - planning and audience awareness - persuasion - goals - motivation and hierarchy of needs - attending and conducting interviews - participating in discussions, debates - and conferences - presentation skills - paralinguistic features - fluency development strategies.


REFERENCE BOOKS:

COURSE OBJECTIVES

- Analyze and design a web service based application.
- Learn the security features of web services and service composition.

COURSE OUTCOMES

- Ability to write programs to Create, validate, parse, and transform XML documents.
- To develop a middleware solution based application.
- To develop web services using different technologies.

EXPERIMENTS IN THE FOLLOWING TOPICS:

- Create an XML file for any domain with multiple sublevel complexity. (Example: Students data, Employee information, Product details etc..)
- Create a DTD and XML schema for the XML file.
- Tabulate the xml content using XSL.
- Validate a XML file using java script with XMLDOM.
- Write a java program to parse an XML file using DOM.
- Write a java program to parse an XML file using SAX.
- Write a program to implement XML – RPC.
- Write a program to implement a web service using java and .NET.
DMC7512  MOBILE APPLICATION DEVELOPMENT  CREDITS: 2
LAB

COURSE OBJECTIVES

- To know about various platforms and tools available for developing mobile applications.
- To realize the differences between developing conventional applications and mobile applications.
- To learn programming skills in J2ME and Android SDK.
- To study about micro browser based applications to access the Internet using Sun Java Toolkit.

COURSE OUTCOMES

Upon Completion of the course, the students should be able to:

- Develop useful mobile applications for the current scenario in mobile computing and pervasive computing.

EXPERIMENTS IN THE FOLLOWING TOPICS:

- Survey of Mobile Application Development Tools.
- Form design for mobile applications.
- Applications using controls.
- Graphical and Multimedia applications.
- Data retrieval applications.
- Networking applications.
- Gaming applications
  - (Perform the experiments from 2 to 7 in J2ME and Android SDK framework)
- Micro browser based applications using WAP, WML and WML scripts
  - (Perform experiments in 8 using Sun Java Wireless toolkit)
SEMESTER - VI

DMC 7601  CLOUD SERVICES  CREDITS: 3

COURSE OBJECTIVES

- Understand the concept of cloud and utility computing.
- To understand the various issues in cloud computing.
- Familiarise themselves with the lead players in cloud.
- To appreciate the emergence of cloud as the next generation computing paradigm.

COURSE OUTCOMES

Upon Completion of the course, the students should be able to:

- Articulate the main concepts, key technologies, strengths and limitations of cloud computing.
- Identify the architecture, infrastructure and delivery models of cloud computing.
- Explain the core issues of cloud computing such as security, privacy and interoperability.
- Choose the appropriate technologies, algorithms and approaches for the related issues.
- To be able to set up a private cloud.


UNIT IV  PROGRAMMING MODEL - Parallel and Distributed programming Paradigms – MapReduce, Twister and Iterative MapReduce – Hadoop Library from Apache – Mapping Applications - Programming Support - Google App Engine, Amazon AWS - Cloud Software Environments - Eucalyptus, Open nebula, OpenStack.

REFERENCE BOOKS:

LIST OF ELECTIVES

DMC 7001  ADVANCED DATABASES  CREDITS: 3

COURSE OBJECTIVES

- Learn the modeling and design of databases.
- Acquire knowledge on parallel and distributed databases and its applications.
- Study the usage and applications of Object Oriented and Intelligent databases.
- Understand the usage of advanced data models.
- To learn emerging databases such as XML, Cloud and Big Data.
- Acquire inquisitive attitude towards research topics in databases.

COURSE OUTCOMES

- Develop in-depth understanding of relational databases and skills to optimize database performance in practice.
- Understand and critique on each type of databases.
- Design faster algorithms in solving practical database problems.
- Implement intelligent databases and various data models.

UNIT I  RELATIONAL DATABASES - Relational Model - Querying - Storage Structures - Query Processing - Normalization.

UNIT II  OBJECT ORIENTED DATABASES - Introduction to Object Oriented Databases - Approaches - Modeling and Design - Persistence - Transaction - Concurrency - Recovery - Database Administration.

UNIT III  EMERGING SYSTEMS - Enhanced Data Models - Client/Server Model - Data Warehousing and Data Mining - Web Databases – Mobile Databases.

UNIT IV  CURRENT ISSUES - Rules - Knowledge Bases - Active and Deductive Databases - Distributed Databases and Parallel databases.

UNIT V  DATABASE DESIGN ISSUES - Security - Integrity - Consistency - Database Tuning - Optimization and Research Issues.

REFERENCE BOOKS:

DMC 7002  TCP/IP PROTOCOL SUITE  CREDITS: 3

COURSE OBJECTIVES

- Understand the interaction between TCP/IP suite and OS.
- To study about the complicated data structures that are used to implement the various protocols.
- Learn about the routing methodologies within AS and across AS.
- Study about the timer management of TCP in detail.
- To learn the implementation of ICMP and IGMP.

COURSE OUTCOMES

At the end of the course the student should be able

- Design a sample protocol stack.
- To come up with more efficient data structures for the protocols.
- To embed the protocol suite in a better and secure way in the OS.
- To come up with the variants of TCP according to the applications.
- To modify IP according to the applications.


REFERENCE BOOKS

COURSE OBJECTIVES

- To introduce the basics and necessity of Software testing.
- To introduce various testing techniques along with software production.
- To introduce the concepts of Software bugs and its impact.

COURSE OUTCOMES

Upon Completion of the course, the students should be able to:

- Perform automated testing using test tools.
- Document the testing procedures.

UNIT I  INTRODUCTION - Software Testing background – software bugs- cost of bugs-
software testing realities- Testing Axioms – Precision and Accuracy-verification
and validation- quality and reliability-testing and quality assurance.

UNIT II  SOFTWARE TESTING METHODOLOGY - Functional testing- Structural
testing – Static and Dynamic testing – low level specification test techniques –
Equivalence Partitioning – Data testing – State Testing – formal reviews – coding
standards and guidelines – code review checklist – data coverage- code coverage.

UNIT III SOFTWARE TESTING TECHNIQUES - Configuration testing –
Compatibility testing – foreign language testing – usability testing – testing the
documentation - testing for software security – website testing.

UNIT IV AUTOMATED TESTING AND TEST TOOLS - Benefits of automation and
tools – viewers and monitors – drivers – stubs – stress and load tools – analysis
tools- software test automation – random testing – beta testing.

UNIT V  TEST DOCUMENTATION - Goal of Test Planning – test phases – test strategy
– resource requirements – test schedule – writing and tracking test cases- Bug
tracking systems – metrics and statistics- risks and issues.

REFERENCE BOOKS:

DMC 7004 DISTRIBUTED SYSTEMS CREDITS: 3

COURSE OBJECTIVES

- Understand the distributed system architectures.
- Know distributed system resource management.
- Understand the various fault tolerant techniques.

COURSE OUTCOMES

Upon Completion of the course, the students should be able to:
- Develop fault tolerant distributed applications.
- Compare various distributed operating system characteristics.
- Apply efficient Resource allocation methodologies in distributed applications.


UNIT V CASE STUDIES - Distributed Object-Based System – CORBA – COM+ – Distributed Coordination-Based System – JINI.

REFERENCE BOOKS:

COURSE OBJECTIVES

- Provide a strong foundation of fundamental concepts in Artificial Intelligence.
- To enable Problem-solving through various searching techniques.
- To enable the student to apply these techniques in applications which involve perception, reasoning and learning.
- To apply AI techniques primarily for machine learning, vision, and robotics.

COURSE OUTCOMES

- Provides a basic exposition to the goals and methods of Artificial Intelligence.
- Study of the design of intelligent computational agents.
- The knowledge acquired through learning can be used both for problem solving and for reasoning.
- Improves problem solving, reasoning, planning, natural language understanding, computer vision, automatic programming and machine learning.


REFERENCE BOOKS:

DMC7006  HUMAN RESOURCE MANAGEMENT    CREDITS: 3

COURSE OBJECTIVES

To provide knowledge about management issues related to staffing, training, performance, compensation, human factors consideration and compliance with human resource requirements.

COURSE OUTCOMES

Students will gain knowledge and skills needed for successful human resources professional.


REFERENCE BOOKS:

DMC 7007 ETHICAL HACKING & CYBER FORENSICS CREDITS: 3

COURSE OBJECTIVES

- To understand the hacking techniques of computer forensics.
- To learn about data recovery methods.
- To identity the threats in computer forensics.

COURSE OUTCOMES

- Able to distinguish between hackers and normal users.
- To apply the principles of computer forensics for security.
- To implement the data recovery methods.
- To manage threats and the tactics.

UNIT I ETHICAL HACKING - Foundation for Ethical Hacking-Ethical Hacking in Motion-Hacking Network Hosts-Hacking Operating Systems-Hacking Applications.


REFERENCE BOOKS:

COURSE OBJECTIVES

- Learn the basics of E-Learning concepts.
- Learn the content development techniques.

COURSE OUTCOMES

- Develop e – learning application on their own.
- Ability to develop contents for e-learning.
- To perform course management using tools.


UNIT III APPLICATIONS - Moodle 2.0 E-Learning Course Development – Features, Architecture, Installation and Configuring Site.

UNIT IV COURSE MANAGEMENT - Creating – Categories, Courses, Adding Static Course Material – Links, Pages, Moodle HTML Editor, Media Files, Interacting with Lessons and Assignments – Evaluating Students – Quizzes and Feedback.

UNIT V ENHANCEMENT - Adding Social Activities - Chat, Forum, Ratings, Blocks – Types, Activities, Courses, HTML, Online Users – Features for Teachers.

REFERENCE BOOKS:

COURSE OBJECTIVES

- Understand JOOMLA and become familiar with Extensions.
- Learn the concept of web applications for group discussion.

COURSE OUTCOMES

- Able to create web content using JOOMLA.
- Able to develop components, web sites and discussion forum.


UNIT IV TEMPLATES - Basics of Joomla Templates – Design Styling and CSS – Customizing the Default Template Beez – Beez color schemes - Adding logo – Create own Joomla template with basic template structure.


REFERENCE BOOKS:

COURSE OBJECTIVES

- Understand Mobile Business strategies.
- To understand Mobile marketing tools and techniques.
- To know Mobile technologies.

COURSE OUTCOMES

Upon Completion of the course, the students should be able to:

- Analyze various mobile marketing strategies.
- Market Mobile based Applications.
- Apply various tools in mobile marketing.

UNIT I  Introduction – Mobile Marketing Campaign, Fortune 500 and Mobile Marketing, consumers engagement with mobile, Terminologies.

UNIT II  Businesses Vs mobile marketing, classic mistakes in mobile marketing, laying foundation for successful mobile marketing campaign, understanding technology behind mobile marketing – Android, iOS, Windows Phone.

UNIT III  Strategic thinking about Mobile marketing campaign, Mobile Marketing Tools – setting up mobile website for different firms, using SMS, MMS and apps to drive customers to business and other ways to attract customers.

UNIT IV  Location Based Marketing: LBS, NFC, Bluetooth and LBA, 2D codes, Tablet, Other Mobile Applications, Business Firms connecting to customers using Mobile – case study, Mobile Marketing for B2B companies, Mobile E-commerce to Drive Revenue.

UNIT V  Mobile Payments, Present and Future Mobile Technology, Mobile Application Development.

REFERENCE BOOKS:

COURSE OBJECTIVES

To get subsequent understanding of game design and development, which includes the processes, mechanics, issues in game design, game engine development, modeling, techniques, handling situations, and logic. At the end, the student will be in a position to create interactive games.

COURSE OUTCOMES

- Ability to design graphics for game programming.
- To implement 3D graphics animation techniques for game programming.


UNIT II GAME DESIGN PRINCIPLES - Character development, Story Telling, Narration, Game Balancing, Core mechanics, Principles of level design, Genres of Games, Collision Detection, Game Logic, Game AI, Path Finding.

UNIT III GAMING ENGINE DESIGN - Renderers, Software Rendering, Hardware Rendering, and Controller based animation, Spatial Sorting, Level of detail, collision detection, standard objects, and physics.

UNIT IV GAMING PLATFORMS AND FRAMEWORKS - Flash, DirectX, OpenGL, Java, Python, XNA with Visual Studio, Mobile Gaming for the Android, iOS, Game engines - Adventure Game Studio, DXStudio, Unity.

UNIT V GAME DEVELOPMENT - Developing 2D and 3D interactive games using OpenGL, DirectX – Isometric and Tile Based Games, Puzzle games, Single Player games, Multi Player games.

REFERENCE BOOKS:

COURSE OBJECTIVES

- Gain the knowledge of FREE / OPEN SOURCE SOFTWARE.
- Learn the concepts of TCP/IP networking and routing, server set up and configuration.
- Summarize the programming tools and basics of X windows server architecture.

COURSE OUTCOMES

- Design and configure the system networking.
- Develop GUI applications for network.
- Configure the different categories of servers.

UNIT I  

UNIT II  
SYSTEM ADMINISTRATION - GNU/Linux OS installation--detect hardware, configure disk partitions & file systems and install a GNU/Linux distribution; Basic shell commands - logging in, listing files, editing files, copying/moving files, viewing file contents, changing file modes and permissions, process management; User and group management, file ownerships and permissions, PAM authentication; Introduction to common system configuration files & log files; Configuring networking, basics of TCP/IP networking and routing, connecting to the Internet (through dialup, DSL, Ethernet, leased line); Configuring additional hardware - sound cards, displays & display cards, network cards, modems, USB drives, CD writers; Understanding the OS boot up process; Performing every day tasks using gnu/Linux -- accessing the Internet, playing music, editing documents and spreadsheets, sending and receiving email, copy files from disks and over the network, playing games, writing CDs; X Window system configuration and utilities--configure X windows, detect display devices; Installing software from source code as well as using binary packages.

UNIT III  
SERVER SETUP AND CONFIGURATION - Setting up email servers--using postfix (SMTP services), courier (IMAP & POP3 services), squirrel mail (web mail services); Setting up web servers --using apache (HTTP services), php (server-side scripting), perl (CGI support); Setting up file services --using samba (file and authentication services for windows networks), using NFS (file services for gnu/Linux/Unix networks); Setting up proxy services --using squid (http/ftp/https proxy services); Setting up printer services -using CUPS (print spooler), foomatic (printer database); Setting up a firewall -Using netfilter and iptables.
UNIT IV  PROGRAMMING TOOLS - Using the GNU Compiler Collection --GNU compiler tools ; the C preprocessor (cpp), the C compiler (gcc) and the C++ compiler (g++), assembler (gas) ; Understanding build systems --constructing make files and using make, using autoconf and autogen to automatically generate make files tailored for different development environments ; Using source code versioning and management tools --using cvs to manage source code revisions, patch & diff ; Understanding the GNU Libc libraries and linker --linking against object archives (.a libraries) and dynamic shared object libraries (.so libraries), generating statically linked binaries and libraries, generating dynamically linked libraries ; Using the GNU debugging tools --gdb to debug programs, graphical debuggers like ddd, memory debugging / profiling libraries mpatrol and valgrind ; Review of common programming practices and guidelines for GNU/Linux and FOSS ; Introduction to Bash, sed & awk scripting.

UNIT V  APPLICATION PROGRAMMING - Basics of the X Windows server architecture ; Qt Programming ; Gtk+ Programming ; Python Programming ; Programming GUI applications with localisation support.

REFERENCE BOOKS:

1. N. B. Venkateswarlu (Ed); Introduction to Linux: Installation and Programming, B S Publishers; 2005.
DMC7013 ENTERPRISE RESOURCE PLANNING CREDITS: 3

COURSE OBJECTIVE

- Become familiarize with ERP process.
- Learn ERP implementation process using information technology.

COURSE OUTCOMES

- Design and Develop ERP applications by using features of ERP tools.


REFERENCE BOOKS:

COURSE OBJECTIVES

- Understand the Linear Programming models.
- To understand assignment and transportation problem.
- To understand the concepts of project scheduling.

COURSE OUTCOMES

- Able to solve optimization problem.
- Able to design project planning methods.
- To use queuing models for network problems.

UNIT I  LINEAR PROGRAMMING MODELS - Mathematical Formulation - Graphical Solution of linear programming models – Simplex method – Artificial variable Techniques- Variants of Simplex method.


UNIT III  INTEGER PROGRAMMING MODELS - Formulation – Gomory’s IPP method – Gomory’s mixed integer method – Branch and bound technique.


UNIT V  QUEUEING MODELS - Characteristics of Queuing Models – Poisson Queues - (M / M / 1) : (FIFO / ∞ /∞), (M / M / 1) : (FIFO / N / ∞), (M / M / C) : (FIFO / ∞ /∞), (M / M / C) : (FIFO / N / ∞) models.

REFERENCE BOOKS:

COURSE OBJECTIVES

- Learn the categories of technology commercialization.
- Understand the concepts of technology Negotiation.
- Gain knowledge about pattern filing and Commercialization.

COURSE OUTCOMES

- Device successful Commercialization process.
- Implementation of Modernization with effective material transfer agreements.
- Register patent and follow up for commercialization.

UNIT I COMMERCIALIZATION PROCESS - Technology as asset - Technology and economical changes - Competitive technology strategic options - Types of commercialization – Commercialization Process.

UNIT II TECHNOLOGY LICENSING - Technology Licensing - Rights of licence holders - Financial terms - documentation - cross licenses - Collaboration and public policy.

UNIT III TECHNOLOGY NEGOTIATION - Technology Negotiation - Preparation and conduct of negotiations - Technology outsourcing - Socio, economic, political, legal and cultural considerations.

UNIT IV TECHNOLOGY PATENTING - Technology patenting - Filing patent applications - Patent classifications - Commercializing patented technology - Arbitration and mediation.

UNIT V TECHNOLOGY DIFFUSION - Technology diffusion - WTO implication on Technology Commercialization – Global trends in technology commercialization.

REFERENCE BOOKS: