

**SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS)**



(Affiliated to Bharathidasan University)
(Accredited with "A" grade by NAAC | An ISO 9001:2015 Certified Institution)
**SUNDARAKKOTTAI, MANNARGUDI – 614 016,
TAMILNADU, INDIA.**

MASTER OF COMPUTER APPLICATIONS COURSE STRUCTURE UNDER CBCS

(For the candidates admitted in the academic year 2021-2022)

ELIGIBILITY: Those who have completed any degree with Mathematics as one of the core subjects in degree or in +2 level.

Sem	Nature of the Course	Title of the Course	Ins. Hrs/ Week	Credit	Exam Hrs	Marks		Total
						Int.	Ext.	
I	Core Course (CC) – I	Programming in Java	5	4	3	25	75	100
	Core Course (CC) – II	Database and Data Mining Concepts	5	4	3	25	75	100
	Core Course (CC) – III	Design and Analysis of Algorithms	5	4	3	25	75	100
	Core Course (CC) – IV	Mathematical Foundations of Computer Science	5	4	3	25	75	100
	Core Practical (CP) – I	Java Programming Lab	3	2	3	40	60	100
	Core Practical (CP)– II	RDBMS and Data Mining Lab	3	2	3	40	60	100
	Elective Course (EC) – I		4	4	3	25	75	100
Total			30	24	-	-	-	700
II	Core Course (CC) – V	Python Programming	5	4	3	25	75	100
	Core Course (CC) – VI	Distributed Technologies using J2EE and Dot NET	5	4	3	25	75	100
	Core Course (CC) – VII	Operating Systems	5	4	3	25	75	100
	Core Course (CC) – VIII	Accounting and Financial Management	5	4	3	25	75	100
	Core Practical (CP) – III	Python Lab	3	2	3	40	60	100
	Core Practical (CP) – IV	Distributed Technologies Lab	3	2	3	40	60	100
	Elective Course (EC) – II		4	4	3	25	75	100
	Extra Disciplinary Courses (EDC) - I*		3	2	3	25	75	100
Total			33	26	-	-	-	800
III	Core Course (CC) –IX		5	4	3	25	75	100
	Core Course (CC) –X		5	4	3	25	75	100
	Core Course (CC) – XI		5	4	3	25	75	100
	Core Course (CC) – XII		5	4	3	25	75	100
	Core Practical (CP) – V		3	2	3	40	60	100
	Core Practical (CP) –VI		3	2	3	40	60	100
	Elective Course (EC) - III		4	4	3	25	75	100
Extra Disciplinary Courses (EDC) - II*		3	2	3	25	75	100	

Sem	Nature of the Course	Title of the Course	Ins. Hrs/ Week	Credit	Exam Hrs	Marks		Total
						Int.	Ext.	
	Industrial Internship Programme (Mandatory)#		-	4	-	-	-	-
	Total		33	30	-	-		800
IV	Core Project		24	10		25	75	100
	Total		24	10	-	-	-	100
			-	-	-	-	-	-
Grand Total			120	90	-	-	-	2400

- # Student submit report of Industrial Internship Programme after completion during summer.
- *EDC courses are offered to other Post Graduate programmes. For MCA programme, EDC courses of other department are offered.

Subject	No. of Courses	Total Credits
Core course	12	48
Core Practical	6	12
Elective Course	3	12
Extra Disciplinary Course	2	4
Project	1	10
Industrial Internship Programme	-	4
Total	24	90

Note:

- | | CIA | ESE |
|--------------|------------|------------|
| 1. Theory | 25 | 75 |
| 2. Practical | 40 | 60 |
3. Separate passing minimum is prescribed for Internal and External marks

FOR THEORY

1. The passing minimum for CIA shall be 40% out of 25 marks [i.e. 10 marks]
2. The passing minimum for ESE shall be 40% out of 75 marks [i.e. 30 marks]
3. The passing minimum not less than 50% in the aggregate

FOR PRACTICAL

1. The passing minimum for CIA shall be 40% out of 40 marks [i.e. 16 marks]
2. The passing minimum for ESE shall be 40% out of 60 marks [i.e. 24 marks]
3. The passing minimum not less than 50% in the aggregate

ELECTIVE COURSES (EC)

S.No.	Semester	Elective Courses (EC) (Any one from the list)
1.	I	Digital Computer Fundamentals/Computer Architecture / Fundamental of Management Information System
2.	II	Probability and Statistics/ Optimization Techniques/ Theory of Computation
3.	III	

EXTRA DISCIPLINARY COURSES (EDC) OFFERED BY THE DEPARTMENT

S.No.	Semester	Extra Disciplinary Courses (EDC) (Any one from the list)
1.	II	Internet of Things/ Web design
2.	III	

QUESTION PAPER PATTERN

MASTER OF COMPUTER APPLICATIONS

(For the candidates admitted in the academic year 2021–2022)

Max. Time: 3 Hours

Max. Marks: 75

SECTION – A (10 x 2 =10 Marks)
Answer ALL questions in Two Sentences Each

- 1. }
- 2. } UNIT I
- 3. }
- 4. } UNIT II
- 5. }
- 6. } UNIT III
- 7. }
- 8. } UNIT IV
- 9. }
- 10. } UNIT V

* Two questions from each unit

SECTION – B (5 x 5 = 25 Marks)
Answer ALL the Questions in Short

- 11. a. }
- (OR)** } UNIT I
- b. }
- 12. a. }
- (OR)** } UNIT II
- b. }
- 13. a. }
- (OR)** } UNIT III
- b. }
- 14. a. }
- (OR)** } UNIT IV
- b. }
- 15. a. }
- (OR)** } UNIT V
- b. }

* One question from each unit, with Internal choice

SECTION – C (3 x 10 = 30 Marks)
Answer any THREE questions in Detail

- 16. UNIT I
- 17. UNIT II
- 18. UNIT III
- 19. UNIT IV
- 20. UNIT V

*One question from each unit

SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS)



SUNDARAKKOTTAI, MANNARGUDI- 614016.

(For the Candidates admitted in the academic year 2021 – 2022)

DEPARTMENT OF COMPUTER APPLICATIONS

MASTER OF COMPUTER APPLICATIONS (MCA)

Semester: I-CC-I: Programming in Java

Ins. Hrs./Week: 5

Course Credit: 4

Course Code: 21PCA101

OBJECTIVES

- To learn about the basis of java programming and Classes, and to understand Inheritance and ExceptionHandling
- To learn the Multithreaded and Collection Classes in java, and to understand Files concept using Input/ OutputStreams
- To able to develop Applet and Application

UNIT- I: Basics of Java, Classes (15 Hours)

An overview of Java – Java Buzzwords- Data Types, Variables and Arrays - Operators – Control Statements- Introducing Classes: Class Fundamentals – Declaring Objects – Introducing Methods – Constructors – The this keyword – Garbage Collection – Overloading Methods – Overloading Constructors - A Closer Look at Argument Passing - Recursion– Understanding static – final – Nested and Innerclasses.

UNIT- II: Inheritance and Exception (15 Hours)

Inheritance: Inheritance Basics – Using super – Method overriding –Dynamic Method Dispatch- Using Abstract Classes - Final with Inheritance- Object class. Packages and Interfaces: Declaring Packages – Access Protection– Importing Packages – Defining, Implementing, Applying Interfaces - Exception Handling: Exception Types –Using try, catch – throw – throws – finally –multiple catch and nested try statements- Creating Userdefined Exception classes.

UNIT- III: Mutithread and Interfaces (15 Hours)

Multithreaded Programming: The Java Thread Model – Creating a Thread –Creating Multiple Threads- Thread Priorities- Synchronization – Interthread communication. String Handling – The Collection Interfaces and Collection Classes: List, Set, Map, Enumeration and Iterator interfaces-ArrayList, LinkedList, Vector, Stack, Properties, HashTable, StringTokenizer, and Date classes.

UNIT- IV: File Processing and Networking (15 Hours)

Files and IO Streams: File – The Byte Streams: InputStream, Output Stream, FileInputStream, FileOutputStream, PushbackInputStream and PrintStream – The Character Streams: Reader, Writer. File Reader and FileWriter – Serialization. Networking- Networking classes and interfaces: InetAddress class - TCP/IP Client and Server sockets– Datagrams – URL and URL Connection classes.

UNIT- V: Applet and Database Connectivity

(15 Hours)

Introduction to Applet class- Applet Architecture- the HTML APPLET tag – Passing parameters to Applets – Event handling: The Delegation Event Model, Event Classes, Event Listener Interfaces - Working with Graphics, Color and Font classes - Understanding Layout managers- Swing Component classes: JApplet, JFrame and JDialog - Text Fields, Buttons, Combo boxes, List, Tabbed and Scroll Panes. Understanding Layout managers. Introduction to JDBC-Application Database Connection-Applet Database connections-internal database connection

Total Lecture Hours- 75

COURSE OUTCOME

Students will be able to

1. Learn about the basis of java programming and Classes
2. Understand Inheritance and Exception Handling
3. Learn the Multithreaded and Collection Classes in java
4. Understand Files concept using Input/output Streams
5. Develop Applet and Application

TEXT BOOK(S)

1. Herbert Schildt. 2019. The Complete Reference Java 2. Eleventh Edition, McGraw-Hill Education Pvt. Ltd., New Delhi.
2. Donald Bales. 2001. Java Programming with Oracle JDBC. First Edition, O'Reilly Media, Newton, USA.

REFERENCE BOOK(S)

1. Herbert Schildt, Joe O' Neil. 2000. Java 2 Programmer's Reference. Tata McGraw Hill Ltd., New Delhi.
2. Ken Arnold, James Gosling, David Holmes. 2007. The Java Programming Language. Third Edition, Pearson Publication.
3. Muthu C. 2006. Essential of Java Programming. Second Edition, Vijay Nicole imprints Private Limited, Chennai.
4. Somasundaram K. 2006. Programming in Java. First Edition, Jaico Publications House, Chennai.
5. Steven Haines. 2001. Java 2 from Scratch. First Edition, Prentice Hall of India, New Delhi.

E-RESOURCES

1. www.HerbSchildt.com
2. <http://learnjavaonline.org>
3. www.Tutorialspoint.com
4. www.ideone.com
5. <https://www.w3schools.com/java/>

SENGAMALA THAYAR EDUCATIONAL TRUST WOMEN'S COLLEGE

(AUTONOMOUS)

SUNDARAKKOTTAI, MANNARGUDI- 614016.

(For the Candidates admitted in the academic year 2021 – 2022)

DEPARTMENT OF COMPUTER APPLICATIONS

MASTER OF COMPUTER APPLICATIONS (MCA)



Semester: I-CC-II: Database and Data Mining Concepts

Ins. Hrs./Week: 5

Course Credit: 4

Course Code: 21PCA102

OBJECTIVES

- To understand the fundamental elements of relational database management systems, and SQL
- To learn the basic concepts of Relational database design, relational data model, entity-relationship model, ER Model and advanced SQL and improve the database design by normalization and to learn about object oriented databases
- To understand Data mining concepts and to learn about classification and cluster analysis

UNIT- I: Introduction to Database and SQL (15 Hours)

Introduction – Purpose of Database Systems – View of Data-Data Model-Data Base Languages – Data Storage And Querying – Database Users –Relational Databases: Introduction of Relational Model – Structure of Relational Model – Database Schema – Keys – Relational Query Languages – Relational Operations – SQL: SQL query Language –SQL Data Definition –Basic Structure of SQL Query – Additional basic operations –set operations –Aggregate operations –Nested Sub Queries – modification of the database –Intermediate SQL: Join Expression – Views – Integrity Constraints – SQL Data Types and Schemas – Authorization.

UNIT- II:Advanced SQL and Database Design (15 Hours)

Advanced SQL: Accessing SQL for a Programming Languages –functions and procedures-triggers-recursive queries – OLAP –Database Design: Overview of Design Process – Entity Relationship Model – Constraints – ER Diagrams –Relational Data base Design: Features of Good Relational Designs – Atomic Domains and First Normal Form –Functional Dependencies – Multi Value Dependency – More Normal Forms – Comparison of ER model and Relational model.

UNIT- III: Advanced Databases (15 Hours)

Object Based Databases – Overview-Complex Data Types –Structured Types and Inheritance in SQL – Table Inheritance –Array and Multi Sets in SQL –Object Identity and Reference Types in SQL – implementing O-R Features – Object Relational Mapping –Object Oriented Versus ObjectDistributed– Databases:Homogeneous and Heterogeneous Databases – Distributed Data Storage – Distributed Transaction – Distributed Query Processing –Cloud Based Databases.

UNIT-IV:Introduction to Data Mining (15 Hours)

Introduction to data mining: What is data mining?– Why data mining now? – the data mining process software development approach – the CRISP-DM approach – data mining applications –data mining techniques – limitations of data mining – Association Rule Mining: basics – the task and a naïve algorithm – The Apriori algorithm – Direct hashing and Pruning –Dynamic itemset counting.

UNIT- V:Classification and Cluster Analysis (15 Hours)

Decision tree – building decision tree –split algorithm based on information theory – split algorithm based on the Gini index-over fitting and pruning – decision tree rules – naive based method –estimating predictive accuracy of classification methods –improving accuracy of classification methods –other evaluation criteria for classification methods – classification software – Desired features of cluster analysis –types of cluster analysis methods –partitional methods –hierarchical methods –density based methods –dealing with large databases – quality and validity of cluster analysis methods – cluster analysis software.

Total Lecture Hours- 75**COURSE OUTCOME**

Students will be able to

1. Understand the fundamental elements of relational database management systems, and SQL
2. Learn the basic concepts of Relational database design, relational data model, entity-relationship model, advanced SQL and improve the database design by normalization.
3. Learn about the object oriented database
4. Understand data mining concepts
5. Learn about classification and clustering analysis

TEXT BOOK(S)

1. Gupta G K.2014. Introduction to Data mining with Case Studies.Third Edition, Prentice Hall India, New Delhi.
2. Henry F Korth, Abraham Silberschatz,Sudarshan.2010.Database System Concepts. Sixth Edition, McGraw Hill Education, New Delhi.

REFERENCE BOOK(S)

1. Alexis Leon, Mathews Leon. 1999. Database Management system. Leon Press, Chennai and Vikas publishing house Pvt. Ltd., New Delhi.
2. ElmasriRamez, NavatheShamkant. 2017. Fundamentals of Database System.Seventh Edition, Pearson Education, London, UK.
3. Hector Garcia Molina, Jeffrey D Ullman, Jennifer Wisdom. 2013. Database Systems: The Complete Book. Second Edition, Pearson Education, London, UK.
4. Mohammed J Zaki, Wagner Meira J R. 2020. Data mining and Analysis: Fundamental Concepts and Algorithms.Second Edition, Cambridge University Press, USA.
5. Bipin C. Desai. 1991. An Introduction to database systems. First Edition, Galgotia Publications Private Limited, New Delhi.

E-RESOURCES

1. <https://www.pdfdrive.com/database-management-system-dbms-tutorial-d17429678.html>
2. http://www.lincoste.com/ebooks/english/pdf/computers/database_management_systems.pdf
3. <http://deccancollege.ac.in/CSESTD MAT/DR.P.VISHVAPATHI/DMBOOK.pdf>
4. <https://cs.wmich.edu/~yang/teach/cs595/han/ch01.pdf>
5. <https://www.db-book.com/db4/slide-dir/ch1-2.pdf>

SENGAMALA THAYAR EDUCATIONAL TRUST WOMEN'S COLLEGE

(AUTONOMOUS)

SUNDARAKKOTTAI, MANNARGUDI- 614016.

(For the Candidates admitted in the academic year 2021 – 2022)



DEPARTMENT OF COMPUTER APPLICATIONS

MASTER OF COMPUTER APPLICATIONS (MCA)

Semester: I-CC-III: Design and Analysis of Algorithms

Ins. Hrs./Week: 5

Course Credit: 4

Course Code: 21PCA103

OBJECTIVES

- To understand basic design concepts such as Pseudo code, specifications, top-down design
- To Know the Mathematical aspects, and Knowledge of Analyzing Sorting and Searching Algorithm
- To obtain the Knowledge of algorithm design strategies and Familiarity with an assortment of important algorithm methods

UNIT- I: Basic Concepts of Algorithms (15 Hours)

Introduction – Notion of Algorithm – Fundamentals of Algorithmic Solving – Important Problem types – Fundamental Data Structures-Fundamentals of the Analysis Framework – Asymptotic Notations and Basic Efficiency Classes.

UNIT- II: Mathematical Aspects and Analysis of Algorithms (15 Hours)

Mathematical Analysis of Non-recursive Algorithm – Mathematical Analysis of Recursive Algorithm – Example: Fibonacci Numbers – Empirical Analysis of Algorithms – Algorithm Visualization.

UNIT- III: Analysis of Sorting and Searching Algorithms (15 Hours)

Brute Force – Selection Sort and Bubble Sort – Sequential Search and Brute-force string matching – Divide and conquer – Merge sort – Quick Sort – Binary Search – Binary Tree Traversal and Related Properties – Decrease and Conquer – Insertion Sort – Depth first Search and Breadth First Search.

UNIT- IV: Algorithmic Techniques (15 Hours)

Transform and conquer – Presorting – Balanced Search trees – AVL Trees – Heaps and Heap sort – Dynamic Programming – Warshall's and Floyd's Algorithm – Optimal Binary Search trees – Greedy Techniques – Prim's Algorithm – Kruskal's Algorithm – Dijkstra's Algorithm – Huffman trees.

UNIT- V: Algorithm Design Methods (15 Hours)

Backtracking – n-Queen's Problem – Hamiltonian Circuit problem – Subset-Sum problem – Branch and bound – Assignment problem – Knapsack problem – Traveling salesman problem- Approximation Algorithm for NP-Hard Problem.

Total Lecture Hours- 75

COURSE OUTCOME

Students will be able to

1. Learn the basic concepts of algorithms and Basic efficiency classes
2. Analyze mathematical foundation in analysis of algorithms
3. Know the sorting and searching algorithm for solving problem
4. Understand different algorithmic technique
5. Understand different algorithmic design strategies

TEXT BOOK(S)

1. Anany Levitin. 2012. Introduction to the Design and Analysis of Algorithm”, Third Edition, Pearson Education Asia.

REFERENCE BOOK(S)

1. T.H Cormen, C.E Leiserson, R.L Rivest and C.Stein. 2009. Introduction to Algorithms. Third Edition, PHI Pvt.Ltd, New Delhi .
2. Sara Baase and Allen Van Gelder. 2008. Computer Algorithms - Introduction to Design and Analysis. Third Edition, Pearson Education Asia, New Delhi.
3. A.V.Aho, J.E.Hopcroft and J.D.Ullman. 2009. The Design and Analysis of Computer Algorithms, Pearson Education Asia, New Delhi.
4. Benoit, Yves Robert, Frédéric Vivien. 2013. A Guide to Algorithm Design. Paradigms, Methods and Complexity Analysis. First Edition, CRC Press, USA.
5. Jon Kleinberg, Eva Tardos. 2005. Algorithm Design, First Edition, Pearson Addison Wesley, USA

E-RESOURCES

1. https://www.tutorialspoint.com/design_and_analysis_of_algorithms/index.htm
2. <https://www.javatpoint.com/daa-tutorial>
3. <https://nptel.ac.in/courses/106/106/106106131/>
4. <https://en.wikipedia.org/wiki/NP-hardness>
5. <https://www.programiz.com/dsa/kruskal-algorithm>

SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS)



SUNDARAKKOTTAI, MANNARGUDI- 614016.

(For the Candidates admitted in the academic year 2021 – 2022)

DEPARTMENT OF COMPUTER APPLICATIONS

MASTER OF COMPUTER APPLICATIONS (MCA)

Semester: I-CC-IV: Mathematical Foundations of Computer Science

Ins. Hrs./Week: 5

Course Credit: 4

Course Code: 21PCA104

OBJECTIVES

- To understand the concept of set theory and to explore the knowledge in propositional logic
- To study the proof deduction principles and to understand the concept of graph theory
- To gain knowledge to apply recurrence relation in Computer science

UNIT- I: Set Theory

(15 Hours)

Set: Definition- Inclusion and Equality of sets – Power set – Operations on Set – Ordered pairs and n-tuples Cartesian products. Relation: Definition – Properties – Relation Matrix – Graph of a Relation – Partition and covering of a set – Equivalence relation – Compatibility relations – Partial ordering. Functions: Definition – Composition of function – Inverse functions – Binary and n-ary Operations.

UNIT- II: Propositional Logic

(15 Hours)

Propositions – Evaluation of constant propositions – Evaluation of propositions in a state – Precedence rules for operators – Tautologies – Propositions as sets of states – Transforming English sentence to propositional form – Laws of Equivalence – Rules of substitution and Transitivity.

UNIT- III: Proofs Deduction

(15 Hours)

Introduction – A formal system of Axioms and inference rules – Introduction to deductive proofs – Inference rules – Proofs and subproofs – Developing Natural deduction proofs – Natural deduction System.

UNIT- IV: Graph Theory

(15 Hours)

Graph – finite & infinite graphs – Incidence & degree – Isolated vertex, Pendant vertex & Null graphs Sub graphs – isomorphism, walks, paths and circuits – connected graphs, Disconnected graphs & components – Euler graphs – operations on graphs – Hamiltonian Paths and circuits.

UNIT- V: Recurrence Relation

(15 Hours)

Numeric functions – Generating functions – Recurrence Relation – Linear Recurrence Relations with constant coefficients – Homogeneous solutions – Particular solutions – Total solutions – Solution by the method of generating functions.

Total Lecture Hours- 75

COURSE OUTCOME

Students will be able to

1. Understand the concept of set theory
2. Explore the knowledge in propositional logic
3. Know the proof deduction principles
4. Understand the concept of graph theory
5. Gain knowledge to apply recurrence relation in Computer Science

TEXT BOOK(S)

1. J P Tremblay, R Manohar. Discrete Mathematical Structures with Applications to Computer Science, Tata McGraw-Hill, New Delhi
2. David Gries. 1981. The Science of Programming. Narosa Publishing House, Chennai.
3. G J Narsingdeo. Graph theory with applications to engineering and computer science. Prentice hall India learning private limited.
4. C.L. Liu. Elements of Discrete Mathematics. Second Edition, Tata McGraw-Hill book Company, New Delhi.

REFERENCE BOOK(S)

1. K H Rosen. 1999. Discrete Mathematics and its Applications. Mc-Graw Hill Book Company, New Delhi.
2. D Shanthi, Sophia Bharathi. Discrete Structures of Computer Science. Charulathapublications, Chennai.
3. Richard J Trudeau. 1993. Introduction to Graph Theory. Dover publications, USA.
4. Herbert Enderton, 1977. Elements of Set Theory. First Edition, Academic press, Cambridge, USA.
5. Mauricio Ayala-Rincón, Flávio L. C. de Moura. 2017. Applied Logic for Computer Scientists: Computational Deduction and Formal Proofs. First Edition, Springer.

E-RESOURCES

1. <https://www.pdfdrive.com/mathematical-foundation-of-computer-science-d18828981.html>
2. <https://nlist.inflibnet.ac.in/>
3. <https://ndl.iitkgp.ac.in/>
4. https://www.researchgate.net/publication/336567484_MATHEMATICAL_FOUNDATION_OF_COMPUTER_SCIENCE
5. <http://web.stanford.edu/class/archive/cs/cs103/cs103.1164/notes/Mathematical%20Foundations%20of%20Computing.pdf>

SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE

(AUTONOMOUS)

SUNDARAKKOTTAI, MANNARGUDI- 614016.

(For the Candidates admitted in the academic year 2021 – 2022)

DEPARTMENT OF COMPUTER APPLICATIONS

MASTER OF COMPUTER APPLICATIONS (MCA)



Semester: I-CP-I: Java Programming Lab

Ins. Hrs./Week: 3

Course Credit: 2

Course Code: 21PCA105P

OBJECTIVES

- To get hands on experience in Programming using Java applications
- To learn and implement object-oriented programming concepts
- To develop web applications using Java applet

LIST OF PROGRAMS

1. Assume that a bank maintains 2 kinds of account for its customers' one called savings account and the other current account' The savings account provides compound interest and withdraw facilities but no cheque book facility. The current account provides cheque book facility but no interest. Current account falls below this level a service charge is imposed. Create a class Account that stores customers name' account number and type of account. From this derive the classes current-acct and saving-acct to make them more specific to their requirements. Introduce the necessary methods in order to achieve the following tasks:
 - a. Accept deposit form a customer and update the balance.
 - b. Display any deposit interest
 - c. Compute and deposit interest.
 - d. Permit withdrawal and update the balance.
 - e. Check for the minimum balance' impose penalty' if necessary and update the balance.
2. Use constructors and methods to initialize the class members. Write a program that accepts a shopping list of five items from the command line and stores them in a vector and accomplish the following:
 - a. To delete an item in the list.
 - b. To add an item at a specified location in the list.
 - c. To add an item at the end of the list.
 - d. To print the contents of the vector.
3. Implementation of the concept of multiple inheritance using interfaces and designs a package to contain the class students and another package to contain the interfaces sports.
4. Develop a simple real-life application program to illustrate the use of multithreads.
5. Create a try block that is likely to generate three types of exception and then incorporate necessary catch blocks to catch and handle them appropriately.
6. Develop a simple program using ArrayList An array list is created, and then objects of type **String** are added to it. The list is then displayed. Some of the elements are removed and the list is displayed again.
7. Write a Java applet' which will create the layout below: **FORMAT** Enter yourName:
Enter your Age:
Select City: *Delhi *Madras
Select SIW: *Oracle *Visual Basic *Java OK CANCEL

8. Handle the following simple validations. The name entered should be less than 25 characters wide. Age entered should be done as the user exits the fields as well as when OK button is pressed. Hint use the Boolean action (Event evt object arg)
9. Write an Applet which will play two sound notes in a sequence continuously use the Play() methods available in the applet class and the methods in the Audio clipinterface.
10. Write a Java applet program to demonstrate Calendar using calendar methods.
11. Write an Applet program to constructs several colors and draws variousobjects.

Total Lab Hours- 45

COURSE OUTCOME

Students will be able to

1. Write java programming using Classes and objects
2. Implement Inheritance and Exception Handling
3. Apply Multithreaded and Collection Classes in java programs
4. Usevalidation code in programs
5. Develop Applets and Applications

REFERENCE BOOK(S)

1. Herbert Schildt. 2019. The Complete Reference Java 2. Eleventh Edition, McGraw-Hill Education Pvt. Ltd., New Delhi.
2. Donald Bales. 2001. Java Programming with Oracle JDBC. First Edition, O'Reilly Media, Newton, USA.
3. Herbert Schildt, Joe O' Neil. 2000. Java 2 Programmer's Reference. Tata McGraw Hill Ltd., New Delhi.
4. Somasundaram K. 2006. Programming in Java. First Edition, Jaico Publications House, Chennai.
5. Steven Haines. 2001. Java 2 from Scratch. First Edition, Prentice Hall of India, New Delhi.

E-RESOURCES

1. www.HerbSchildt.com
2. <http://learnjavaonline.org>
3. www.Tutorialspoint.com
4. www.ideone.com
5. <https://www.w3schools.com/java/>

SENGAMALA THAYAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS)



SUNDARAKKOTTAI, MANNARGUDI- 614016.
(For the Candidates admitted in the academic year 2021 – 2022)
DEPARTMENT OF COMPUTER APPLICATIONS
MASTER OF COMPUTER APPLICATIONS (MCA)

Semester: I-CP-II: RDBMS and Data mining Lab

Ins. Hrs./Week: 3

Course Credit: 2

Course Code: 21PCA106P

OBJECTIVES

- To get hands on experience in developing queries using SQL
- To get hands on experience in PL/SQL
- To get hands on experience in Data mining lab by using WEKA tool

RDBMS

1. SQL – Data Definition Language
 - 1.1 Table Creation with Constraints
 - 1.2 Table Alteration (Add Column, Modify the size and data type, Drop Column)
 - 1.3 Drop Table
2. SQL – Data Manipulation Language
 - 2.1 Data Insertion
 - 2.2 Data Updating
 - 2.3 Data Deletion
 - 2.4 Ordering Tuples
 - 2.5 Tuple Variable
 - 2.6 Pattern Matching
 - 2.7 Build-in Function
 - 2.8 Set Operations
 - 2.9 Join Operations
 - 2.10 Nested Subqueries
 - 2.11 Views
3. PL/SQL
 - 3.1 Reverse the string
 - 3.2 Delete any record and count it
 - 3.3 Student Mark Sheet Preparation
 - 3.4 Pay Roll preparation
 - 3.5 Excess record stored in separate files
 - 3.6 Split a table in to two tables
 - 3.7 Joining two tables in to one table
 - 3.8 Find factorial number using recursive function
 - 3.9 Find Fibonacci series using recursive function

DATA MINING

1. Create data-set in .arff file format. Demonstration of preprocessing on WEKA data-set
2. Demonstration of Association rule process on data-set contact lenses.arff /supermarket (or any other data set) using Apriori
3. Demonstration of classification rule process on WEKA data-set using j48 algorithm
4. Demonstration of classification rule process on WEKA data-set using Naive Bayes algorithm
5. Demonstration of clustering rule process on data-set iris.arff using simple k-means

Total Lab Hours- 45

COURSE OUTCOME:

Students will be able to

1. Develop queries for DDL in SQL
2. Write queries for DML in SQL
3. Develop Program in PL/SQL
4. Understand and Practice in Weka Tool
5. Analyze dataset using Data Mining techniques

REFERENCE BOOK(S):

1. Sylvia MoestlVasilik. 2017. SQL Practice Problems: 57 beginning, intermediate, and advanced challenges for you to solve using a “learn-by-doing”, Updated 2020 edition, independently published.
2. Forta Ben. 2012. Sams Teach Yourself SQL in 10 Minutes. Fourth Editions, SAMS Publishing, U.S.A
3. Lynn Beighley. 2012. Head First SQL (A Brain Friendly Guide). First Edition, O'Reilly Media, Inc. U.S.A.
4. Ian H. Witten, Eibe Frank, Mark A. Hall. 2011. Data Mining: Practical Machine Learning Tools and Techniques. Third Edition, Morgan Kaufmann. Inc., USA.
5. Steven Feuerstein. 2014. Oracle PL/SQL Programming: Covers Versions Through Oracle Database 12c. 6th Edition, O'Reilly Media, Inc. USA.

E-RESOURCES

1. <https://cs.ccsu.edu/~markov/weka-tutorial.pdf>
2. https://docs.oracle.com/cd/E11882_01/appdev.112/e25519.pdf
3. https://datubaze.files.wordpress.com/2015/09/s_feuerstein_oracle-pl_sql-programming_6th-edition_2014.pdf
4. <https://ptgmedia.pearsoncmg.com/images/9780672336072/samplepages/0672336073.pdf>
5. <https://doc.lagout.org/Others/Data%20Mining/Data%20Mining%20Practical%20Machine%20Learning%20Tools%20and%20Techniques%20%283rd%20ed.%29%20%5BWitten%2C%20Frank%20%26%20Hall%202011-01-20%5D.pdf>

SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS)



SUNDARAKKOTTAI, MANNARGUDI- 614016.

(For the Candidates admitted in the academic year 2021 – 2022)

DEPARTMENT OF COMPUTER APPLICATIONS

MASTER OF COMPUTER APPLICATIONS (MCA)

Semester: I-EC-I:1 Digital Computer Fundamentals

Ins. Hrs./Week: 4

Course Credit: 4

Course Code: 21PCAE1A

OBJECTIVES

- To learn the Fundamental components used in a Digital Computer which is essential for the program
- To understand number representation and conversion between different representation in digital electronic circuits
- To understand laws and theorems of Boolean algebra and simplifying the logic circuits and to analyze logic processes and implement logical operations using combinational logic circuits and sequential circuits

UNIT-I: Number Systems and Codes (12 Hours)

Binary Number System – Binary to Decimal Conversion – Decimal to Binary Conversion – Binary Addition – Binary Subtraction – Binary Multiplication and Division – Octal Numbers – Hexadecimal Numbers – Binary Codes – Error Detecting Codes – Error Correcting Codes.

UNIT- II: Logic Gates and Circuits (12 Hours)

Boolean Algebra and Logic Gates – AND, OR, NOT, NAND, NOR, Exclusive OR gates – Applications of XOR Gate – The Exclusive NOR Gate – Positive and Negative Logic – Logic Characteristics – Bipolar Logic Families – Integrated Circuits – Boolean Algebra: Definitions – Fundamentals of Boolean Algebra – Boolean Functions – Minterms and Maxterms – Laws and Theorems of Boolean Algebra – DeMorgan's Theorem – Universal Building Blocks (UBB).

UNIT- III: Boolean Algebra (12 Hours)

Simplifying Logic Circuits – Sum of Products – Sum of Products and Product of Sums Forms – Karnaugh Maps – Product of Sums Simplification – NAND and NOR Implementation – Don't Care Conditions – Overlapping Groups – Rolling the Map – Eliminating Redundant Groups.

UNIT- IV: Combinational Logic Circuits (12 Hours)

Introduction – Adders – The Half Adder – The Full Adder – Subtractors – BCD Adder – Multiplexers – Demultiplexers – Decoders – Encoders – Floating Point Number System – Range of Stored Numbers.

UNIT- V: Sequential Logic Circuits (12 Hours)

Flip Flops – RS Flip Flop – Clocked RS Flip Flop – D Flip Flop – JK Flip Flop – T Flip Flop – Triggering of Flip Flops – Master Slave Flip Flop – Conversion of D Flip Flop – Conversion of T Flip Flop – Transfer Circuit – Clock – Counters and Shift Registers: Counters – Asynchronous or Ripple Counter – Ring Counter – Twisted Ring Counter – State Diagrams and State Tables – Magnitude Comparator – Programmable Arrays of Logic Cells – Shift Registers.

COURSE OUTCOME

Students will be able to

1. Convert different type of codes and number systems which are used in digital communication and computersystems
2. Employ the codes and number systems converting circuits and Compare different types of logic families which are the basic unit of different types of logic gates in the domain of economy, performance andefficiency
3. Analyze different types of digital electronic circuit using various mapping and logical tools and know the techniques to prepare the most simplified circuit using various mapping and mathematical methods
4. Design different types of with and without memory element digital electronic circuits for particular operation, within the realm of economic, performance, efficiency, user friendly and environmental constraints
5. Develop a digital logic and apply it to solve real lifeproblems

TEXT BOOK(S)

1. Dr. K. Meena. 2009. Principles of Digital Electronics. PHI Learning Private Limited, New Delhi.
2. Floyd, Thomas L. 1997. Digital Computer Fundamentals. Tenth Edition, University BookStall.
3. Anil K.Maini. Digital Electronics principles and Integrated Circuits. Wiley IndiaPvt.Ltd

REFERENCE BOOK(S)

1. M. Morris Mano. 2010. Digital Logic Design, Pearson Education, London
2. V.Rajaraman. 2002. Fundamentals of Computers. Third Edition, PHI, NewDelhi.
3. Malvino, Paul Albert and Leach, Donald P. 2000. Digital Principles and Applications. 4th Edition, TMH, New Delhi.
4. Malvino, Paul Albert and Leach, Donald P. 1995. Digital Computer Fundamentals. Third Edition, TMH, New Delhi.
5. Bartee, Thomas C. 1995. Digital Computer Fundamentals. Sixth Edition, TMH, New Delhi.

E-RESOURCES

1. http://jenko.eu/marjan/fpp_izredni/knjiga_df/df_00_preface.pdf
2. https://academia.edu/40308061/Digital_Fundamentals_11th_Edition_by_Thomas_L_Floyd
3. <https://people.cs.clemson.edu/~yfeaste/855Assignments/presentations/Team6-Combinational%20Logic%20Circuit.pdf>
4. https://www.cs.ou.edu/~fagg/classes/ame3623_s05/lectures/class_sequential.pdf
5. <http://bwrcs.eecs.berkeley.edu/Classes/IcBook/SLIDES/slides6.pdf>
6. <https://nptel.ac.in/content/storage2/courses/106108099//Digital%20Systems.pdf>

SENGAMALA THAYAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS)



SUNDARAKKOTTAI, MANNARGUDI- 614016.

(For the Candidates admitted in the academic year 2021 – 2022)

DEPARTMENT OF COMPUTER APPLICATIONS

MASTER OF COMPUTER APPLICATIONS (MCA)

Semester: I-EC-I:2 Computer Architecture

Ins. Hrs./Week: 4

Course Credit: 4

Course Code: 21PCAE1B

OBJECTIVES

- To analyze the decimal, binary, octal and hexadecimal number systems along with their conversion techniques and to describe other binary codes, alphanumeric codes and error detection codes with conversion techniques
- To Explain the logic gates AND, OR, NOT, NOR, NAND, XOR and XNOR with their truth tables and Explaining Combinational Circuit such as Half adder, full adder, Half subtractor and Full subtractor, binary Adder with circuit diagrams and truth table
- To explain the Synchronous, Asynchronous, BCD and Ring counters using Circuit diagram and truth table

UNIT- I: Number System and Arithmetic (12 Hours)

Number Systems – Decimal, Binary, Octal and Hexadecimal Systems – Conversion from one system to another – Binary Addition, Subtraction, Multiplication and Division – Binary Codes– 8421, 2421, Excess-3, Gray, BCD – Alphanumeric Codes – Error Detection Codes.

UNIT- II: Logic Gates (12 Hours)

Basic Logic Gates – Universal Logic – Boolean Laws and Theorems – Boolean Expressions – Sum of Products – Product of Sums – Simplification of Boolean Expressions –Karnaugh Map Method (up to 4 Variables) – Implementation of Boolean Expressions using Gate Networks.

UNIT- III: Multiplexers and Demultiplexers (12 Hours)

Combinational Circuits – Multiplexers – Demultiplexers – Decoders – Encoders – Arithmetic Building Blocks – Half and Full Adders – Half and Full Subtractors – Parallel adder –2's Complement Adder – Subtractor – BCD Adder.

UNIT- IV: Sequential Circuits (12 Hours)

Sequential Circuits – Flip Flops – RS, Clocked RS, D, JK, T and Master-Slave Flip Flops – Shift Register – Counters – Asynchronous counter(or)Ripple counter, MOD-n and Synchronous Counters – BCD Counter – Ring Counter.

UNIT- V: Central Processing Unit (12 Hours)

General Register Organization – Bus System-Control word-Stack Organization – Register Stack- Instruction Formats – Addressing Modes – Data Transfer and Manipulation – Program Interrupt– Reduced Instruction Set Computer(RISC)and CISC Architecture – CISC characteristics – RISC Characteristics.

Total Lecture Hours- 60

COURSE OUTCOME

Students will be able to

1. Analyze the decimal, binary, octal and hexadecimal number systems along with their conversion techniques
2. Describe other binary codes, alphanumeric codes and error detection codes with conversion techniques
3. Explaining Combinational Circuit such as Half adder, full adder, Half subtracter and Full subtracter, binary Adder with circuit diagrams and truth table
4. Explain the Synchronous, Asynchronous, BCD and Ring counters using Circuit diagram and truth table
5. Explain about Reduced Instruction Set Computer (RISC) and CISC Architecture, CISC characteristics, RISC characteristics

TEXT BOOK(S)

1. Donald P. Leach, Albert Paul Malvino and Goutam Saha. 2007. Digital Principles and Applications, Sixth Edition, Tata McGraw Hill, New Delhi.
2. Thomas C. Bartee. 2006. Digital Computer Fundamentals, Sixth Edition, Tata McGraw-Hill, New Delhi.
3. Morris Mano M. 2008. Computer System Architecture, Third Edition, Prentice Hall of India, New Delhi.

REFERENCE BOOK(S)

1. Morris Mano M. 2008. Digital Logic and Computer Design. Prentice Hall of India, New Delhi.
2. Linda Null, Julia Lobur. 2014. The Essentials of Computer Organization and Architecture. Fourth Edition, Wiley Publisher.
3. John L. Hennessy, David A. Patterson, 2006, Computer Architecture: A Quantitative Approach, Fourth Edition, Morgan Kaufmann
4. William Stallings. 2002. Computer Organization and Architecture. Sixth Edition, Prentice Hall International Editions, USA.
5. Sajjan G. Shiva. 2008. Computer Organization Design and Architecture. Fourth Edition, CRC press, USA.

E-RESOURCES

1. http://home.ustc.edu.cn/~leedsong/reference_books_tools/Computer%20Organization%20and%20Architecture%2010th%20-%20William%20Stallings.pdf
2. <https://www.javatpoint.com/computer-organization-and-architecture-tutorial>
3. <https://www.geeksforgeeks.org/computer-organization-and-architecture-tutorials/>
4. <https://www.studytonight.com/computer-architecture/>
5. <https://www.learncomputerscienceonline.com/computer-organization-and-architecture/>

SENGAMALA THAYAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS)



SUNDARAKKOTTAI, MANNARGUDI- 614016.

(For the Candidates admitted in the academic year 2021 – 2022)

DEPARTMENT OF COMPUTER APPLICATIONS

MASTER OF COMPUTER APPLICATIONS (MCA)

Semester: I-EC-I:3 Fundamental of Management Information System

Ins. Hrs./Week: 4

Course Credit: 4

Course Code: 21PCAE1C

OBJECTIVES

- To expose the students to the managerial issues relating to information systems and help them to identify and evaluate various options in this regard
- To understand the leadership role of Management Information Systems in achieving business competitive advantage through informed decision making
- To analyse and synthesize business information and systems to facilitate evaluation of strategic alternatives and to communicate strategic alternatives to facilitate decision making effectively

UNIT-I: Introduction to MIS

(12 Hours)

Definition of MIS – MIS versus Data Processing – MIS & Decision support System – Fundamental of Information Systems – Types of Information System – Concept of an MIS – Structure of MIS.

UNIT- II: MIS Planning Structure

(12 Hours)

Concept of organization planning – The Planning Process –Characteristics of Control process – The nature of control in an Organization.

UNIT- III: Information System

(12 Hours)

Internet and Electronic Commerce –Information System for Business Operations – Information System for Managerial Decision Support – Information System for Strategic Advantage.

UNIT- IV: Information Controls and Security

(12 Hours)

Information Resource Management –Challenges to global Information Systems – Information System Controls – Information Ethics –Concept of Information Security.

UNIT- V: Enterprise Resource Planning

(12 Hours)

Enterprise Resource Planning – ERP Benefits – ERP Modules – Supply Chain Management – Supply Chain Decisions –Seven Principles of Supply Chain – Component of CRM –Features of Procurement Management System.

Total Lecture Hours- 60

COURSE OUTCOME

Students will be able to

1. Relate the basic concepts and technologies used in the field of management information systems
2. Compare the processes of developing and implementing information systems
3. Outline the role of the ethical, social, and security issues of information systems
4. Translate the role of information systems in organizations, the strategic management processes, with the implications for the management
5. Apply the understanding of how various information systems like DBMS work together to accomplish the information objectives of an organization

TEXT BOOK(S)

1. Avdhesh Gupta, AnuragMalik. 2006. Management Information Systems. Second Edition, An Imprint of Laxmi Publications Pvt,Ltd., Chennai.
2. C S V Murthy. 2017. Management Information Systems.Himalaya publication, Mumbai.
3. M Jaiswal and M Mittal. 2004. Management Information Systems. Oxford University Press India.

REFERENCE BOOK(S)

1. Gupta A.K.2014. Management Information Systems. S.Chand Publications, Chennai.
2. James O'Brien. 2019. Management Information Systems. Eleventh Edition,McGraw Hill Publications, New Delhi.
3. Kenneth C.Laudon, Jane P.Laudon. 2017. Management Information Systems. Fifteenth Edition, Pearson Education, London.
4. Pooja Singh,Suman Mann, SeemaShokeen. 2018. Information Systems Management, IK International Publishing House, New Delhi.
5. SashikalaParimi. 2012. Management Information Systems.First Edition, Dreamtech Press, New Delhi.

E-RESOURCES

1. <https://www.slideshare.net/HarishChand5/management-information-system-full-notes>
2. <https://www.sigc.edu/department/mba/studymet/ManagmentInformationSystem.pdf>
3. <https://www.shopify.com/encyclopedia/management-information-systems-mis>
4. <https://www.cleverism.com/management-information-systems-mis>
5. <https://searchitoperations.techtarget.com/definition/MIS-management-information-systems>

SENGAMALA THAYAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS)



SUNDARAKKOTTAI, MANNARGUDI- 614016.

(For the Candidates admitted in the academic year 2021 – 2022)

DEPARTMENT OF COMPUTER APPLICATIONS

MASTER OF COMPUTER APPLICATIONS (MCA)

Semester: II-CC-V: Python Programming

Ins. Hrs./Week: 5

Course Credit: 4

Course Code: 21PCA207

OBJECTIVES

- To impart knowledge about data analysis using pythonprogramming
- To learn about functions and strings of python programming and to learn about case studies of Word play, data structure selection and etc.
- To know about oops, GUI, Web and database programming

UNIT- I: Basic of Python

(15 Hours)

The way of the program – What is a program? – Running Python – The first program – Arithmetic operators – Values and types – Formal and natural languages – Variables, Expression and Statements – Functions – Case Study: interface design – Conditionals and Recursion – Fruitful functions – Iteration – Strings – Case Study: word play

UNIT- II: Data Types

(15 Hours)

Lists – A list is a sequence – Lists are mutable – Traversing a list – List operations – List slices – List methods – Map, filter and reduce – Deleting elements – Lists and strings – Objects and values – Aliasing – List arguments – Debugging –Tuples – Dictionaries – Case Study: Data Structure selection – Files.

UNIT- III: Classes and Function

(15 Hours)

Classes and objects – Programmer-defined types – Attributes Rectangles – Instances as return values – Objects are mutable – Copying – classes and functions – Time – Pure functions – Modifiers – Object-oriented features – Printing object – The init method – The _str_ method – operator overloading – Type-based dispatch – Polymorphism – Interface and implementation – Prototyping versus planning – classes and methods – Case Study: Tkinter.

UNIT- IV: Inheritance and Regular Expression

(15 Hours)

Card objects – Class attributes – Comparing cards – Decks – Printing the deck – Add, remove, shuffle and sort – Inheritance – Class diagrams – Debugging – Data encapsulation – Goodies – Conditional expressions – List comprehensions – Generator expressions – any and all – Sets – Counters – defaultdict – Named tuples – Gathering keyword args – Regular Expression.

UNIT- V: Advanced programming

(15 Hours)

GUI Programming – Communication end points – network programming in python – Tkinter with python programming – Tkinter example – Web Programming – web surfing with python: creating simple web clients – advanced web clients – CGI: Helping web servers process client data – building CGI application – Advanced CGI – Web (HTTP) servers – Database Programming – Python Database Application Programmers Interface (DB-API) – Object Relational Managers.

Total Lecture Hours- 75

COURSE OUTCOME

Students will be able to

1. Read, write, execute by hand simple Python programs
2. Structure simple Python programs for solving problems
3. Decompose a Python program into functions
4. Represent compound data using Python lists, tuples
5. Create GUI, Web and database programming

TEXT BOOK(S)

1. Allen B Downey. 2012. Think Python: How to Think like a Computer Scientist. Second Edition, O'Reilly media, USA.
2. Chun Wesley J. 2007. Core Python Programming. Second Edition, Pearson education, London.

REFERENCE BOOK(S)

1. Charles Dierbach. 2013. Introduction to Computer Science using Python: A Computational Problem- Solving Focus. Wiley India Edition.
2. Timothy A. Budd. 2015. Exploring Python. Mc-Graw Hill Education (India) Private Ltd.
3. Gowrishankar S, Veena A. 2018. Introduction to Python Programming. First Edition, CRC Press, Florida, USA.
4. Jake Vander Plas. 2016. Python Data Science Handbook: Essential Tools for Working with Data. First Edition, O'Reilly Media, Newton, USA.
5. Miguel Grinberg. 2018. Flask Web Development: Developing Web Applications with Python, Second Edition, O'Reilly Media, Newton, USA

E-RESOURCES

1. <https://downloads.mysql.com/docs/connector-python-en.pdf>
2. <http://index-of.es/Python/Core.Python.Programming.2nd.Edition.Wesley.Chun.2006.pdf>
3. <http://index-of.es/Python/Exploring%20Python.pdf>
4. <https://files.meetup.com/18552511/Learn%20Python%20The%20Hard%20Way%203rd%20Edition%20V413HAV.pdf>
5. www.ideone.com



(AUTONOMOUS)
SUNDARAKKOTTAI, MANNARGUDI- 614016.
(For the Candidates admitted in the academic year 2021 – 2022)
DEPARTMENT OF COMPUTER APPLICATIONS
MASTER OF COMPUTER APPLICATIONS (MCA)

Semester: II-CC-VI: Distributed Technologies using J2EE and Dot NET

Ins. Hrs./Week: 5

Course Credit: 4

Course Code: 21PCA208

OBJECTIVES

- To know the Concepts of Distributed systems
- To know the various Technologies Architectures
- To understand and compare the technologies associated with J2EE and DOTNET

UNIT- I: Distributed Systems and Technologies Architecture (15 Hours)

Characterization of Distributed Systems – Introduction – Examples of distributed System – Resource sharing and the web – Challenges –System Models: Architectural Model –J2EE Overview –J2EE Multi-Tier Architecture–DOT NET Architecture – MVC Architecture.

UNIT- II: J2EE Databases (15 Hours)

J2EE Database Concepts – JDBC Objects – JDBC and Embedded SQL: Tables – Indexing – Inserting Data into Tables – Selecting Data from a Table – Metadata –Update – Delete – Joining – Calculating – Grouping and Ordering Data –subqueries–view.

UNIT- III: J2EE Foundation (15 Hours)

J2EE Foundation: HTML, XML, XHTML – Java and XML – Java Servlets –JSP –EJB: Session Java Bean – Entity Java Bean –Message Driven Bean– JavaMailAPI–Java Interface Definition Language and CORBA –Java RMI.

UNIT- IV: ASP.NET (15 Hours)

Introduction: .Net Framework – .Net Languages – Data Types – Declaring Variables – Conditional Structures – Loop Structures – Function and Subroutines – Types, Objects and Namespace –Web Form Fundamentals: Page Class –web controls– Rich Controls – AdRotator,Calendar controls – Validation Control –Validation Example – Gridview Control – Detail view and FormView Controls.

UNIT- V: ADO.NET (15 Hours)

ADO.NET Architecture: ADO.NET Namespaces – .NET Data Providers – Core Classes – Overview of ADO.NET:Introducing ADO.NET and Data Management – Characteristics of ADO.NET – ADO.NET Object Model – ADO.NET Data Access.

Total Lecture Hours- 75

COURSE OUTCOME

Students will able to

1. Describe distributed system and its architecture
2. Understand the J2EE data base concepts and its objects
3. Understand XML, HTML, Servlets, JSP and EJB component
4. Describe the basic structure of ASP.NET and use the main features
5. Describe ADO.NET and its features

TEXT BOOK(S)

1. George Coulouris, Jean Dollimore, Tim Kindberg. 2009. Distributed Systems Concepts and Design. Fourth Edition, Dorling Kindersley(India) Pvt. Ltd, Pearson Education, London.
2. Jim Keogh. 2002. J2EE: The Complete Reference. 28th Reprint Tata McGraw Hill Education Pvt. Ltd., New Delhi.
3. Matthew MacDonald, 2002, ASP.NET: The Complete Reference. First Edition, Tata McGraw Hill Education Pvt. Ltd, New Delhi.
4. Michael Otey, Danielle Otey. 2003. ADO.NET: Complete Reference. Eighth Reprint, Tata McGraw Hill Education Pvt. Ltd., New Delhi.

REFERENCE BOOK(S)

1. Hitesh Seth. 2003. Microsoft .NET: Kick Start. First Edition, Sams Publishing, Chennai.
2. Justin Couch, Daniel H Steinberg. 2002. J2EE Enterprise Edition Bible. Hungry Minds Inc., New York.
3. Platt S David. 2002. Introducing Microsoft .Net. Third Edition, Microsoft Press, USA.
4. Stephanie Bodoff, Dale Green, Eric Jendrock. 2002. The J2EE tutorial. Addison-Wesley, Boston, USA.
5. Stephen Walther, Kevin Hoffman, Nate Dudek. 2010. ASP.NET 4 Unleashed. First Edition, Sams publishing, USA.

E- RESOURCES

1. <https://netbeans.org/kb/trails/java-ee.html>
2. <https://www.informit.com/articles/article.aspx?p=26660>
3. <https://www.dotnettricks.com/books>
4. <https://www.javatpoint.com/entity-bean>
5. https://www.tutorialspoint.com/asp.net/asp.net_ado_net.htm



(AUTONOMOUS)
SUNDARAKKOTTAI, MANNARGUDI- 614016.
(For the Candidates admitted in the academic year 2021 – 2022)
DEPARTMENT OF COMPUTER APPLICATIONS
MASTER OF COMPUTER APPLICATIONS (MCA)

Semester: II-CC-VII: Operating Systems

Ins. Hrs./Week: 5

Course Credit: 4

Course Code: 21PCA209

OBJECTIVES

- To understand the basic components of a computer operating system, and the interactions among the various components
- To understand and get knowledge of process control, threads, deadlock
- To understand and get knowledge of Memory Management, scheduling, virtual memory, File Management of an operating system

UNIT- I: Computer System and OS Overview (15 Hours)

Computer System Overview – Operating Systems Objectives and functions – Operating System and User/Computer Interface, Operating System as a Resource Manager: Ease of Evolution Operating Systems. Evolution of Operating Systems – Serial Processing, Simple Batch System, MultiProgrammed Batch Systems, Time Sharing Systems-Developments Leading to Modern Operating Systems - Microsoft Windows Overview-Traditional Unix Systems- Modern Unix Systems – Linux -Android.

UNIT- II: Process and Thread (15 Hours)

Process Description and Control: Process Description, Process Control – Execution of Operating System. Threads: Processes and Threads. Concurrency – Principles of Concurrency, Mutual Exclusion – Software support, Dekker’s Algorithm – Mutual Exclusion – Hardware support, Message Passing. Deadlock and starvation: Deadlock prevention, Deadlock Detection, Deadlock Avoidance – An Integrated deadlock Strategy-Dining Philosopher Problem.

UNIT- III: Memory Management (15 Hours)

Memory Management Requirements. Memory Partitioning: Fixed Partitioning, Dynamic Partitioning- Placement Algorithm, Relocation –Segmentation. Virtual Memory – Paging – Address Translation in a Paging System. Segmentation – Organization, Address Translation in a Segmentation System – Combined Paging and Segmentation – Virtual Memory – Operating System Software: Fetch Policy, Placement Policy and replacement Policy, Page buffering, Resident Set Management.

UNIT- IV: Scheduling and I/O Management (15 Hours)

Scheduling – Types of Scheduling, scheduling Algorithms: scheduling criteria, FIFO, Round Robin, Shortest Process next, Shortest Remaining Time, Highest response ratio and Feedback scheduling Performance comparison – Fair – Share Scheduling. I/O Management and disk scheduling – Organization of the I/O function – The Evolution of the I/O Function, Logical structure of the I/O function- I/O Buffering- DiskCache.

UNIT- V: File Management (15 Hours)

Files and File Systems, File Management Systems, File System Architecture, File Management Functions – File Directories – File Sharing – Secondary Storage Management : File allocation – UNIX File Management – Linux Virtual File system – Windows File Systems – Android File Management.

Total Lecture Hours- 75

COURSE OUTCOME

Students will be able to

1. Describe and explain the fundamental components of a computer operating system
2. Define and explain Process Description, Concurrency, deadlock
3. Define and explain memory management, virtual memory
4. Define and explain scheduling and its types
5. Explore File Management in Operating Systems

TEXT BOOK(S)

1. William Stallings. 2018. Operating Systems: Internals and Design Principles. Ninth Edition, Pearson Global Edition.

REFERENCE BOOK(S)

1. Ann McHoes, Ida M. Flynn. 2013. Understanding Operating Systems. Seventh Edition, Cengage Learning, New Delhi.
2. Deital H.M. 2002. An Introduction to Operating Systems. Second Edition, Addison Wesley Publishing, USA.
3. Charles Crowley. 1997. Operating Systems-A Design Oriented Approach. IRWIN Publications, Chicago.
4. Abraham Silberschatz, Peter B. Galvin, Greg Gagne. 2005. Operating System Concepts. Seventh Edition, John Wiley & Sons, Inc, USA.
5. Thomas W. Doeppner. 2011. Operating Systems In Depth Design and Programming, John Wiley & Sons Inc, USA.

E-RESOURCES

1. https://www.tutorialspoint.com/operating_system/operating_system_tutorial.pdf
2. <https://www.geeksforgeeks.org/introduction-of-operating-system-set-1/>
3. <https://www.javatpoint.com/os-tutorial>
4. <https://www.youtube.com/watch?v=MbWBM6rxCUk>
5. https://en.wikipedia.org/wiki/File_system

SENGAMALA THAYAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS)



SUNDARAKKOTTAI, MANNARGUDI- 614016.

(For the Candidates admitted in the academic year 2021 – 2022)

DEPARTMENT OF COMPUTER APPLICATIONS

MASTER OF COMPUTER APPLICATIONS (MCA)

Semester: II-CC-VIII: Accounting and Financial Management

Ins. Hrs./Week: 5

Course Credit: 4

Course Code: 21PCA210

OBJECTIVES

- To present the whole range of book keeping & accountancy and to give comprehensive coverage to management accounts
- To Analyze and interpret the financial statements with ratios and they can know the financial position of the company with the help of the ratio
- To Know Cost Accounting, its Methods and Techniques, classifications of cost, Cost volume, profit analysis, marginal costing and decision making

UNIT- I: Basics of Accounting

(15 Hours)

Accounting Principles and Concepts – Double entry book keeping- Journal – Ledger- Trial Balance- Depreciation, Depletion and Amortization - Accounting for depreciation.

UNIT- II: Profit and Loss

(15 Hours)

Trading, Manufacturing and profit and Loss account – Income and expenditure- Accounting record and system- assets and liabilities.

UNIT- III: Financial Statement

(15 Hours)

Analysis and interpretation of financial statements with ratios

UNIT- IV: Cost Accounting

(15 Hours)

Cost Accounting- Methods and Techniques of Cost Accounting- classifications of cost - Material Cost- Labour Cost – Overhead- fixed and variable cost- Cost- volume – profit analysis - marginal costing and decision making.

UNIT- V: Budget

(15 Hours)

Budgeting and budgetary control – types of budgets- Preparation of various functional budgets- Preparations of cash budgets- flexible budgets- Advantages of Budgeting and Budgetary control.

Total Lecture Hours- 75

COURSE OUTCOME

The students will be able to

1. Describe the meaning, objectives and advantages of accounting
2. Identify and understand the Objectives, advantages and need of Book Keeping
3. State the need and objective of preparing trial balance and Final Accounts
4. Analyze and interpret the financial statements with ratios and they can know the financial position of the company with the help of the ratio
5. Know Cost Accounting, its Methods and Techniques, classifications of cost, Cost volume, profit analysis, marginal costing and decision making

TEXT BOOK(S)

1. T.S. Grewal. 2019. Double Entry Book Keeping. Sultan Chand, New Delhi.
2. S.N. Maheswari. 2018. Principles of Management Accounting. Sultan Chand, New Delhi.
3. Shukla, Grewal & Gupta. 2018. Advanced Accounts. Sultan Chand Publications, New Delhi.

REFERENCE BOOK(S)

1. S.K. Gupta & R.K. Sharma. 2010. Practical Problems in Management Accounting, Kalyani publishers, Chennai.
2. Khan and Jain. 2007. Financial Management, Tata McGraw Hill Education, New Delhi.
3. R.L. Gupta and Radhaswamy. 2016. Financial Accounting. S. Chand Publishers, New Delhi.
4. T.S Reddy and A.Murthy. 2012. Financial Accounting. Margham Publications, Chennai.
5. P.C. Tulasian. 2016. Introduction to Accounting. Seventh Edition, Pearson, UK.

E-RESOURCES

1. <https://www.pdfdrive.com/financial-and-management-accounting-d5126265.html>
2. https://en.wikipedia.org/wiki/Financial_management
3. <https://libguides.furman.edu/oer/subject/accounting-and-finance>
4. https://www.youtube.com/watch?v=c_D8sgO8azA
5. https://www.tutorialspoint.com/accounting_basics/index.htm

SENGAMALA THAYAR EDUCATIONAL TRUST WOMEN'S COLLEGE

(AUTONOMOUS)

SUNDARAKKOTTAI, MANNARGUDI- 614016.

(For the Candidates admitted in the academic year 2021 – 2022)

DEPARTMENT OF COMPUTER APPLICATIONS

MASTER OF COMPUTER APPLICATIONS (MCA)



Semester: II-CP-III: Python Lab

Ins. Hrs./Week: 3

Course Credit: 2

Course Code: 21PCA211P

OBJECTIVES

- To Get hands on experience in Basics of Python programming
- To Understand Decision Making and Functions
- To develop programs in Object Oriented Programming, files and Database operations using Python

LIST OF PROGRAMS:

1. Write a program to demonstrate different number data types inPython.
2. Write a program to perform different Arithmetic Operations on numbers inPython.
3. Input an array of n numbers and find separately the sum of positive numbers and negativenumbers.
4. Write a program to insert a number in a sortedarray.
5. Write a program to create, append, and remove lists inpython.
6. Write a program to demonstrate working with tuples inpython.
7. Write a program to demonstrate working with dictionaries inpython.
8. Write a Python Program to check whether the given string is palindrome or not using built in string manipulationmethods.
9. Write a Python Program to read a word and prints the number of letters, vowels and percentage of vowels in the word usingdictionary
10. Write a Python Program to check a given sentence is a pangram or not usingfunction/Module.
11. Write a Python Event driven Program for file operations Press 1: to open file in read mode 2: open the file in write mode 3: current position of the file pointer #4: Reposition the pointer at the beginning 5:exit.
12. Write an Object oriented Python program to create two Time objects: currentTime, which contains the current time; and breadTime, which contains the amount of time it takes for a bread maker to make bread. Then we'll use addTime to figure out when the bread will be done. Write the printTime function to display the time when the bread will be done by the breadmaker.
13. Write a python program for accessing Hospital Information System Using MYSQLDatabase.

Total Lecture Hours- 45

COURSE OUTCOME

Students will be able to

1. Develop simple programs in Python
2. Develop programs using lists,dictionaries and files etc.,
3. Apply object oriented concepts in Python programs
4. Develop event driven programs in python
5. Develop database programs in python

REFERENCE BOOK(S)

1. Allen B Downey. 2012. Think Python: How to Thinklike a Computer Scientist. Second Edition, O'Reilly media, USA.
2. Chun Wesley J. 2007. Core Python Programming. Second Edition, Pearson education, London.
3. Charles Dierbach. 2013. Introduction to Computer Science using Python: A Computational Problem- Solving Focus. Wiley India Edition.
4. Timothy A. Budd. 2015. Exploring Python. Mc-Graw Hill Education (India) Private Ltd.
5. Gowrishankar S, Veena A. 2018. Introduction to Python Programming. First Edition, CRC Press, Florida, USA.

E-RESOURCES

1. <https://downloads.mysql.com/docs/connector-python-en.pdf>
2. <http://index-of.es/Python/Core.Python.Programming.2nd.Edition.Wesley.Chun.2006.pdf>
3. <http://index-of.es/Python/Exploring%20Python.pdf>
4. <https://files.meetup.com/18552511/Learn%20Python%20The%20Hard%20Way%203rd%20Edition%20V413HAV.pdf>
5. www.ideone.com

SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE

(AUTONOMOUS)

SUNDARAKKOTTAI, MANNARGUDI- 614016.

(For the Candidates admitted in the academic year 2021 – 2022)



DEPARTMENT OF COMPUTER APPLICATIONS

MASTER OF COMPUTER APPLICATIONS (MCA)

Semester: II-CP-IV: Distributed Technologies Lab

Ins. Hrs./Week: 3

Course Credit: 2

Course Code: 21PCA212P

OBJECTIVES

- To get hands on experience in developing applications for distributed environment.
- To get hands on experience in ASP.net
- To get hands on experience in DOM and AJAX

LIST OF PROGRAMS

1. Distributed applications using RMI
 - a. Simple RMI application
 - b. RMI application with Database Connectivity
2. Servlets - Returning Information received from the client.
3. Servlets and JDBC - Constructing a response by accessing a database.
4. JSP - use of scriptlet.
5. JSP - use of javabeans.
6. EJB – Session Bean.
7. ASP.NET - Server & Client side controls.
8. ASP.NET and ADO.NET - use of disconnected data object.
9. ASP.NET: Data bind Controls.
10. DOM usage on the server side.
11. AJAX: Dynamic client - server interaction example.

Total Lab Hours- 45

COURSE OUTCOME

Students will be able to

1. Develop the distributed Applications through RMI
2. Create a Servlet and JSP program
3. Develop and run the program using Java Bean and Session Bean
4. Create a ASP.Net Applications using Disconnected data object and Data bind Controls
5. Create a server side applications using DOM and AJAX

E- RESOURCES

1. <https://netbeans.org/kb/trails/java-ee.html>
2. <https://www.informit.com/articles/article.aspx?p=26660>
3. <https://www.dotnettricks.com/books>
4. <https://www.javatpoint.com/entity-bean>
5. https://www.tutorialspoint.com/asp.net/asp.net_ado_net.htm

SENGAMALA THAYAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS)



SUNDARAKKOTTAI, MANNARGUDI- 614016.

(For the Candidates admitted in the academic year 2021 – 2022)

DEPARTMENT OF COMPUTER APPLICATIONS

MASTER OF COMPUTER APPLICATIONS (MCA)

Semester: II-EC-II:1 Probability and Statistics

Ins. Hrs./Week: 4

Course Credit: 4

Course Code: 21PCAE2A

OBJECTIVES

- To inculcate the basics of Probability, Curve-Fitting
- To Learn about Correlation, Regression
- To study about Queuing Theory

UNIT- I: Probability (12 Hours)

Definitions of probability, Addition theorem, Conditional probability, Multiplication theorem, Baye's theorem of probability and Geometric probability. Random variables and their properties, Discrete Random variable, Continuous Random variable, Probability Distribution joint probability distributions their properties.

UNIT- II: Probability Distributions (12 Hours)

Discrete distributions: Binomial, Poisson and their properties. Definition, mean, variance, fitting of the distribution. Continuous distributions: Uniform, Normal, Curve fitting using Principle of Least Squares.

UNIT- III: Multivariate Analysis (12 Hours)

Correlation, correlation coefficient, Rank correlation coefficient, Regression, Regression Analysis, Multiple Regression, chi-square test for goodness of fit, chi-square test for independent of attributes.

UNIT- IV Sampling Distribution (12 Hours)

Sample, populations, statistic, parameter, Sampling distribution, standard error, unbiasedness, efficiency, Maximum likelihood estimator, notion & interval estimation. Testing of Hypothesis: Formulation of Null hypothesis, critical region, level of significance, power of the test.

UNIT- V: Queuing Theory (12 Hours)

Define, Characteristics and representing of a Queuing model, Types of Queuing models: Model I [(M/M/1):(infinity/FIFO)], Model II [(M/M/s):(infinity/FIFO)], Model III [(M/M/1):(k/FIFO)], Model IV [(M/M/s):(k/FIFO)]

Total Lecture Hours- 60

COURSE OUTCOME

Students will be able to

1. Study the Conditional Probability
2. Know Probability Distribution
3. Learn about Correlation, Regression
4. Study about Testing of Hypothesis
5. Knowing about Queuing theory

TEXT BOOK(S)

1. T Veerarajan. 2008. Probability, Statistics and Random Processes. Third Edition, Tata McGraw Hill, New Delhi.

REFERENCE BOOK(S)

1. Yuri Suhov, Mark Kelber. 2014. Probability and Statistics by Example. Cambridge University Press, USA
2. Kishor S Trivedi. 1999. Probability & Statistics with Reliability, Queuing and Computer Applications. Prentice Hall of India, New Delhi.
3. Vijay K Rohatgi, AK Ehsanes Saleh. 2015. An Introduction to Probability and Statistics, Third Edition, Wiley, New Jersey.
4. S C Gupta and V K Kapoor, 2020. Fundamental of Mathematical Statistics. Twelfth Edition, Sultan Chand & Sons
5. Rukmangadachari E. 2012. Probability and Statistics. Pearson Education in Asia.

E-RESOURCES

1. <http://www.utstat.toronto.edu/mikevans/jeffrosenthal/book.pdf>
2. <https://nlist.inflibnet.ac.in/>
3. <https://ndl.iitkgp.ac.in/>
4. <https://bsu.libguides.com/probstatistics>
5. <https://oli.cmu.edu/courses/probability-statistics-open-free/>

**SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS)**



SUNDARAKKOTTAI, MANNARGUDI- 614016.

(For the Candidates admitted in the academic year 2021 – 2022)

DEPARTMENT OF COMPUTER APPLICATIONS

MASTER OF COMPUTER APPLICATIONS (MCA)

Semester: II-EC-II:2 Optimization Techniques

Ins. Hrs./Week: 4

Course Credit: 4

Course Code: 21PCAE2B

OBJECTIVES

- To understand the basic concepts of Operations research
- To impart the knowledge on Operation research techniques and their applications
- To educate on the advancement of linear programming techniques

UNIT- I: Linear Programming (12 Hours)

Introduction – History of Operations Research-Meaning of Operations Research-Formulation of Linear Programming Models – Graphical solution – Mathematical Solutions: Simplex method – Artificial Variables method: Big-M method and Two phase method.

UNIT- II: Transportation problem (12 Hours)

Introduction to Transportation problem – North West corner rule – Least cost method – Vogel's Approximation Method – MODI's Method for Optimal solution– Assignment problem: Introduction, Hungarian Assignment method.

UNIT- III: Inventory (12 Hours)

Game theory: Rectangular games, Solution to rectangular games, Minmax-Maxmin principle – Inventory Models: Determine Models – Economic Order Quantity (EOQ) – Finite and Infinite Delivery Rates without Back – Ordering.

UNIT- IV: PERT / CPM (12 Hours)

Arrow (Network) Diagram Representation – Time estimates – Critical Path – Probability of meeting scheduled date of completion of project – Floats – Construction of Time chart and Resource Leveling.

UNIT- V: Replacement Policy (12 Hours)

Sequencing problem: 2 machines n jobs, 3 machines n jobs – Replacement Theory: Introduction – Various replacement situations – Replacement Policy – Individual Replacement Policy – Group Replacement Policy.

Total Lecture Hours- 60

COURSE OUTCOME

Students will be able to

1. Acquire the systematic understanding of optimization techniques
2. Understanding the concept of queuing models
3. Analyse and optimize the inventory systems
4. Learnt the concept of network
5. Understanding the concept of replacement theory

TEXT BOOK(S)

1. KantiSwarup, P K Gupta and Man Mohan. 2004. Twelfth Revised Edition, Operation Research. Sultan & Chand Publishers New Delhi.

REFERENCE BOOK(S)

1. Hamdy A Taha. Operations Research – An Introduction. 2005. Seventh edition, Prentice hall of India private limited, New Delhi.
2. Don T Philps, ARavindran, James J Solberg. 1976. Operations Research – Principles and Practice. John Wiley & Sons, New York, New Delhi.
3. Michael Carter, Camille C. Price, Ghaith Rabadi. 2018. Operations Research A practical Introduction. Second Edition, Chapman and Hall/CRC
4. Rama Murthy P. 2005. Operations Research. Second Edition, New Age International Publishers, New Delhi.
5. Frederick S Hillier and Gerald J. Lieberman. 2010. Operations Research. Ninth Edition, Tata McGraw Hill Education Private Limited, New Delhi.

E-RESOURCES

1. <https://www.pdfdrive.com/optimization-techniques-and-applications-with-examples-e191490412.html>
2. <https://nlist.inflibnet.ac.in/>
3. <https://nlist.inflibnet.ac.in/>
4. <https://www.informs.org/Resource-Center/Resources-for-Instructors/Resources-for-Operations-Research-Instructors>
5. <https://www.theorsociety.com/resource-centre/teaching-resources/>

SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS)



SUNDARAKKOTTAI, MANNARGUDI- 614016.

(For the Candidates admitted in the academic year 2021 – 2022)

DEPARTMENT OF COMPUTER APPLICATIONS
MASTER OF COMPUTER APPLICATIONS (MCA)

Semester: II-EC-II:3 Theory of Computation

Ins. Hrs./Week: 4

Course Credit: 4

Course Code: 21PCAE2C

OBJECTIVES

- To understand theoretical concepts of computing
- To understand theoretical concepts context-free grammars and pushdown automata
- To apply the ideas in compiler design, programming concepts and modern computer

UNIT- I: Automata Theory (12 Hours)

Set, Relation and Function– Introduction to Formal Proof– Additional Forms of proof – Inductive proofs – Alphabets, Strings and Language – Finite representation of language– Chomsky hierarchy.

UNIT- II: Finite Automata and Regular Expression (12 Hours)

Deterministic Finite Automata – Nondeterministic Finite Automata – Finite Automata with Epsilon Transitions – Regular Expression– Finite Automata and Regular Expressions– Equivalence of Regular languages.

UNIT- III: Context-Free Grammars and Pushdown Automata (12 Hours)

Context-Free Grammars – Parse Trees – Applications of Context-free Grammars– Ambiguity in Grammars and Languages – Definition of Pushdown Automata – The languages of Pushdown Automata – Equivalence of PDA and CFG –Deterministic Pushdown Automata.

UNIT- IV: Context-Free Languages and Turing Machine (12 Hours)

Definition– Languages that are and are not Context-free – Normal Forms – Pumping Lemma for Context- Free Languages – Closure and Decision Properties of Context Free Languages – Definition of Turing Machines – Computing with Turing Machine – Extensions of Turing Machine – Random Access Turing Machine – Nondeterministic Turing Machine.

UNIT- V: Undecidability and Computational Complexity (12 Hours)

The Church-Turing Thesis – Universal Turing Machine – The Halting Problem – Unsolvable Problems about Turing Machines – Class P, Class NP – NP-completeness – Computational Complexity: Space Complexity and Time Complexity.

Total Lecture Hours- 60

COURSE OUTCOME

Students will be able to

1. Understand the set theory concepts and proofing techniques
2. Construct the finite automata
3. Context free grammars and construct the pushdown automata
4. To know Turing machine

5. To identify solvable and unsolvable problems

TEXT BOOK(S)

1. J E Hopcroft, R Motwani and J.D Ullman. 2009. Introduction to Automata Theory, Languages and Computations. Second Edition, Pearson Education, London.
2. H.R.Lewis and C.H.Papadimitriou. 2007. Elements of the theory of Computation. Second Edition, Pearson Education/PHI, London.

REFERENCE BOOK(S)

1. J.Martin. 2008. Introduction to Languages and the Theory of Computation. Third Edition, TMH, New Delhi.
2. Alfred V. Aho, Monica S. Lam, Ravi Sethi, and Jeffrey D. Ullman. 2007. Compilers: Principles, Techniques, & Tools. Second Edition, Addison-Wesley, Boston, USA.
3. Michael Sipser. 2006. Theory of Computation. Second Edition, Thomson, Boston.
4. Herbert S. Wilf. 2002. Algorithms and Complexity, Second Edition, A K Peters, Ltd, Natick, USA.
5. Peter Linz. 2016. An Introduction to Formal Languages and Automata. Sixth Edition, Jones and Bartlett Publishers, Inc, USA.

E-RESOURCES

1. <https://cglab.ca/~michiel/TheoryOfComputation/TheoryOfComputation.pdf>
2. https://www.cs.virginia.edu/~robins/Sipser_2006_Second_Edition_Problems.pdf
3. http://people.math.sc.edu/mlevet/Lecture_Notes.pdf
4. <https://nlist.inflibnet.ac.in/>
5. <https://nlist.inflibnet.ac.in/>

**SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS)**



SUNDARAKKOTTAI, MANNARGUDI- 614016.

(For the Candidates admitted in the academic year 2021 – 2022)

DEPARTMENT OF COMPUTER APPLICATIONS

MASTER OF COMPUTER APPLICATIONS (MCA)

Semester: II-EDC-I:1 Internet of Things

Ins. Hrs./Week: 3

Course Credit: 2

Course Code: 21PCAED1A

OBJECTIVES

- To apply the ideas of IoT
- To appreciate IoT as a fast growing paradigm on Research in Computer Science and to use the same for research
- To understand Design Methodology

UNIT- I: IoT Technologies

(9 Hours)

Introduction – Physical design – Logical design –IoT Technologies: Wireless sensor networks – Cloud computing – Big data Analytics – Communication Protocol – Embedded Systems.

UNIT-II :IoT Architecture

(9 Hours)

Internet of Things -IoT Architecture M2M high-level ETSI architecture – IETF architecture for IoT– OGC architecture – IoT reference model – Domain model – information model – functional model – communication model – IoT reference architecture.

UNIT- III: IoT Design Methodology

(9 Hours)

Purpose & Requirement Specifications – Process Specification – Domain Model Specification – Service Specification.

UNIT- IV: IoT Framework

(9 Hours)

IoT Physical Server and Cloud Offerings: Introduction to cloud Storage Models & Communication APIs – WAMP-Python Web Application Framework – Amazon Web Service for IoT.

UNIT- V: Data Analytics for IoT

(9 Hours)

Introduction – Apache Hadoop –Using Hadoop Map Reduce for Batch Data Analysis – Apache Oozie – Apache Spark – Apache Storm-Structural Health Monitoring Case Study.

Total Lecture Hours- 45

COURSE OUTCOME

Students will be able

1. Understand IoT Technologies
2. Understand building blocks of Internet of Things and characteristics
3. Understand IoT design methodology
4. Understand the application areas of IoT
5. Understand Data Analytics

TEXT BOOK(S)

1. ArshdeepBahga, Vijay Madiseti. 2015. Internet of Things – A hands-on approach. Universities Press, India.
2. Omar Elloumi, David Bosewarthick, OlivierHersent. 2012. Internet of Things:Key Applications and Protocols. First Edition, Wiley Publication, New York, USA.

REFERENCE BOOK(S)

1. CunoPfister, 2011. Getting Started with the Internet of Things. First Edition, Maker Media.
2. Peter Waher, 2015. Learning Internet of Things. First Edition, Packt publishing, UK.
3. RajkumarBuyya, Amir VahidDastjerdi. 2016. Internet of Things: Principles and Paradigms. First Edition, Elsevier, Netherlands.
4. Milan Milenkovic. 2020. Intertnet of Things: Concepts and System Design, First Edition, Springer, Germany.
5. VlasiosTsiatsis, StamatisKarnouskos, Jan Holler, David boyle Catherine Muligan. 2018. Internet of Things: Technologies and Applications for a new age of Intelligenc. Second Edition, Academic press, USA.

E-RESOURCES

1. <http://cloudbus.org/papers/IoT-Book2016-C1.pdf>
2. <https://www.pdfdrive.com/internet-of-things-iot-in-5g-mobile-technologies-d176075929.html>
3. <https://www.upchain.com/blog/26-iot-resources/#:~:text=Arduino%20is%3A,to%2Duse%20hardware%20and%20software.&text=The%20community%20and%20blog%20are,them%20in%20no%20time%20flat.>
4. <https://www.i-scoop.eu/internet-of-things-guide/>
5. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7368922/>

**SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS)**



SUNDARAKKOTTAI, MANNARGUDI- 614016.

(For the Candidates admitted in the academic year 2021 – 2022)

DEPARTMENT OF COMPUTER APPLICATIONS

MASTER OF COMPUTER APPLICATIONS (MCA)

Semester: II-EDC-I:2 Web Design

Ins. Hrs./Week: 3

Course Credit: 2

Course Code: 21PCAED1B

OBJECTIVES

- To teach web programming using HTML and DHTML
- To design web page using HTML
- To understand VB script and Java Script, XHTML, XML and CSS

UNIT- I: HTML

(9 Hours)

Introduction to HTML – Introduction to Common HTML – Links and Addressing: Linking Basics, URLs, Linking in HTML, Anchor Attributes Images and Anchors.

UNIT- II: Layout, Table, Frame

(9 Hours)

HTML and Images – Introduction to Layout: Backgrounds and Colors and text – Layout with Tables – Layout with Frames.

UNIT- III: Style sheets and Forms

(9 Hours)

Style sheets: Style Sheet Basics, Example, Properties, Positioning with Style sheet – HTML Forms: The Form Element, Form Controls, New and Emerging form elements, Special form Considerations for Web TV, Forms and Events.

UNIT- IV: Scripting language

(9 Hours)

Introduction to Scripting and HTML: The Purpose of Scripting, Java Script, VB Script, Including Scripts in an HTML Document, Form Validation in Java Script – DHTML.

UNIT- V: Introduction to Server-side programming and XML

(9 Hours)

Introduction to Server-side programming: Overview of Client/Server programming on the web, server-side programming – Common Gateway Interface – XML: Basic XML, Way to use XML.

Total Lecture Hours- 45

COURSE OUTCOME

Students will be able to

1. Understand introduction of HTML
2. Design web pages using HTML
3. Use VB Script, Javascript
4. Apply Cascade Style Sheet.
5. Write server-side program using XML

TEXT BOOK(S)

1. Thomas A.Powell. 1999. The Complete Reference HTML. Second Edition, Tata McGraw-Hill, New Delhi.

REFERENCE BOOK(S)

1. Thomas A. Powell. 2010. HTML &CSS :The Complete Reference. Fifth Edition, McGraw-Hill Professional, USA.
2. Elizabeth Castro. 2006. HTML, XHTML, & CSS: Visual Quick Start Guide, Sixth Edition, Peachpit Press, USA.
3. Bill Kennedy, Chuck Musciano. 1998. HTML: The Definitive Guide, Third Edition, O'Reilly Media, USA.
4. J.D Gauchat. 2017. HTML5 for Masterminds. Third Edition, Createspace independent publishing, California, USA.
5. Bob Terrell. 2019. Creating Data-Driven Web Sites: An Introduction to HTML. Momentum Press, New York, USA.

E-RESOURCES

1. https://www.w3schools.com/html/html_intro.asp
2. https://www.w3schools.com/html/html_tables.asp
3. https://www.w3schools.com/html/html_images.asp
4. https://www.w3schools.com/html/html_css.asp
5. https://www.w3schools.com/html/html_scripts.asp
