YADAVA COLLEGE (AUTONOMOUS)

DEPARTMENT OF COMPUTER SCIENCE

Under Graduate Course

Choice Based Credits System Syllabus

(2022 - 2023)

PROGRAM OUTCOMES (PO)

- Understand the basic and advanced concept of computer science and adopt recent industrial program coding.
- Analyze the real-time concept of mathematical oriented concepts.
- Apply the knowledge of the hardware of the computer.
- Implement and independent project of the student community
- Prepare themselves with an Empowered efficient and proper attitude and interact completely and manage as a company.
- Create and apply suitable methods, resources and state of the IT tools with the awareness of the boundaries.
- Capability to be an effective member of a software industry, computing profession.
- Ability to design, implement and evaluate computational system to meet constraints.

PROGRAM SPECIFIC OUTCOMES (PSO)

- Quire scholarly merit with a qualified skill for higher studies.
- Achieve greater heights in various sectors of software industry.
- Analyze and administer computing practices to succeed as an employee or an entrepreneurial career.
- Ethically and professionally pledged with the strength to relate computer applications to a more immense communal context for the growth of the nation.
- Create, select, and apply modern tools and techniques to analyze and develop a successful software system.
- Ability to design, Analyze precise specifications of Algorithms and Procedures.
- Capable to develop programming languages and its tools.
- Effective performance as an individual and as a member or a leader in a multi disciplinary team to build software applications.

DEPARTMENT OF COMPUTER SCIENCE YADAVA COLLEGE

CHOICE BASED CREDITS SYSTEM SYLLABUS PLAN

UNDER GRADUATE PROGRAMME

2022 – 2023

Semester	Part Code	Subject Code	Title of the Paper	Teaching	
				Hours	Credits
I	I		Tamil	5	3
	II		English	5	3
	Core - I		Programming in C	4	4
	Core - II		Digital Computer Fundamentals	4	4
	Core - III		**Practical - I:** C Programming Lab	4	2
	Allied – I		Probability and Statistics	4	3
	IV ENS		Environmental Studies	2	2
	IV SBE		Skill Based Elective	2	2
			TOTAL	**30**	**23**
II	I		Tamil	5	3
	II		English	5	3
	Core – IV		Data Structures and Algorithms	4	4
	Core - V		**Practical – II:** Data Structure using C++ Lab	4	2
	Elective – I		1. Multimedia 2. Network Security 3. Software Testing	4	4
	Allied - II		Discrete Mathematics	4	3
	IV VAE		Value Education	2	2
	IV SBE		Skill Based Elective	2	2
			TOTAL	**30**	**23**
III	I		Tamil	5	3
	II		English	5	3
	Core – VI		Operating Systems	4	4
	Core – VII		.Net Technologies	4	4
	Core – VIII		**Practical – III:**.Net Technologies Lab	4	2
	Allied – III		Numerical Methods	4	3
	IV NME		Non-Major Elective **(Web Programming)**	2	2
	IV SBE		Skill Based Elective	2	2
			TOTAL	**30**	**23**

Semester	Part Code	Subject Code	Title of the Paper	Teaching	
				Hours	Credits
IV	**I**		Tamil	5	3
	II		English	5	3
	Core - IX		Programming in Java	6	6
	Core - X		**Practical – IV:** Java Programming Lab	6	3
	Allied - IV		Operations Research	4	3
	IV NME		Non-Major Elective **(Oracle)**	2	2
	IV SBE		Skill Based Elective	2	2
			TOTAL	**30**	**22**
V	**Core – XI**		Web Technology	6	6
	Core – XII		Computer Networks	6	6
	Core - XIII		**Practical V** – Web Technology Lab	10	5
	Elective - II		1.PHP Programming 2.Wireless Network 3.Data Mining and Warehousing	6	5
	IV SBE		Skill Based Elective	2	2
			TOTAL	**30**	**24**
VI	**Core – XIV**		Programming in Python	5	5
	Core – XV		Relational Database Management Systems	5	5
	Core – XVI		**Practical VI** – Python Programming Lab	6	3
	Core – XVII		**Practical VII -** SQL and PL/SQL	6	3
	Elective III		1. Software Engineering 2. E- Commerce Technologies 3. Mini Project	6	6
	IV SBE		Skill Based Elective	2	2
			TOTAL	**30**	**24**
	V		PE/NCC/NSS/EXT	--	1
Total				**180**	**140**

YADAVA COLLEGE (AUTONOMOUS) MADURAI – 14

BLUE PRINT OF THE CHOICE BASED CREDITS SYSTEM DISTRIBUTION OF NUMBER OF PAPERS **(No)**, HOURS **(Hr)**, AND CREDITS **(Cr)**

Under Graduate (UG) COURSE

B.Sc COMPUTER SCIENCE

Subject		Semester I			Semester II			Semester III			Semester IV			Semester V			Semester VI			Total	
		No	Hr	Cr	No	Hr	Cr	No	Hr	Cr	No	Hr	Cr	No	Hr	Cr	No	Hr	Cr	Hr	Cr
Part I	Tamil	1	5	3	1	5	3	1	5	3	1	5	3	--	--	--	--	--	--	20	12
Part II	English	1	5	3	1	5	3	1	5	3	1	5	3	--	--	--	--	--	--	20	12
Part III	Core	3	12	10	2	8	6	3	12	10	2	12	9	3	22	17	4	22	16	90	68
	Allied I	1	4	3	1	4	3	1	4	3	1	4	3	--	--	--	--	--	--	16	12
	Project/ Elective/ Allied	--	--	--	1	4	4	--	--	--	--	--	--	1	6	5	1	6	6	16	15
Part IV	ENS	1	2	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2	2
	VAE	--	--	--	1	2	2	--	--	--	--	--	--	--	--	--	--	--	--	2	2
	NME	--	--	--	--	--	--	1	2	2	1	2	2	--	--	--	--	--	--	4	4
	SBE	1	2	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2	2	12	12
Part V	PE/NCC/ NSS/EXT	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	--	1
Total Papers and Hours per Semester		08	30	23	08	30	23	08	30	23	07	30	23	05	30	23	06	30	25	180	140
Self Study Paper Extra Credits		--	--	--	--	--	--	01	--	03	01	--	03	01	--	03	01	--	03	--	12
TOTAL		**08**	**30**	**23**	**08**	**30**	**23**	**08**	**30**	**23**	**07**	**30**	**23**	**05**	**30**	**23**	**06**	**30**	**25**	**180**	**152**

CORE - I
PROGRAMMING IN C

Semester : I	**Total Hours/ Semester :60**
Subject Code :	**Hours of Teaching/Week :4**
	Credits :4

Objectives

This course will enable the student to understand the concept of C Programming language and gain knowledge and Algorithms, Flowcharts and Logical Thinking. On successful completion of this course, the student will have the programming ability in C Language and develop software Applications using C.

UNIT – I **(15 Hours)**

Overview of C: History of C - Importance of C - Basic Structures of C Programs - Programming Style.

Constants, Variables and Data Types: Character Set - C Tokens - Keywords and Identifiers – Constants – Variables - Data Types - Declaration of Variables - Defining Symbolic Constants.

Operators and Expressions: Arithmetic Operators - Relational Operators - Logical Operators - Assignment Operators - Increment and Decrement Operators - Conditional Operator - Bitwise Operators - Special Operators - Arithmetic Expressions - Evaluation of Expressions -Precedence of Arithmetic Operators - Type conversions in Expressions - Operator Precedence and Associativity - Mathematical Functions.

Outcomes

- Recognize the basic Data types and Operators.

UNIT – II **(10 Hours)**

Managing Input and Output Operations: Reading a Character - Writing a Character - Formatted Input - Formatted Output.

Decision Making and Branching: Decision Making with If Statement - Simple If Statement - The If…Else Statement - Nesting of If…Else Statements - The Else…If Ladder - The Switch Statement – The ?: operator.

Decision Making and Looping: The While Statement - The Do Statement - The For Statement - Jumps in Loops.

Outcomes

- Learn the concept of Input / Output operations and control statements

UNIT – III **(10 Hours)**

Arrays: One-Dimensional Arrays - Two Dimensional Arrays - Initializing Two Dimensional Arrays - Multidimensional Arrays.

User– Defined Functions: Need for User-Defined Functions - A Multi-Function Program - Return Values and their Types - Functions Calls - Category of Functions - No Arguments and No Return Values - Arguments but No Return Values - Arguments with Return values - Nesting of Functions – Recursion-Passing Arrays to Functions - The Scope, Visibility and Lifetime of Variables.

Outcomes

- Identify the usage of Arrays and Functions.

UNIT – IV **(15 Hours)**

Structures and Unions: Defining a Structure - Declaring Structure Variables - Structure Initialization – Copying and Comparing Structure variables - Arrays of Structures - Arrays within Structures - Structures within Structures – Structures and Functions – Unions - Size of Structures - Bit Fields.

Pointers: Understanding Pointers - Accessing the Address of a Variable - Declaring Pointer Variables - Initialization of Pointer Variable - Accessing a variable through its Pointer - Pointer Expressions - Pointer increments and Scale Factor - Pointers and Arrays - Pointers and Character Strings - Pointers to Functions - Pointers and Structures.

Outcomes

- Analyze the features of structures, union and pointers.

UNIT – V **(10 Hours)**

File Management in C: Defining and opening a File - Closing a File - Input / Output Operations on Files - Error handling during I/O operations - Random Access to Files - Command Line Arguments.

Dynamic Memory Allocation: Dynamic Memory Allocation - Allocating a Block of Memory - Allocating a Multiple Blocks of Memory - Releasing the Used Space - Altering the size of a Block.

The Preprocessor: Macro Substitution - File Inclusion - Compiler Control Directives.

Outcomes

Develop programs using File Management, Dynamic Memory Allocation.

Pedagogy: Chalk & Talk, Assignment, Group Exercises and PPT.

Teaching Methods

Units	Hours	Mode Pedagogy
I	15	Chalk & Talk
II	10	Chalk & Talk
III	10	Chalk & Talk, Assignment
IV	15	Group Exercises
V	10	PPT

Text Book / Book for Study

1. **"Programming in ANSI C", E.Balagurusamy,** McGraw Hill Education, Sixth Edition.

Books for Reference

1. **"Programming with C"** Byron Gottfried, Tata McGraw Hill Publishing Company

Web References

1. https://www.cprogramming.com/tutorial/c-tutorial.html?inl=nv

Name of the Course Designer

1. **Mr.R.Shanmugaraj**, Lecturer, Department of Computer Science, Yadava College – Madurai

2. **Mrs.A.Priyanka**, Lecturer, Department of Computer Science, Yadava College - Madurai

CORE - II
DIGITAL COMPUTER FUNDAMENTALS

Semester	**: I**	**Total Hours/ Semester**	**:60**
Subject Code	**:**	**Hours of Teaching/Week**	**:4**
		Credits	**:4**

Objectives

The course will enable the student to understand the fundamentals of Digital Principles and gain knowledge and computer fundamentals and its design. This will also familiarize the student in the concepts of Gates, Boolean Algebra, K – Map and Flip – Flops.

UNIT I

Number Systems and Discrete Logic: Why Binary – Binary to Decimal- Decimal to Binary – Octal –Hexa Decimal – Binary Addition- Binary Subtraction- 2's & 1's complement representation - ASCII code –Excess 3 code – Gray code-Transistor inverter.

Logic Gates: OR Gate- And gate-Not gate – **Universal gates:** NOR gate-NAND gate - Boolean algebra.

Outcome

- Identify the logic Gates and their Functionality.

UNIT II

Circuit Analysis and Design Boolean Law and Theorems - Sum of Product method-K-Map truth tables-Pairs, Quads, Octets – K-Map simplifications – Don't Care –Product of Sum method-Product of Sum simplifications.

Outcome

- Solve the Expression using Boolean Laws and Theorems. Analyze the concept of K – Map method.

UNIT III

Data Processing and Arithmetic Circuits: Multiplexers - De-Multiplexers-1-of-16 Decoders-BCD to Decimal Decoders-7 segment Decoders-Encoders - Octal to Binary Encoder – Decimal to BCD Encoder – Priority Encoder.

Outcome

- Carry out the Basics of Multiplexers and Encoder, Decoder.

UNIT IV

Flip-Flops, Clocks and Timers: RS Flip-flop-D Flip-flop-JK Flip-flop-JK Master Slave Flip-flop – 555 Timer Astable-555 Timer Mono stable.

Outcome

- Identify the Flip Flops and their Functionality.

UNIT V

Shift Registers and Counters: Types of Registers-Serial in serial out – Serial in Parallel out- Parallel in serial out- Parallel in Parallel out- Asynchronous Counter - Synchronous Counter- MOD-3 Counter.

Outcome

- Recognize the functions of Counters.

Pedagogy : Chalk & Talk, Assignments, Group Exercises and PPT.

Teaching Method

Units	Hours	Mode Pedagogy
I	12	Chalk & Talk
II	14	Chalk & Talk, Assignment
III	11	Chalk & Talk
IV	11	Group Exercise
V	12	PPT

Text Book / Book for Study

1. "Digital Principles and Applications", Albert Paul Malvino & Donald P.Leach,Tata Mc Graw Hill
2. "Digital Circuits and Design", S. Salivahanan, S. Arivazhagan, 2nd Edition

Books for Reference

1. V.Rajaraman and T.Radhakrishnan, *Digital Computer Design*, Prentice Hall of India, 2001

Web References

1. https://soaneemrana.org/onewebmedia/DIGITAL%20PRINCIPLES%20AND%20APPLICATION%20BY%20LEACH%20&%20MALVINO.pdf

Name of the Course Designer

1. **Mr. S.Saravanapandian**, Lecturer, Department of Computer Science, Yadava College – Madurai
2. **Mr. M. Kaleeswaran**, Lecturer, Department of Computer Science, Yadava College – Madurai

CORE III - Lab
Course Title: C PROGRAMMING LAB

Semester : I	**Total Hours/ Semester :60**
Subject Code :	**Hours of Teaching/Week :4**
	Credits :2

Objectives

- To provide the hands on Experience on C Programming and improve the practical skill set. To know the steps involved in Compiling, Linking and Debugging C. To develop the logic for the given problem, recognize and understand the syntax and Construction of C code.

1. Write a C program to find Sine Series.
2. Write a C program to find Fibonacci series.
3. Write a C program to find Prime number.
4. Write a C program to sort an Array.
5. Write a C program to search an element.
6. Write a C program to find Adam number.
7. Write a C program to find sum of digits.
8. Write a C program to find Factorial value, Fibonacci, GCD Value (Recursion).
9. Write a C program to find Matrix Addition.
10. Write a C program to find Transpose of a Matrix.
11. Write a C program to find Character day of a week-Switch.
12. Write a C program to find Quadratic Equation-Switch.
13. Write a C program to find Frequency of a number-Function.
14. Write a C program to find NCR Value- Function.
15. Write a C program to find Pay Bill.
16. Write a C program to find Mark sheet.
17. Write a C program to find EB Bill.

Pedagogy : Systems, Internet, Group Exercises and PPT.

Name of the Course Designer

1. **Mr.S.Saravanapandian**, Lecturer, Department of Computer Science, Yadava College – Madurai
2. **Ms. R.Beulah**, Assistant Professor, Department of Computer Science, Yadava College – Madurai

Part – III: Allied - I
Allied Title: PROBABILITY AND STATISTICS

Semester : I	**Total Hours/ Semester :60**
Subject Code :	**Hours of Teaching/Week :4**
	Credits :3

Objectives

- The main objective of this course is to provide student with the foundation of probability and statistics, analyze most used valid – Applications and gain knowledge in Rank Cormrelation and Normal Distribution and CBI to FBI Conversion.

UNIT – I **(12 Hours)**

Curve fitting – Principles of Least Squares – Fitting Straight line - A Second Degree Parabola

Outcomes

- To learn about the curve fitting and principles of least squares.

UNIT – II **(11 Hours)**

Correlation – Rank Correlation – Regression Lines

Outcomes

- Find out the equation of curve fitting and second degree parabola.

UNIT – III **(12 Hours)**

Probability -Conditional probability- Bay'es theorem

Outcomes

- Definition of correlation.

UNIT – IV **(14 Hours)**

Random Variable - Discrete Random Variable - Continues Random Variable - Probability Density Function-Binomial Distribution-poison Distribution - Normal Distribution

Outcomes

- Create the rank correlation using formula.

UNIT – V **(11 Hours)**

Index numbers – Aggregate – Average of Price Relative – Weighted Index Number – Weighted Average of Price Relative – Cost of Living Index - Number – Conversion of CBI to FBI.

Outcomes

- To learn about the two line of regression, random variables and Index Numbers

Pedagogy : Chalk & Talk, Assignments, Group Exercises.

Teaching Method

Units	Hours	Mode Pedagogy
I	**12**	Chalk & Talk
II	**11**	Chalk & Talk
III	**12**	Chalk & Talk, Group Exercise
IV	**14**	Chalk & Talk
V	**11**	Chalk & Talk, Assignment

Text Book/Book for study(s)

1. **"Mathematical Statistics",** Kapoor & Saxena, S.Chand & Sons, NewDelhi.

Books for Reference

1. **"Statistics",** Arumugam & Isaac, New Gamma Publishing House, Palayamkottai.
2. **"Statistics",** S.P.Gupta, S.Chand & Sons
3. **"Introduction to Mathematical Statistics",** Robert.V, Hogg &Allen T.Craig, Collier, Macmillan International Edition.

Web References

1. https://onlinestatbook.com/Online_Statistics_Education.pdf
2. https://www.dcpehvpm.org/E-Content/Stat/FUNDAMENTAL%20OF%20MATHEMATICAL%20STATISTICS-S%20C%20GUPTA%20&%20V%20K%20KAPOOR.pdf

Name of the Course Designer

1. **Mr.T.Vasanthakumar**, Lecturer, Department of Mathematics, Yadava College – Madurai.

CORE - IV
Course Title: DATA STRUCTURES AND ALGORITHMS

Semester : II	**Total Hours/ Semester :60**
Subject Code :	**Hours of Teaching/Week :4**
	Credits :4

Objectives

This course is designed to develop skills, to design and analyze simple linear and non – linear data structure and to apply appropriate problem solving it enables them to gain knowledge in practical applications of data structures.

UNIT I **(14 Hours)**

Tokens, expressions and control structures: tokens – keywords – identifiers and constants – basic data types - user – defined data types – reference variables – operator in C++ - scope resolution operators – manipulators. **Function in C++:** function prototyping – call by reference - return by reference – inline functions – default arguments – recursion – function overloading.

Class and objects: specifying a class – defining member function – a C++ program with class – making an outside function – nesting of member functions – private member functions – arrays within a class – static data members – static member functions – friendly functions. **Constructors and destructors:** constructors – parameterized constructor – multiple constructors in a class – constructors default arguments – copy constructor – destructors.

Outcomes

- Ability to choose appropriate data structures like tokens, classes and objects, constructors and destructors.

UNIT II **(12 Hours)**

Operator overloading type conversion: defining operator overloading – overloading unary operators – overloading binary operator – overloading binary operator using friends.

Inheritance extending classes: single inheritance – multilevel inheritance – multiple inheritance – hierarchical inheritance – hybrid inheritance – virtual base classes – abstract classes. **Pointers, virtual functions and polymorphism:** pointers of objects – this pointer – virtual functions – pure virtual functions. **Working with files:** opening and closing a file – detecting end – of – file – more about open (): file modes – file pointers and their manipulations. **Templates:** class templates - class templates with multiple parameters – function templates.

Outcomes

- Understand the concept of operator overloading, type conversion, pointers, virtual functions and working with files.

UNIT III **(11 Hours)**

Introduction and Overview: Introduction- Basic Terminology; Elementary Data Organization – Data Structures- Data Structure Operations.

Arrays: Linear Arrays- Representation of Linear Arrays in Memory- Traversing Linear Arrays- Inserting and Deleting- Searching; Linear Search- Binary Search

Linked List: Linked Lists- Representation of Linked Lists in Memory- Traversing a Linked List- Searching a Linked List- Insertion into a Linked List- Deletion from a Linked List- Two – way Lists.

Outcomes

- Understand basic data structure such as arrays, linked list, linear search and binary search.

UNIT IV **(11 Hours)**

Stacks, Queues, Recursion: Stacks- Array Representation of Stacks- Linked Representation of Stacks- Arithmetic Expressions; Polish Notation- an Application of Stacks- Recursion- Queues- Linked Representation of Queues- Dequeues.

Trees: Binary Trees- Representing Binary Trees in Memory- Traversing Binary Trees- Traversal Algorithms using Stacks- Binary Search Trees- Searching and Inserting in Binary Search Trees- Deleting in a Binary Search Tree.

Outcomes

- Ability to design program using variety of data structures like stacks, queues and Binary Search Trees.

UNIT V **(12 Hours)**

Graphs and their Applications: Introduction- Graph Theory Terminology- Sequential Representation of Graphs; Warshall's Algorithm; Shortest Paths.

Sorting: Introduction- Sorting- Bubble Sort-Insertion Sort- Selection Sort- Merge-Sort- Radix Sort.

Outcomes

- Demonstrate to understand various sorting algorithms including bubble, insertion, select, merge and radix sortes.

Pedagogy : Chalk & Talk, Assignments, Group Exercises and PPT.

Teaching Method

Units	Hours	Mode Pedagogy
I	**14**	Chalk & Talk
II	**12**	Chalk & Talk
III	**11**	Chalk & Talk, Group Exercise
IV	**11**	Chalk & Talk, Assignment
V	**12**	PPT

Text Book

1. **"Object Oriented Programming with C++",** E.Balagurusamy, Fifth Edition, Tata McGraw-Hill.
2. **"Data Structures",** Seymour Lipschutz, Indian Adapted Edition 2006, Sixteenth reprint, Tata McGraw-Hill Companies.

Books for Reference

1. Introduction to Algorithms – Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein

2. Data Structures and Algorithms in C++ - Adam Drozdek

Web References

1. https://www.javatpoint.com/data-structure-tutorial
2. https://www.techtarget.com/searchdatamanagement/definition/data-structure

Name of the Course Designer

1. Dr. G. Marimuthu, Assistant Professor & Head, Department of Computer Science, Yadava College – Madurai

2. Mr.M.Kaleeswaran, Lecturer, Department of Computer Science, Yadava College – Madurai.

CORE – V LAB
Course Title: DATA STRUCTURES USING C++ LAB

Semester : II	**Total Hours/ Semester :60**
Subject Code :	**Hours of Teaching/Week :4**
	Credits :2

Objectives

To impart the knowledge of Object Oriented Programming Concepts and to implement in C++. To enable to differentiate procedure oriented and object oriented concepts. To enhance the basic concepts of Stacks, Queues, Linked List, Trees and Sorting.

C++

1. Simple C++ program using class
2. Write a C++ Program to implement inheritance & virtual function
3. Write a C++ Program to implement multiple inheritance
4. Write a C++ Program to implement multilevel inheritance
5. Write a C++ Program to implement hybrid inheritance
6. Write a C++ Program to implement hierarchical inheritance
7. Write a C++ Program to implement operator overloading (+,*,/,-)
8. Write a C++ Program to implement '++' operator to overload
9. Write a C++ Program to implement friend function
10. Write a C++ Program to implement constructor & destructor
11. Write a C++ Program to implement function overloading
12. Write a C++ Program to Process student's mark list using file
13. Write a C++ Program to Process library maintenance using file
14. Write a C++ Program to implement matrix addition using operator overloading
15. Write a C++ Program to implement matrix multiplication using operator overloading

Data Structures using C++

1. Write a C++ Program to create singly linked List
2. Write a C++ Program to ADD, DELETE Elements from singly Linked List
3. Write a C++ Program to create Doubly linked List
4. Write a C++ Program to ADD, DELETE, Elements from Doubly Linked List
5. Write a C++ Program to create circular Linked List
6. Write a C++ Program to ADD, DELETE, Elements in Circular Linked List
7. Write a C++ Program to create Stack using Pointer
8. Write a C++ Program to implement Stack operations
9. Write a C++ Program to create Queue using pointer
10. Write a C++ Program to implement Queue Operations
11. Write a C++ Program to implement Various Tree Traversal using Pointer
12. Write a C++ Program to perform Linear Searching and Binary Searching of Numbers and Strings
13. Write a C++ Program to perform Sorting (Bubble, Insertion, and Selection) Techniques of numbers, character values and String.

Pedagogy : Systems, Internet, Group Exercises and PPT.

Name of the Course Designer

1. **Dr. G. Marimuthu, Assistant Professor & Head,** Department of Computer Science, Yadava College – Madurai

2. **Mrs.S.Anu**, Lecturer, Department of Computer Science, Yadava College – Madurai.

Part – III: ALLIED - II
Allied Title: DISCRETE MATHEMATICS

Semester : II	**Total Hours/ Semester :60**
Subject Code :	**Hours of Teaching/Week :4**
	Credits :3

Objectives

Introduce the concept of set theory, logic, lattices provide a survey of discrete mathematics, the study of finite automata in NDFA, equivalence of FA and NFA.

UNIT I **(11 Hours)**

Set Theory: Introduction – Sets – Notation and description of sets – Subsets – Venn – Euler diagram – Operation on sets – Properties of set operation – Verification of the basic laws of algebra by Venn diagram

Outcome

- Introduce the concept of set theory, notation and description of sets, verification of the basic laws of algebra by venn diagram.

UNIT II **(11 Hours)**

Logic : Introduction – TF statement-Connectives-Atomic and compound statement – well formed formula – Truth table of a formula – Tautology implication and equivalence of formula – Replacement process

Outcome

- Ability to apply mathematical logic to solve problems and TF statement.

UNIT III **(12 Hours)**

Lattices: Some properties of lattices – New lattice – Modular and distributive – lattices – Boolean algebra

Outcome

- Evaluate properties of lattices and Boolean Algebra

UNIT IV **(14 Hours)**

Introduction – Matrix operations – Inverse of a Square Matrix – Elementary operations and Rank of a Matrix - Eigen values and Eigen Vectors.

Outcome

- Ability to apply matrix operations, Eigen values and vectors.

UNIT V **(12 Hours)**

Introduction-Finite Automata-Definition of Finite automaton – representation of finite automaton – acceptability of a string by a finite automaton – language accepted by a finite automaton – non deterministic finite automata – acceptability of a string by a non deterministic finite automata – equivalence of FA and NFA – procedure of finding FA equivalent a given NFA

Outcome

- Evaluate finite automata, FA and NFA.

Pedagogy : Chalk & Talk, Assignments, Group Exercises.

Teaching Method

Units	Hours	Mode Pedagogy
I	**11**	Chalk & Talk
II	**11**	Chalk & Talk
III	**12**	Chalk & Talk
IV	**14**	Chalk & Talk, Group Exercise
V	**12**	Chalk & Talk, Assignment

Text Book(s)

1. **"Discrete Mathematics",** *M.K.Venkata Raman, N.Sridharan, N.Chandra sekaran, National Publishing Company, Chennai.*

UNIT I - Chapter 1 (1 to 8)
UNIT II - Chapter 9 (1 to 9)
UNIT III - Chapter 10 (1 to 5)
UNIT IV - Chapter 6 (1 to 5, 7)
UNIT V - Chapter 12 (1 to 10)

Books for Reference

1. **Discrete Mathematics –** P.Geetha – Scitech Publication 2007
2. **Discrete Mathematics –** Dr.A.Singaravelan, Dr.V.Ravichadran, Dr.T.N.Shanmugam – Meenakshi Agency – 2007

Web References

1. **https://w3.cs.jmu.edu/bernstdh/web/common/references/discrete_math.php**
2. **https://mathworld.wolfram.com/DiscreteMathematics.html**

Name of the Course Designer:

1. **Mr.T.Vasanthakumar**, Lecturer, Department of Mathematics, Yadava College – Madurai

Elective – I
MULTIMEDIA

Semester : II	**Total Hours/ Semester :60**
Subject Code :	**Hours of Teaching/Week :4**
	Credits :4

Objectives

To educate the students about the basic concepts of Multimedia, work with images, concept of animation, planning and costing.

UNIT I **(12 Hours)**

Introduction: Objectives – Brief History of Multimedia – What is Multimedia? – The Multimedia market.

Resource for Multimedia Developers: Magazines and periodicals – vendors and trade shows – Internet – Education – Experience – Critical Attitude.

Products and Evaluation

The Multimedia Development Team: Assembling a Multimedia Production Team

Outcome

- Understand the concept and History of Multimedia

UNIT II **(12 Hours)**

Hardware - Operating Systems and Soft wares

Outcome

- Analyze the concepts of Hardware, Software and Operating Systems.

UNIT III **(12 Hours)**

Graphics – Digital Audios.

Outcome

- Improve the knowledge of digital audio concepts

UNIT IV **(12 Hours)**

Digital Video and Animation - Authoring Tools.

Outcome

- Analyze Animation with special effects.

UNIT V **(12 Hours)**

Flash 5.0: Understanding the flash Frame Work – Exploring the Interface – Using Tools Naai of Action and Viewing Drawing in Flash – Animation in Flash – Using Bit Maps and others Media with Flash

Outcome

- Learn the concepts of Flash, Framework.

Pedagogy : Chalk & Talk, Assignments, Group Exercises and PPT.

Teaching Method

Units	Hours	Mode Pedagogy
I	**12**	Chalk & Talk
II	**12**	Chalk & Talk
III	**12**	Chalk & Talk, Assignments
IV	**12**	Group Exercise
V	**12**	PPT

Text Book(s)

1. **"Multimedia Technology and Applications"**, *David Hillman, Galgotia Publications pvt Ltd.*
2. ***Flash 5 Bible****, Robert Reinhar & and Jon Warrer Lantz*

1. **"Multimedia Technology and Applications"**, *David Hillman, Galgotia Publications pvt Ltd.*

UNIT I Chapter 1
Chapter 2
UNIT II Chapter 3
UNIT III Chapter 5
Chapter 6
UNIT IV Chapter 7
Chapter 9

2. **Flash 5 Bible,** *Robert Reinhar & and Jon Warrer Lantz*

UNIT V Chapter 1
Chapter 2
Chapter 3
Chapter 11
Chapter 12

Books for Reference

"Multimedia making it work", Tay Vaughan, Osborne, Mc Graw Hill.

Web References

1. https://www.tutorialspoint.com/multimedia/multimedia_introduction.htm
2. https://www.tutorialspoint.com/multimedia/multimedia_introduction.htm

Name of the Course Designer

1**. Ms.R.Beulah**,Assistant Professor, Department of Computer Science, Yadava College – Madurai.
2. **Mrs.J.Prathiba**, Lecturer, Department of Computer Science, Yadava College – Madurai.

Elective – I
NETWORK SECURITY

Semester	**: II**	**Total Hours/ Semester**	**:60**
Subject Code	**:**	**Hours of Teaching/Week**	**:4**
		Credits	**:4**

COURSE OBJECTIVES

Educating the students about how to work number theory, concepts of network security and to know the concept of authentication requirement, authentication applications.

UNIT I **10 Hours**

Model of Network Security: Model of network security – Security attacks, services and attacks – OSI security architecture – Classical encryption techniques – SDES – Block cipher Principles-DES – Strength of DES – Block cipher design principles – Block cipher mode of operation – Evaluation criteria for AES – RC4 - Differential and linear cryptanalysis – Placement of encryption function – traffic confidentiality.

Outcome

- Ability to understand the concept of Security Attacks, Block Cipher, DES

UNIT II **10 Hours**

Number Theory: Number Theory – Prime number – Modular arithmetic – Euclid‟s algorithm - Fermet‟s and Euler‟s theorem – Primality – Chinese remainder theorem – Discrete logarithm – Public key cryptography and RSA – Key distribution – Key management – Diffie Hellman key exchange – Elliptic curve cryptography.

Outcome

- Ability to understand the Number Theory, RSA, Key Management

UNIT III **15 Hours**

Authentication Requirement: Authentication requirement – Authentication function – MAC – Hash function – Security of hash function and MAC – SHA - HMAC – CMAC – Digital signature and authentication protocols – DSS.

Outcome

- Understanding the concept of Authentication, Digital Signature

UNIT IV **15 Hours**

Authentication Applications: Authentication applications – Kerberos – X.509 Authentication services - E- mail security – IP security - Web security.

Outcome

- Understanding the Authentication Applications, Kerberos, Email Security

UNIT V **10 Hours**

Intruder and Virus: Intruder – Intrusion detection system – Virus and related threats – Countermeasures – Firewalls - design principles – Trusted systems – Practical implementation of cryptography and security

Outcome

- Understand the Firewalls, virus threats, security

Pedagogy : Chalk & Talk, Assignments, Group Exercises and PPT.

Teaching Method

Units	Hours	Mode Pedagogy
I	**10**	Chalk & Talk
II	**10**	Chalk & Talk
III	**15**	Chalk & Talk, Assignments
IV	**15**	Group Exercise
V	**10**	PPT

TEXT BOOK

1. William Stallings, "Cryptography & Network Security", Pearson Education,Fourth Edition 2010.

REFERENCE BOOKS

1. Charlie Kaufman, Radia Perlman, Mike Speciner, "Network Security, Private communication in public world", PHI Second Edition, 2002.

Web Reference

www.cisco.com/c/en_in/products/security/what-is-network-security.html

Name of the Course Designer

1**. Dr. G. Marimuthu, Assistant Professor & Head,** Department of Computer Science, Yadava College – Madurai

2. **Mr.S.Saravanapandian**, Lecturer, Department of Computer Science, Yadava College – Madurai.

Elective – I
SOFTWARE TESTING

Semester : II	**Total Hours/ Semester :60**
Subject Code :	**Hours of Teaching/Week :4**
	Credits :4

OBJECTIVES

Educating the students how to work in software path and testing, concepts of software productivity and quality, concept of data flow, Provides the details in software metrics.

UNIT – I **10 Hours**

Introduction: Introduction: Purpose – Productivity and Quality in Software – Testing Vs Debugging – Model for Testing – Bugs – Types of Bugs – Testing and Design Style.

Outcome

- Understand the concept of Model Testing, Testing and Design style.

UNIT – II **10 Hours**

Graphs and Path Testing: Flow / Graphs and Path Testing – Achievable paths – Path instrumentation – Application – transaction Flow Testing Techniques.

Outcome

- Understanding the concept of Graphs, Path instrumentation and testing techniques.

UNIT – III **15 Hours**

Data Flow: Data Flow Testing Strategies - Domain Testing: Domains and Paths – Domains and Interface Testing.

Outcome

- Ability to apply Domain Testing, Interface Testing

UNIT – IV **15 Hours**

Linguistic: Linguistic –Metrics – Structural Metric – Path Products and Path Expressions. Syntax Testing – Formats – Test Cases.

Outcome

- Understand the concept of Linguistic, Path Expressions.

UNIT – V **10 Hours**

Decision Tables: Logic Based Testing – Decision Tables – Transition Testing – States, State Graph, State Testing.

Outcome

- Understand the concept of Logic Based Testing, Decision Tables.

Pedagogy : Chalk & Talk, Assignments, Group Exercises and PPT.

Teaching Method

Units	Hours	Mode Pedagogy
I	**10**	Chalk & Talk
II	**10**	Chalk & Talk
III	**15**	Chalk & Talk, Assignments
IV	**15**	Group Exercise
V	**10**	PPT

TEXT BOOKS

1. B. Beizer, "Software Testing Techniques", II Edn., DreamTech India, New Delhi, 2003.
2. K.V.K. Prasad , "Software Testing Tools", DreamTech. India, New Delhi, 2005.

REFERENCE BOOKS

1. I. Burnstein, 2003, "Practical Software Testing", Springer International Edn.
2. E. Kit, 1995, "Software Testing in the Real World: Improving the Process", Pearson Education, Delhi.
3. R.Rajani, and P.P.Oak, 2004, "Software Testing", Tata Mcgraw Hill, New Delhi.

Web Reference

https://www.guru99.com/software-testing.html

Name of the Course Designer

1.**Mr. M.Kaleeswaran**, Lecturer, Department of Computer Science, Yadava College – Madurai.
2**. Ms.R.Beulah**,Assistant Professor, Department of Computer Science, Yadava College – Madurai.

YADAVA COLLEGE (AUTONOMOUS)

DEPARTMENT OF COMPUTER SCIENCE

Post Graduate Course

Choice Based Credits System Syllabus

(2022 - 2023)

PROGRAM OUTCOMES (PO)

- Develops an understanding of scientific theory principles and perspectives in sciences by critical thinking.
- Develops problem solving skills and is able to design and carry out innovative research projects.
- Communicates effectively, comprehends knowledge, writes effective reports, design documentation and makes effective presentations.
- Functions effectively as an individual, as a member and leader of diverse teams in multidisciplinary settings for holistic development.
- Applies ethical principles and is committed to professional ethics, responsibilities in the field of research, is able to design, analyze, interpret data and find solutions for complex problems by applying the right tools.
- Realizes and promotes environmental sustainability through various eco – friendly measures that encourage judicious use of resources.
- Post Graduate studies boosts the self directed career progress and outline the career paths. It improves the ability to tackle complex and challenging assessments tasks and helps in lifelong learning to be globally competent.
- Takes up responsibilities in production, quality testing, designing and marketing which contribute to the growth of industry and thus increases employability.

PROGRAM SPECIFIC OUTCOMES (PSO)

- Provides technology – oriented students with the knowledge and ability to develop creative solutions.
- Develop skills to learn new technology.
- Apply Computer Science Theory and software development concepts to construct computing – based solutions.
- Design and develop computer programs/ computer – based systems in the areas related to algorithms, networking, web design, cloud computing, Artificial Intelligence, Mobile Applications.
- Engage in Professional development in the field of Information Technology and Computer Science.
- Know about computing principles and business practices employed as software solutions in industries.
- Develop software applications/ solutions as per the needs of Industry and society.
- Adopt new and fast emerging technologies in computer science.

DEPARTMENT OF COMPUTER SCIENCE YADAVA COLLEGE

CHOICE BASED CREDITS SYSTEM SYLLABUS PLAN

POST GRADUATE PROGRAMME

(2022 – 2023)

SEMESTER I				
	Subject Code	**Title of the Paper**	**Hours / Week**	**Credits**
Core – I		Design and Analysis of Algorithm	5	5
Core – II		Advanced Database Management Systems	5	5
Core – III		Internet of Things	5	4
Core – IV		**Practical – I:** Algorithms – Lab	5	3
Core – V		**Practical – II:** Advanced DBMS – Lab	6	3
Elective – I		1. Optimization Techniques 2. Cloud Computing 3. Advanced Computer Networks	4	4
		TOTAL	**30**	**24**

SEMESTER II				
	Subject Code	**Title of the Paper**	**Hours /Week**	**Credits**
Core – VI		Advanced Java Programming	4	4
Core – VII		Distributed Operating System	5	5
Core – VIII		Machine Learning	5	5
Core – IX		**Practical – III:** Advanced Java – Lab	6	3
Core – X		**Practical – IV:** Machine Learning-Lab	6	3
Elective – II		1. Theory of Computation 2. Data Mining 3. Soft Computing	4	4
		TOTAL	**30**	**24**

SEMESTER III				
	Subject Code	**Title of the Paper**	**Hours / Week**	**Credits**
Core – XI		Compiler Design	5	5
Core – XII		Digital Image Processing	4	4
Core – XIII		Advanced Web Technology	5	5
Core – XIV		**Practical - V:** Advanced Web Technology - Lab	6	3
Core – XV		**Practical - VI:** Image Processing Lab	5	3
Elective – III		1.Dot Net Programming 2. Web Services 3. Mobile Computing	5	5
TOTAL			**30**	**25**

SEMESTER IV				
	Subject Code	**Title of the Paper**	**Hours / Week**	**Credits**
Core – XVI		Cryptography and Network Security	6	3
Core – XVII		Project Viva – Voce	20	10
Elective - IV		1.Data Science and Big Data Analytics 2. Embedded Systems 3. Software Project Management	4	4
TOTAL			**30**	**17**

YADAVA COLLEGE (AUTONOMOUS) MADURAI – 14

BLUE PRINT OF THE CHOICE BASED CREDITS SYSTEM DISTRIBUTION OF NUMBER OF PAPERS (**No**), HOURS (**Hr**), and CREDITS (**Cr**)

PG COURSE

M.Sc COMPUTER SCIENCE

Subject	**Semester I**			**Semester II**			**Semester III**			**Semester IV**			**Total**		
Core	**No**	**Hr**	**Cr**	**No**	**Hr**	**Cr**	**No**	**Hr**	**Cr**	**No**	**Hr**	**Cr**	**No**	**Hr**	**Cr**
Theory	5 **3(T)+2(P)**	26	20	5 **3(T)+2(P)**	26	20	5 **3(T)+2(P)**	25	20	2 **1(T)+1(P)**	10	5	17	87	65
Elective	1	4	4	1	4	4	1	5	5	1	4	4	4	17	17
Project	--	--	--	--	--	--	--	--	--	1	16	8	1	16	08
Total	**06**	**30**	**24**	**06**	**30**	**24**	**06**	**30**	**25**	**04**	**30**	**17**		**120**	**90**

Core – I

Course Title: **Design and Analysis of Algorithms**

Semester	**: I**	**Total Hours/ Semester**	**: 75**
Subject Code	**:**	**Hours of Teaching/Week**	**:5**
		Credits	**:5**

Objective

To learn and to develop skills to design and analyze simple linear and non – linear data structure and to apply appropriate problem solving it enables them to gain knowledge in practical applications of data structures.

UNIT I **(12 Hours)**

Introduction: Algorithm Definition – Algorithm Specification – Performance Analysis-Asymptotic Notations. Elementary Data Structures: Stacks and Queues – Trees – Dictionaries – Priority Queues – Sets and Disjoint Set Union – Graphs

Outcome

- Ability to Algorithm specification Stacks and Queues.

UNIT II **(16 Hours)**

Divide and Conquer: The General Method – Defective Chessboard – Binary Search – Finding the Maximum and Minimum – Merge Sort – Quick Sort – Selection - Strassen's Matrix Multiplication.

Outcome

- Understood the concepts of Divide and Conquer including Binary Search, Merge Sort, Quick Sort, Strassen's Matrix Multiplication.

UNIT III **(16 Hours)**

The Greedy Method: General Method - Container Loading - Knapsack Problem - Tree Vertex Splitting – Job Sequencing With Deadlines - Minimum Cost Spanning Trees - Optimal Storage On Tapes – Optimal Merge Patterns - Single Source Shortest Paths.

Outcome

- Ability to design program using a Greedy Method including Knapsack Problem, Tree vertex splitting, spanning Trees.

UNIT IV **(18 Hours)**

Dynamic Programming: The General Method – Multistage Graphs – All-Pairs Shortest Paths – Single-Source Shortest Paths - Optimal Binary Search Trees - String Editing - 0/1 Knapsack - Reliability Design - The Traveling Salesperson Problem - Flow Shop Scheduling. Basic Traversal and Search Techniques: Techniques for Binary Trees – Techniques for Graphs – Connected Components and Spanning Trees – Bi-connected Components and DFS.

Outcome

- Ability to Choose appropriate Data structures like Binary Search Tree, Graphs, DFS

UNIT V **(13 Hours)**

Backtracking: The General Method – The 8-Queens Problem – Sum of Subsets – Graph Coloring – Hamiltonian Cycles – Knapsack Problem Branch and Bound: Least Cost searchhod - 0/1 Knapsack Problem.

Outcome

- Understood the concept of Hamiltonian Cycles, 8 – Queens Problem

Pedagogy: Chalk & Talk, Assignments, Group Exercises, Seminar and PPT.

Teaching Method

Units	Hours	Mode Pedagogy
I	12	Chalk & Talk
II	16	Chalk & Talk, Assignment
III	16	Chalk & Talk, Group Exercise
IV	18	Seminar
V	13	PPT

Text Book

1. Ellis Horowitz, Satraj Sahni and Sanguthevar Rajasekaran, Fundamentals of Computer Algorithms, Universities Press, Second Edition, Reprint 2009.

Book for References

1. Data Structures Using C - Langsam, Augenstien, Tenenbaum, PHI
2. Data structures and Algorithms, V.Aho, Hopcropft, Ullman , LPE
3. Introduction to design and Analysis of Algorithms - S.E. Goodman, ST. Hedetniem- TMH.
4. Carlos A.Coello Coello, Gary B.Lamont, David A.Van Veldhuizen, "Evolutionary Algorithms for Solving Multi-Objective Problems", Springer 2nd Edition, 2007.

Web References

1. https://www.javatpoint.com/data-structure-tutorial
2. https://www.techtarget.com/searchdatamanagement/definition/data-structure

Name of the Course Designer

1. **Dr.G.Marimuthu**,Assistant Professor & Head, Department of Computer Science, Yadava College – Madurai
2. **Mr.R.Shanmugaraj**, Lecturer,Department of Computer Science, Yadava College - Madurai

Core – II

Course Title: Advanced Database Management Systems

Semester	**: I**	**Total Hours/ Semester**	**: 75**
Subject Code	**:**	**Hours of Teaching/Week**	**:5**
		Credits	**:5**

Objective

Provide the strong foundation in advanced Database concepts from an industry perspective. Covers advanced data modeling concepts and learn query processing, procedures, functions, cursors and packages.

UNIT I **(14 Hours)**

Data, Information and Information Processing: Introduction – Definition of Information – History of Information – Quality of Information – Accuracy – Timeliness – Relevancy. **Introduction to Database Management System:** Introduction – Why A Database – Characteristics Of Data In A Database – Database Management System – Transaction Management – Concurrency Control – Security Management – Language Interface – Storage Management – Data Catalog Management – Why DBMS – Types Of Database Management Systems – Hierarchical Model – Advantages – Disadvantages – Network Model - Advantages – Disadvantages – Relational - Advantages – Disadvantages – Object –Oriented Model - Advantages – Disadvantages – Object-Relational Model – Deductive / Inference Model – Comparison between the Various Database Models.

Outcome

- Learnt the details of various Database models

UNIT II **(15 Hours)**

Introduction to Oracle and RDBMS: Understanding RDBMS – Understanding E-R Model - Identifying Keys – E-R Diagrams – Normalization – CODD'S Rules for Relational Databases. **Introduction to SQL:** Overview Of SQL – Sub-Language of SQL – Data types in Oracle – Operators in Oracle – Retrieving Data form Database Tables – Using the SELECT Statement – Using the WHERE Clause – Using the ORDER BY Clause – Using the GROUP BY And HAVING Clauses – Using the ROLLUP and CUBE Operations – Using Joins and SET Operators in Oracle – Equi And Non-Equi Joins – Cartesian join – outer join – self join - cross join – natural join – Set Operators – **Functions in Oracle** – Arithmetic Functions – Date Functions – Character Functions.

Outcome

- Understood the basic of E-R Diagram and Normalization concepts

UNIT III **(15 Hours)**

DDL and DML Statements : Understanding DDL – Creating Tables – Deriving a Table from Existing Table – Altering Tables – Dropping Tables – Understanding Integrity Constrains – NULL Constraint – UNIQUE KEY Constraint – PRIMARY KEY Constraint – FORGIEN KEY Constraint.

Understanding DML: Using INSERT statement – Using UPDATE statement – Using DELETE statement. **Views in ORACLE:** Inserting, Updating and Deleting Data Using Views – Types of Views – Read-Only Views – Inline Views – Materialized Views – object views.

Outcome

- Use SQL Query to create, alter, drop table

UNIT IV **(15 Hours)**

Understanding DCL and TCL Statements: Understanding Data Control Statements – Using the GRANT Statement - Using the WITH GRANT OPTION – Using the REVOKE Statement – Understanding Locking and Transaction Control Language – Introducing Locking – Introducing Transactions – Using COMMIT And ROLLBACK Statement. **PL/SQL Programming:** Introduction to PL/SQL – PL/SQL types.

Cursors in ORACLE: Working with Cursors – Declaring Cursors – Opening Cursors and Retrieving Records – Closing Cursors – Using %ROWTYPE Attributes – Attributes Of Explicit Cursors – Attributes Of Implicit Cursors.

Procedures, Functions and Packages: Working with Procedures – The CREATE PROCEDURE Statement –Working with Functions – The CREATE FUNCTION Statement – Working with Packages – Creating Packages - Calling Stored Procedures and Functions.

Outcome

- Understood the basic Data types in PL/SQL

UNIT V **(16 Hours)**

TRIGGERS IN ORACLE: Working with Trigger – The CREATE TRIGGER Statement – Types of Triggers – Creating Triggers – Creating BEFORE and AFTER Triggers.

MY – SQL: Fundamentals of MySQL and SQL : About MySQL : Installing and Using MySQL Workbench- Understanding SQL - Using MySQL - Exploring the MySQL Language : Reviewing MySQL word Usage - Using MySQL Operators ö Exploring MySQL Functions - Implementing MySQL Command Statements : MySQL Commands : Understanding the MySQL Workbench - Create Databases and Table : Creating and Using a Database - Creating a Table and Its Columns - Reviewing MySQL Data Types - Insert Data into Tables : Inserting Data.

Outcome

- Recognize the concept of MySQL and Triggers.

Pedagogy: Chalk & Talk, Assignments, Group Exercises, Seminar and PPT.

Teaching Method

Units	Hours	Mode Pedagogy
I	14	Chalk & Talk
II	15	Chalk & Talk, Group Exercise
III	15	Chalk & Talk, Assignment
IV	15	PPT
V	16	Seminar

Text Book

1. Abraham Silberschatz, Henry F Korth , S Sudarshan, "Database System Comcepts", 6th edition , McGraw-Hill International Edition , 2011

2. C.J.Date, A.Kannan, S.Swamynathan, "An Introduction to Database Systems", 8th Edition, Pearson Education Reprint 2016.

3.

Reference Books

1. Ramez Elmasri, Shamkant B Navathe, "Fundamental of Database Systems", Pearson, 7th edition 2016.

2. Thomas Connolly, Carolyn Begg., "Database Systems a practical approach to Design , Inmplementation and Management ", Pearson Education, 2014.

Web References

1. https://www.tutorialandexample.com/what-is-advanced-database-management-system

2. https://www.javatpoint.com/what-is-rdbms

Name of the Course Designer

1.**Mr. S.Saravanapandian**, Lecturer, Department of Computer Science, Yadava College – Madurai

2. **Ms. R. Beulah**, Assistant Profesor, Department of Computer Science, Yadava College – Madurai

Core – III

Course Title: Internet of Things

Semester : I | **Total Hours/ Semester : 75**
Subject Code : | **Hours of Teaching/Week:5**
Credits :4

Objective

- In order to gain knowledge of Internet of Things (IoT), IoT Architecture, and the Protocols related to IoT; and understand the concept of the Web of Thing and the relationship between the IoT and WoT.

UNIT I **(16 Hours)**

Introduction To IoT: Internet of Things - Physical Design- Logical Design- IoT Enabling Technologies - IoT Levels and Deployment Templates - Domain Specific IoTs - IoT and M2M - IoT System Management with NETCONF-YANG- IoT Platforms Design Methodology.

Outcome

- Understood the concept of IoT

UNIT II **(14 Hours)**

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

Outcome

- Understood the concept of IoT Architecture.

UNIT III **(14 Hours)**

IoT PROTOCOLS: Protocol Standardization for IoT – Efforts – M2M and WSN Protocols – SCADA and RFID Protocols – Unified Data Standards – Protocols – IEEE 802.15.4 – BACNet Protocol – Modbus– Zigbee Architecture – Network layer – 6LowPAN - CoAP – Security

Outcome

- Improve the details of an IoT Protocols.

UNIT IV **(15 Hours)**

WEB OF THINGS: Web of Things versus Internet of Things – Two Pillars of the Web – Architecture Standardization for WoT– Platform Middleware for WoT – Unified Multitier WoT Architecture – WoT Portals and Business Intelligence. Cloud of Things: Grid/SOA and Cloud Computing – Cloud Middleware – Cloud Standards – Cloud Providers and Systems – Mobile Cloud Computing – The Cloud of Things Architecture.

Outcome

- Understanding the skills of Web of Things and Cloud of Things.

UNIT V **(16 Hours)**

APPLICATIONS: The Role of the Internet of Things for Increased Autonomy and Agility in Collaborative Production Environments - Resource Management in the Internet of Things: Clustering, Synchronisation and Software Agents. Applications - Smart Grid – Electrical Vehicle Charging.

Outcome

- Identify the importance of the applications.

Pedagogy: Chalk & Talk, Assignments, Group Exercises, Seminar and PPT.

Teaching Method

Units	Hours	Mode Pedagogy
I	16	Chalk & Talk
II	14	Chalk & Talk, Group Discussion
III	14	Chalk & Talk, Assignment
IV	15	Seminar
V	16	PPT

Text Books

1. Arshdeep Bahga, Vijay Madisetti, "Internet of Things – A hands-on approach", Universities Press, 2015.

Reference Book

1. Dieter Uckelmann, Mark Harrison, Michahelles, Florian (Eds), "Architecting the Internet of Things", Springer, 2011.
2. Jan Ho¨ ller, Vlasios Tsiatsis , Catherine Mulligan, Stamatis , Karnouskos, Stefan Avesand. David Boyle, "From Machine-to-Machine to the Internet of Things - Introduction to a New Age of Intelligence", Elsevier, 2014.
3. Networks, Crowds, and Markets: Reasoning About a Highly Connected World - David Easley and Jon Kleinberg, Cambridge University Press - 2010.
4. Olivier Hersent, David Boswarthick, Omar Elloumi , "The Internet of Things – Key applications and Protocols", Wiley, 2012.

Web References

https://www.oracle.com/in/internet-of-things/what-is-iot/

Name of the Course Designer

1.**Dr.G.Marimuthu**, Assistant Professor & Head, Department of Computer Science, Yadava College – Madurai

2..**Mr. M.kaleeswaran**, Lecturer, Department of Computer Science, Yadava College – Madurai

Core IV – Practical: I

Course Title: Algorithms Lab

Semester : I	**Total Hours/ Semester : 75**
Subject Code :	**Hours of Teaching/Week:5**
	Credits :3

Objective

This course will enable the student to understand and gain the knowledge of the concept of Stack and Queue operations, searching Techniques, Sorting techniques, Linked List, Polynomial, Tree Traversals.

Algorithm Techniques

1. Program To Illustrate The Linear Search
2. Program To Illustrate Binary Search
3. Program For Implementing Bubble Sort
4. Program For Implementing Insertion Sort
5. Program For Implementing Selection Sort
6. Program For Implementing Quick Sort
7. Program For Implementing Merge Sort
8. Program For Implementing Stack Using Arrays
9. Program For Implementing Queue Using Arrays
10. Program For Implementing Tree Traversal
11. Program To Convert Infix Expression To Postfix Expression By Using Stack Implementation
12. Program To Convert Infix Expression Infix To Prefix Form

Pedagogy : Systems, Internet, Group Exercises and PPT.

Name of the Course Designer

1. **Mrs. S.Anu**, Lecturer, Department of Computer Science, Yadava College – Madurai
2. **Mrs.A.Priyanka**, Lecturer, Department of Computer Science, Yadava College – Madurai

Core – V – Practical: II

Course Title: Advanced DBMS Lab

Semester : I	**Total Hours/ Semester : 90**
Subject Code :	**Hours of Teaching/Week:6**
	Credits :3

Objective

- Acquire Knowledge of Database Models, Applications of Database Models and Emerging Trends

Queries and SQL Functions

1. Creating Tables for Different Applications using DDL
2. Performing all DML Functions
3. Performing DCL Functions
4. Solving Queries - Date Functions, Numeric Functions, Group Functions
5. Set Operators- Union, Union All, Intersect, Minus
6. Join Concept- Simple Join, Table Aliases, Self Join, Outer Join, Sub Queries, Multiple Sub queries

Constraints, Database Objects & PL/SQL

1. Creating tables with integrity constraints- domain integrity, check constraints, Entity integrity constraints-Referential integrity constraints, deferrable constraints
2. Creating tables with security- row level locks, table level locks
3. Creating database objects using queries- synonym, sequences, view, partition view, index

1. Creating PL/SQL block using all the control statements
2. Creating PL/SQL block using EXPLICIT & IMPLICIT CURSOR
3. Creating PL/SQL block with error handling techniques (pre-defined & user-defined Exception)

Subprograms, packages, Triggers

a. Creating procedures, functions, and packages for different applications.
b. Creating triggers for different applications

Pedagogy : Systems, Internet, Group Exercises and PPT.

Name of the Course Designer

1.**Mr. S.Saravanapandian**, Lecturer, Department of Computer Science, Yadava College – Madurai

2. **Mrs.J.Prathiba**, Lecturer, Department of Computer Science, Yadava College – Madurai

Elective – I

Course Title: Optimization Techniques

Semester : I	**Total Hours/ Semester : 60**
Subject Code :	**Hours of Teaching/Week:4**
	Credits :4

Objective

Optimization Techniques based upon the fundamental of Mathematics problem formulation by using a linear programming and to gain the knowledge of PERT and CPM

UNIT – I **(12 Hours)**

Linear Programming Problem (LPP): Formulations and graphical solution of (2 variables) canonical and standard terms of linear programming problem. Simplex method, Two phase simplex method

Outcome

- Carry out the fundamental knowledge of LPP

UNIT – II **(14 Hours)**

Duality in LPP- dual problem to primal- primal to dual problem-duality simplex method-Revised simplex method-revised simplex algorithm-revised simplex method versus simplex method

Outcome

- Analyze the concept of simplex method and revised simple method.

UNIT – III **(14 Hours)**

Transportation Model: North West corner Method, Least cost method, and vogel's approximation method. Determining Net evaluation-Degeneracy in TP- Assignment Model : Hungarian assignment model – Travelling sales man problem.

Outcome

- Identify appropriate transportation model.

UNIT – IV **(10 Hours)**

Replacement Problem: Replacement policy for equipment that deteriorate gradually, Replacement of item that fail suddenly-Individual and group replacement, Problems in mortality and staffing.

Outcome

- Identify appropriate equipment replacement techniques.

UNIT – V **(10 Hours)**

Project Scheduling PERT/CPMNetworks – Fulkerson's Rule – Measure Of Activity – PERT Computation – CPMComputation – Resource Scheduling.

Outcome

- Carry out the concepts of PERT and CPM

Pedagogy: Chalk & Talk, Assignments, Group Exercises.

Teaching Method

Units	Hours	Mode Pedagogy
I	12	Chalk & Talk
II	14	Chalk & Talk
III	14	Chalk & Talk, Assignment
IV	10	Chalk & Talk, Group Exercise
V	10	Seminar

Textbooks

1. KantiSwarup, P.K. Gupta &Manmohan – Operation Research 1996.
2. S.Kalavathy: Operations Research – Second Edition – Vikas Publishing House Pvt.Ltd.,
3. S.Godfrey Winster, S. Aruna Devi, R.Sujatha, "Compiler Design", Yesdee Publishing.

References

1. D.Shanthi, N.Uma Maheswari, S.Jeyanthi, "Theory of Computation", Yesdee Publishing.
2. John W.Chinneck, "Feasibility and Infeasibility in Optimization-Algorithms and Computatonal Methods ", Springer, 2015.

Web References

1. https://www.britannica.com/science/optimization

Name of the Course Designer

Mr. T.Vasantha Kumar, Lecturer, Department of Mathematics, Yadava College – Madurai

Elective – I
Course Title: CLOUD COMPUTING

Semester : I	**Total Hours/ Semester : 60**
Subject Code :	**Hours of Teaching/Week:4**
	Credits :4

Objective

The objective of this course is to provide students with the comprehensive and in-depth knowledge of Cloud Computing concepts, technologies, to frontier areas of Cloud Computing and information systems, while providing sufficient foundations to enable further study and research.

UNIT - I (12 Hours)

COMPUTING BASICS

Cloud computing definition- Characteristics- Benefit-Challenges- Distributed Systems- Virtualization-Service-oriented computing- Utility-oriented computing- Building Cloud Computing environments- computing platforms & technologies - Cloud Models – Cloud Service Examples - Cloud Based Services & Applications - Cloud concepts and Technologies.

Outcome

- Understanding the Challenges and computing Environments

UNIT - II (13 Hours)

VIRTUALIZATION, CLOUD SERVICES AND PLATFORMS

Virtualization: Virtualization- Characteristics- taxonomy-types- Pros and Cons- Examples Architecture: Reference model- types of clouds- Compute Service - Storage Services - Cloud Database Services - Application Services - Content Delivery Services - Analytics Services - Deployment And Management Service - Identity And Access Management Services - Open Source Private Cloud Software.

Outcome

- Ability to apply virtualization, cloud services

UNIT – III (12 Hours)

CLOUD APPLICATION DESIGN AND DEVELOPMENT

Design consideration- Reference Architecture for Cloud Application - Cloud Application Design Methodologies - Data Storage Approaches- Development in Python: Design Approaches – Application: Image Processing - Document Storage - Map Reduce - Social Media Analytics.

Outcome

- Ability to apply Map Reduce, Application design Methodologies

UNIT – IV (13 Hours)

PYTHON FOR CLOUD

Introduction- Installing Python- Data types & Data Structures- Control Flow- Functions- Modules- Packages- File Handling-Date/Time Operations – Classes- Python for Cloud: Amazon Web Services –Google Cloud Platform - Windows Azure –Map Reduced –Packages of Interest – Designing a RESTful Web API.

Outcome

- Understood the concepts of Python for Cloud, Functions and Modules

UNIT – V **(10 Hours)**

BIG DATA ANALYTICS, MULTIMEDIA CLOUD & CLOUD SECURITY

Big Data Analytics: Clustering Big data - Classification of Big Data – Recommendation systems. Multimedia Cloud: Case Study: Live Video Stream App - Streaming Protocols – Case Study: Video Transcoding App-Cloud Security: CSA Cloud Security Architecture - Authentication - Authorization - Identity and Access management - Data Security - Key Management- Auditing- Cloud for Industry, Healthcare & Education.

Outcome

- Understood the concepts of Big Data Analytics and Multimedia

Pedagogy: Chalk & Talk, Assignments, Group Exercises.

Teaching Method

Units	Hours	Mode Pedagogy
I	12	Chalk & Talk
II	13	Chalk & Talk
III	12	Chalk & Talk, Assignment
IV	13	Chalk & Talk, Group Exercise
V	10	Seminar

Text Books

1. Buyya, Vecciola and Selvi, Mastering Cloud Computing: Foundations and Applications Programming, Tata McGraw Hill, 2013.
2. ArshdeepBahga, Vijay Madisetti, "Cloud Computing: A Hands – On Approach" Universities press (India) Pvt. limited 2016.

References:

1. Rittinghouse and Ransome, Cloud Computing: Implementation,Management, and Security, CRC Press, 2016.
2. Michael Miller "Cloud Computing Web based application that change the way you work and collaborate online". Pearson edition, 2008.

Web Reference

https://www.google.com/amp/s/www.techtarget.com/searchcloudcomputing/definition/cloud-computing%3famp=1

Name of the Course Designer

1.**Mr.S.Saravanapandian**, Lecturer, Department of Computer Science, Yadava College – Madurai

2.**Mrs. J.Prathiba**, Lecturer, Department of Computer Science, Yadava College – Madurai

Elective – I
Course Title: ADVANCED COMPUTER NETWORKS

Semester : I	**Total Hours/ Semester : 60**
Subject Code :	**Hours of Teaching/Week:4**
	Credits :4

Objectives

To study communication network protocols, different communication layer structure, mechanism for data communication, concepts of the OSI reference model and the TCP- IP reference model.

Unit I **(12Hours)**

Introduction – Network Hardware – Software – Reference Models – OSI and TCP/IP models – Example networks: Internet, 3G Mobile phone networks, Wireless LANs –RFID and sensor networks - Physical layer– Theoretical basis for data communication - guided transmission media

Outcome

- Understood the basic Hardware, TCP/IP Models.

Unit II **(14Hours)**

Wireless transmission - Communication Satellites – Digital modulation and multiplexing- Telephones network structure – local loop, trunks and multiplexing, switching. Data link layer: Design issues – error detection and correction.

Outcome

- Understood the Data link Layer, Error correction and deduction.

Unit III **(11Hours)**

Elementary data link protocols - sliding window protocols – Example Data Link protocols – Packet over SONET, ADSL - Medium Access Layer – Channel Allocation Problem – Multiple Access Protocols.

Outcome

- Understanding the concepts of Medium Access Layer, Multiple Access Problem

Unit IV **(11Hours)**

Network layer - design issues - Routing algorithms - Congestion control algorithms – Quality of Service – Network layer of Internet - IP protocol – IP Address – Internet Control Protocol.

Outcome

- Ability to understand the concepts of Routing Algorithms, Quality of Service

Unit V **(12Hours)**

Transport layer – transport service- Elements of transport protocol - Addressing, Establishing & Releasing a connection – Error control, flow control, multiplexing and crash recovery - Internet Transport Protocol – TCP - Network Security: Cryptography.

Outcome

- Ability to understand the Transport Layer and Cryptography

Pedagogy: Chalk & Talk, Assignments, Group Exercises.

Teaching Method

Units	Hours	Mode Pedagogy
I	12	Chalk & Talk
II	14	Chalk & Talk
III	11	Chalk & Talk, Assignment
IV	11	Chalk & Talk, Group Exercise
V	12	Seminar

Text Book

1. S. Tanenbaum, 2011, Computer Networks, Fifth Edition, Pearson Education, Inc.

Reference Books

1. B. Forouzan, 1998, Introduction to Data Communications in Networking, Tata McGraw Hill, New Delhi.
2. F. Halsall, 1995, Data Communications, Computer Networks and

Website, E-learning resources

http://peasonhighered.com/tanenbaum

Name of the Course Designer

1. **Dr.G.Marimuthu**, Assistant Professor & Head, Department of Computer Science, Yadava College – Madurai

2.**Mr. M.Kaleeswaran**, Lecturer, Department of Computer Science, Yadava College – Madurai

Core – VI

Course Title: Advanced Java Programming

Semester : II | **Total Hours/ Semester : 60**
Subject Code : | **Hours of Teaching/Week:4**
Credits :4

Objective

- To enable the students to use advanced technology in Java such as Applets and JSP and Web Application using Java Servlet, to develop Graphics, Animations and multi threading for designing and game based applications.

UNIT I **(12 Hours)**

Overview of Java Language: Simple Java Program – Java Program Structure – Java Tokens – Java Statements – Implementing a Java Program – Java Virtual Machine – Command Line Arguments. **Constants, Variables and Data Types:** Constants – Variables – Data Types – Declaration of Variables – Giving Values to Variables – Symbolic Constants – Type Casting.

Operators and Expressions: Arithmetic Operators – Relational Operators – Logical Operators – Assignment Operators - Increment and Decrement Operators – Conditional Operator - Bit-wise Operators - Special Operators – Arithmetic Expressions - Evaluation of Expressions – Precedence of Arithmetic Operators – Type Conversions in Expressions – Operator Precedence and Associativity – Mathematical functions. **Decision Making and Branching:** Decision Making with If Statement – Simple If Statement – The If..Else Statement – Nesting of If…Else Statements – The Else If Ladder – The Switch Statement - ?: Operator. **Decision Making and Looping:** While Statement – do Statement – for Statement – Jumps in Loops – Labeled loops

Outcome

- Understand Java Language, Constants and Operators, Decision Making, Branching and looping.

UNIT II **(12 Hours)**

Classes, Objects and Methods: Defining a Class – Fields Declaration – Methods Declaration – Creating Objects – Accessing Class Members – Constructors - Method Overloading – Static Members – Nesting of Methods – Inheritance: Extending a Class – Overriding Method – Find Variables and Methods – Final Classes – Abstract Methods and Classes – Visibility control. **Arrays, Strings and Vectors:** One-dimensional Arrays – Creating an Array – Two-dimensional Array - Strings – Vectors – Wrapper classes. **Interfaces Multiple Inheritance:** Defining Interfaces – Extending Interfaces – Implementing Interfaces – Accessing Interface Variables.

Outcome

- Implementing the use of a variety of basic control structures including classes, objects, methods, Arrays, Interfaces and Multiple Inheritance.

UNIT III **(12 Hours)**

Packages: Putting Classes Together: Using System Packages – Creating Packages – Accessing a Package – Using a Package – Adding a Class to a Package – Binding classes.

Multithreaded Programming: Creating Threads – Extending the Thread Class – Stopping and Blocking a Thread – Life Cycle of a Thread – Using Thread Methods – Thread Exceptions – Thread Priority – Synchronization – Implementing the 'Runnable' Interface.

Managing Errors and Exceptions: Types of Errors – Exceptions – Syntax of Exception Handling Code – Multiple Catch Statements – Using Finally Statement – Throwing Our Own Exceptions

Outcome

- Understanding the skills of Packages, Multi Threat and Managing Errors and Exceptions.

UNIT IV **(12 Hours)**

Applets Programming: Preparing to Write Applets – Building Applet Code – Applet Life Cycle - Applet Tag - Adding Applet to HTML File - Running the Applet - Getting Input from the User – Event Handling. **Graphics Programming:** The Graphics Class - Lines and Rectangles - Circles and Ellipses - Drawing Arcs – Drawing Polygons - Line graphs - Drawing Bar Charts.

Outcome

- Ability to understand the Applet and Graphics Programming Concepts.

UNIT V **(12 Hours)**

JAVA SERVER PAGES (JSP): Introduction – Advantages of JSP – Developing first JSP – Reading Request Information – Retrieving the Data Posted from a HTML File to a JSP File – components of JSP – JSP Sessions – Cookies – Disabling a Sessions. **SERVLET :** Introduction-Advantages of Servlet over CGI-Installing Servlet-the Servlet life cycle-Servlet API-A simple Servlet- handling HTTP get request HTTP post request-cookies-session tracking-multi tier application using database connectivity-Servlet chaining.

Outcome

- Build Web Applications using Java Servlet API, Java Server Pages and HTTP.

Pedagogy: Chalk & Talk, Assignments, Group Exercises, Seminars and PPT.

Teaching Method

Units	Hours	Mode Pedagogy
I	12	Chalk & Talk
II	12	Chalk & Talk, Assignment
III	12	Chalk & Talk, Group Discussion
IV	12	Seminar
V	12	PPT

Text Book(s)

1. **"Programming with JAVA A Primer "** E.Balagurusamy 5th Edition - *TMH Publishing Company Ltd*
2. ''Web Technology'' A Developer's perspective, **N.P.Gopalan., J.Akilandeswari, PHI.**

UNIT I	Chapter 3	3.2, 3.5, 3.6, 3.7, 3.9, 3.10, 3.11
	Chapter 4	4.2, 4.3, 4.4, 4.5, 4.6, 4.8, 4.9
	Chapter 5	5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8, 5.9, 5.10, 5.11, 5.12, 5.13, 5.14, 5.15
	Chapter 6	6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8
	Chapter 7	7.2, 7.3, 7.4, 7.5, 7.6
UNIT II	Chapter 8	8.2, 8.3, 8.4, 8.5, 8.6, 8.7, 8.8, 8.9, 8.10, 8.11, 8.12 8.13, 8.14, 8.16, 8.18
	Chapter 9	9.2, 9.3, 9.4, 9.5, 9.6, 9.7
	Chapter 10	10.2, 10.3, 10.4, 10.5
UNIT III	Chapter 11	11.3, 11.5, 11.6, 11.7, 11.8
	Chapter 12	12.2 TO 12.10
	Chapter 13	13.2 TO 13.7
UNIT IV	Chapter 14	14.3, 14.4, 14.5, 14.8, 14.9, 14.10, 14.16, 14.17
	Chapter 15	15.2 TO 15.7, 15.9
UNIT V	Chapter 10 , Chapter 11	

Reference Book

1. D.Shanthi, N.Uma Maheswari, S.Jeyanthi, "Theory of Computation", Yesdee Publishing.
2. John W.Chinneck, "Feasibility and Infeasibility in Optimization-Algorithms and Computatonal Methods ", Springer, 2015.

Web References

1. https://www.java.com/en/

Name of the Course Designer

1. **Dr.G.Marimuthu**, Assistant Professor & Head, Department of Computer Science, Yadava College – Madurai

2.**Mr. M.Kaleeswaran**, Lecturer, Department of Computer Science, Yadava College – Madurai

Core – VII

Course Title: Distributed Operating System

Semester : II	**Total Hours/ Semester : 75**
Subject Code :	**Hours of Teaching/Week:5**
	Credits :5

Objectives

- To study distributed operating system concepts, To understand hardware, software and communication in distributed OS

UNIT I **(15 Hours)**

Introduction – Operating System Definition – Functions of Operating System – Types of Advanced Operating System – Design Approaches – Synchronization Mechanisms – concepts of a Process – Critical Section Problem – Process Deadlock – Models of Deadlock – Conditions for Deadlock – System with single-unit requests, Consumable Resources , Reusable Resources.

Outcome

- Understood the basic concepts of an Operating System.

UNIT II **(17 Hours)**

Distributed Operating Systems: Introduction- Issues – Communication Primitives – Inherent Limitations –Lamport's Logical Clock , Vector Clock, Global State , Cuts – Termination Detection – Distributed Mutual Exclusion – Non Token Based Algorithms – Lamport's Algorithm - Token Based Algorithms –Distributed Deadlock Detection – Distributed Deadlock Detection Algorithms – Agreement Protocols

Outcome

- Improve the knowledge of Distributed Operating System, Lamport's Algorithm.

UNIT III **(14 Hours)**

Distributed Resource Management – Distributed File Systems – Architecture – Mechanisms – Design Issues – Distributed shared Memory – Architecture – Algorithm – Protocols – Design Issues – Distributed Scheduling – Issues – Components – Algorithms.

Outcome

- Ability to apply the knowledge of distributed file system and algorithm.

UNIT IV **(13 Hours)**

Failure Recovery and Fault Tolerance – Concepts – Failure Classifications – Approaches to Recovery – Recovery in Concurrent Systems – Synchronous and Asynchronous Check pointing and Recovery –Check pointing in Distributed Database Systems – Fault Tolerance Issues – Two-Phase and Nonblocking Commit Protocols – Voting Protocols – Dynamic Voting Protocols.

Outcome

- Implement the Fault Tolerance and protocols.

UNIT V **(16 Hours)**

Multiprocessor and Database Operating Systems –Structures – Design Issues – Threads – Process Synchronization – Processor Scheduling – Memory management – Reliability/Fault Tolerance – Database Operating Systems – concepts – Features of Android OS, Ubuntu, Google Chrome OS and Linux operating systems.

Outcome

- Identify and apply the skills of Multi Processor and Database OS.

Pedagogy: Chalk & Talk, Assignments, Group Exercises, Seminars and PPT.

Teaching Method

Units	Hours	Mode Pedagogy
I	15	Chalk & Talk
II	17	Chalk & Talk, Group Exercise
III	14	Chalk & Talk, Assignment
IV	13	PPT
V	16	Seminar

Text Books

1. MukeshSinghalN.G.Shivaratri, "Advanced Concepts in Operating Systems", McGraw Hill 2000.
2. Distributed Operating System – Andrew S. Tanenbaum, PHI.

Reference Books

1. Abraham Silberschatz, Peter B.Galvin, G.Gagne, "Operating Concepts", 6th Edition Addison Wesley publications 2003.

2. Andrew S.Tanenbaum, "Modern Operating Systems", 2nd Edition Addison Wesley 2001

Web References

1. https://www.java.com/en/

Name of the Course Designer

1.**Mr.S.Saravanapandian**, Lecturer, Department of Computer Science, Yadava College – Madurai

2.**Mrs. J.Prathiba**, Lecturer, Department of Computer Science, Yadava College – Madurai

Core – VIII

Course Title: Machine Learning

Semester : II	**Total Hours/ Semester : 75**
Subject Code :	**Hours of Teaching/Week:5**
	Credits :5

Objectives

- ❖ To Learn about Machine Intelligence and Machine Learning applications, and to apply machine learning algorithms to real-world applications.

UNIT I **(14 Hours)**

Introduction: Learning Problems – Perspectives and Issues – Concept Learning – Version Spaces and Candidate Eliminations – Inductive bias – Decision Tree learning – Representation – Algorithm – Heuristic Space Search.

Outcome

- Understood the basic concepts of Machine learning, Decision Trees Learning and Algorithms.

UNIT II **(16 Hours)**

Neural Networks and Genetic Algorithms : Neural Network Representation – Problems – Perceptrons – Multilayer Networks and Back Propagation Algorithms – Advanced Topics – Genetic Algorithms – Hypothesis Space Search – Genetic Programming – Models of Evaluation and Learning.

Outcome

- Implement the knowledge of neural network and Genetic Algorithm.

UNIT III **(15 Hours)**

Bayesian and Computational Learning : Bayes Theorem – Concept Learning – Maximum Likelihood – Minimum Description Length Principle – Bayes Optimal Classifier – Gibbs Algorithm – Naïve Bayes Classifier – Bayesian Belief Network – EM Algorithm – Probability Learning – Sample Complexity – Finite and Infinite Hypothesis Spaces – Mistake Bound Model.

Outcome

- Ability to apply the knowledge of Bayes Theorem, EM Algorithm and Computational Learning

UNIT IV **(14 Hours)**

Instant Based Learning : K- Nearest Neighbour Learning – Locally weighted Regression – Radial Basis Functions – Case Based Learning.

Outcome

- Gathered the concept of Case based Learning

UNIT V **(16 Hours)**

Advanced Learning : Learning Sets of Rules – Sequential Covering Algorithm – Learning Rule Set – First Order Rules – Sets of First Order Rules – Induction on Inverted Deduction – Inverting Resolution – Analytical Learning – Perfect Domain Theories – Explanation Base Learning – FOCL Algorithm – Reinforcement Learning – Task – Q-Learning – Temporal Difference Learning.

Outcome

- Improve the knowledge of Advanced Learning.

Pedagogy: Chalk & Talk, Assignments, Group Exercises and PPT.

Teaching Method

Units	Hours	Mode Pedagogy
I	14	Chalk & Talk
II	16	Chalk & Talk, Group Discussion
III	15	Chalk & Talk, Assignment
IV	14	Seminar
V	16	PPT

TEXT BOOK

1. Tom M. Mitchell, ―Machine Learning, McGraw-Hill Education (India) Private Limited, 2013.

REFERENCES

1. EthemAlpaydin, ―Introduction to Machine Learning (Adaptive Computation and Machine Learning), The MIT Press 2004.
2. Stephen Marsland, ―Machine Learning: An Algorithmic Perspective, CRC Press, 2009.
3. Michael Affenzeller, Stephan Winkler, Stefan Wagner, Andreas Beham, "Genetic Algorithms and Genetic Programming", CRC Press Taylor and Francis Group.

WEB REFERENCES

1. https://www.geeksforgeeks.org/machine-learning/

Name of the Course Designer

1. **Ms. R. Beulah**, Assistant Profesor, Department of Computer Science, Yadava College – Madurai
2. **Mrs.S.Anu**, Lecturer, Department of Computer Science, Yadava College – Madurai

Core – IX Practical: III

Course Title: Advanced Java Lab

Semester : II	**Total Hours/ Semester : 90**
Subject Code :	**Hours of Teaching/Week:6**
	Credits :3

Objectives

- To enable the students to learn the ethical, historical, environmental and technological aspects of Advanced Java Programming and how it impacts the social and economic development of society

1. CLASSES AND OBJECTS

A company wants to store all the in formations about the employee working. The details Consists of Employee Number, Name, Department, Salary, Age & Sex. Create a class named Emp with above details and create objects to access them.

2. INHERITANCE

Design a mark list which has a following details, Student Name, Major, Year of student, Marks, Total and Results using two classes.

3. MULTITHREADING

An interviews going on for the post of the system analysis's in a software company. The candidates are waiting in a queue, from the queue they turn to company and to be interview. Each candidate is questioned for 10 minutes. Between each candidates interview the interviewer takes two minutes break. Create a thread to calculate the waiting time of each candidate (There is 50 to 20 candidates)

4. PACKAGES AND INTERFACES

Create a package called PGM with the following details PGM name, Broadcast day, Station name, director name, PGM type, broadcasting time(in railway time).Create another package called charge details with the following details PGM type is "commercial" Rs.20 per minutes. If PGM type is "Drama Rs.100 per minutes "Education" Rs.50 per minute. Inherit the necessary details from "PGM ".Using an interface calculate amount to be paid by the programmers to the radio station,. if they want their programs to broadcast. Display full information about the given details by creating objects.

5. METHOD OVERLOADING

Write a program to calculate sum of two numbers. Use same method name to calculate. Create objects to call the methods, differentiated either by signature or by data type or both

6. STRING HANDLING

Write a program to perform at least 10 methods to handle the strings.

7. EXCEPTION HANDLING

Create a try block that is likely to generate any five exceptions and then incorporate necessary catch blocks to catch and handle them appropriately.

8. APPLET

Write a Java applet to create a layout.

9. FRAMES

Write a Java program which will make the balls of various colors to move within the frame windows.

10. JDBC CONCEPTS

Write a Java programs to calculate the employee details using JDBC concepts.

11. JSP AND SERVLETS

1. Create a GenericServlet class and Print "Hello" to the browser using service() method?
2. Create a HttpServlet Class and Print "Hi World" to the browser using doGet() Method?
3. Create a HttpServlet class and Print "Hello World" to the browser using doPost() Method?
4. Create a HttpServlet class and Create a session inside the doGet()Method?
5. Create a GenericServlet class and Create a Session inside the service() method?

Pedagogy : Systems, Internet, Group Exercises and PPT.

Name of the Course Designer

1. **Mr.R.Shanmugaraj**, Lecturer, Department of Computer Science, Yadava College – Madurai
2. **Mrs. A.Priyanka**, Lecturer, Department of Computer Science, Yadava College – Madurai

Core – IX Practical: IV

Course Title: Machine Learning Lab

Semester : II	**Total Hours/ Semester : 90**
Subject Code :	**Hours of Teaching/Week:6**
	Credits :3

Objectives

The objective of this lab is to get an overview of the various machine learning techniques and can able to demonstrate using python.

1. Extract the Data from Database using Python.
2. Implement K – Nearest neighbours classification using Python.
3. Implement Linear Regression using Python.
4. Implementation of Logistic Regression using sklearn.
5. Implementation of K-Means Clustering.
6. Implement Naïve Bay'es Theorem to classify the English Text.
7. Implement an Algorithm to demonstrate the significance of Genetic Algorithm.
8. Build an Artificial Neural Network by implementing the Back – Propagation Algorithm and test the same using appropriate Datasets.
9. Implementation of Ensemble Algorithms
10. Write a Python program to compute Central Tendency Measures, Mean, Median, Mode Measure of Dispersion: Variance, Standard Deviation
11. Study of Python basis Libraries such as Statistics, Math, Numpy and Scipy
12. Write a program to implement simple Linear Regression.
13. Implementation of Decision Tree using sklearn and its parameter tuning.

Pedagogy : Systems, Internet, Group Exercises and PPT.

Name of the Course Designer

1. **Dr.G.Marimuthu**, Assistant Professor & Head, Department of Computer Science, Yadava College – Madurai

2. **Mr .S.Saravanapandian**, Lecturer, Department of Computer Science, Yadava College – Madurai

Elective – II

Course Title: Theory of Computation

Semester : II | **Total Hours/ Semester : 60**
Subject Code : | **Hours of Teaching/Week:4**
Credits :4

Objectives

This course focus on the basic theory of formal method of computation like Automata Theory, Formal Languages, Grammars and Normal Forms of CFG, Closure properties of CFG.

UNIT I **(12 Hours)**

Introduction – Strings – Alphabets – Languages – Graphs – Trees – Inductive proofs–Set notation – Relation – formal languages – Four classes of grammar – phrase structure – context sensitive – context free – Regular – Context free Language – generation tree – ambiguity.

Outcome

- Understood the basic properties of Inductive Proofs, Phrase Structures

UNIT II **(14 Hours)**

Finite automat – Regular Expression – finite state System – Basic definition – NDFSA-Conversion of NDFSA to DFSA – Finite Automata with e-moves – Regular Expression – two way finite automata – finite automata with output – Application of finite automata.

Outcome

- Carry out the conversion of NDFSA to DFSA, Finite Automata.

UNIT III **(12 Hours)**

Acceptance of a regular set by an FSA – construction of a right linear grammar from a finite automation – pushing lemma for regular sets – closure properties of regular sets – minimization of finite automation.

Outcome

- Recognize the principles of FSA, Minimization of finite Automata.

UNIT IV **(11 Hours)**

Context free Grammar – Motivation and introduction – Context – free grammars – Derivation trees – Simplification of Context – free grammars – Chomsky normal form Greibach normal form – The existence of inherently ambiguous context – free languages Properties of Context – free Languages – The pumping lemma for CFL's – Closure Properties of CFL's – Decision algorithms for CFL's.

Outcome

- Identify appropriate Programming Techniques for CFL.

UNIT V **(11 Hours)**

Pushdown Automata (PDA) – Definition – Acceptance of a work by a finite state – Empty store construction of a PDA to accept languages by empty store given a PDA to accept the language by finite state – Definition of a deterministic PDA

Outcome

- Understand the basic concept of PDA.

Pedagogy: Chalk & Talk, Assignments, Group Exercises and Seminar.

Teaching Method

Units	Hours	Mode Pedagogy
I	12	Chalk & Talk
II	14	Chalk & Talk
III	12	Chalk & Talk, Assignment
IV	11	Chalk & Talk, Group Discussion
V	11	Chalk & Talk, Seminar

Textbook

1. "**Introduction To Automata Theory, Languages And Computation"** John E.Hopcroft, Jeffery D.Ullman Narosa Publishing House Pvt. Ltd.
2. **"Automation and Formal languages"** by Putumpekar.,

Reference Books

1. H.R. Lewis and C.H. Papadimitriou, "Elements of the theory of Computation", Second Edition, Pearson Education, 2003.

2. Thomas A. Sudkamp," An Introduction to the Theory of Computer Science,Languages and Machines", Third Edition, Pearson Education, 2007.

3. Raymond Greenlaw an H.James Hoover, " Fundamentals of Theory of Computation, Principles and Practice", Morgan Kaufmann Publishers, 1998.

4. Micheal Sipser, "Introduction of the Theory and Computation", Thomson Brokecole, 1997.

5. J. Martin, "Introduction to Languages and the Theory of computation," Third Edition, Tata Mc Graw Hill, 2007.

WEB REFERENCES

1. https://www.javatpoint.com/theory-of-automata

Name of the Course Designer

Mr. T.Vasantha Kumar, Lecturer, Department of Mathematics, Yadava College – Madurai

Elective – II

Course Title: Data Mining

Semester : II | **Total Hours/ Semester : 60**

Subject Code : | **Hours of Teaching/Week:4**

Credits :4

Objective

To introduce the fundamental concepts of Data Mining techniques, Algorithms used for Information Retrieval from Datasets, Frequent Patterns, Associations and Classification.

Unit I **(12 Hours)**

Data Mining And Data Preprocessing: Data Mining – Motivation – Definition – Data Mining on Kind of Data –Functionalities – Classification – Data Mining Task Primitives – Major Issues in Data Mining – Data Preprocessing – Definition – Data Clearing – Integration and Transformation – Data Reduction.

Outcome

- Understanding the concept of Data Mining and Data Processing

Unit II **(14 Hours)**

Data Warehousing: Multidimensional Data Model – Data Warehouse Architecture – Data Warehouse Implementation –From data Warehousing to Data Mining – On Line Analytical Processing - On Line Analytical Mining.

Outcome

- Understanding the concept of Data model and Warehouse

Unit III **(12 Hours)**

Frequent Patterns, Associations And Classification: The Apriori Algorithm – Definition of Classification and Prediction – Classification by Decision Tree Induction - Bayesian Classification – Rule Based Classification – Classification by Back Propagation – Lazy Learners – K-Nearest Neighbor – Other Classification Methods.

Outcome

- Understanding the concept of Frequent patterns, Associations and classifications

Unit IV **(11 Hours)**

Cluster Analysis: Definition – Types of data in Cluster Analysis – Categorization of major Clustering Techniques – Partitioning Methods - Hierarchical Clustering – BIRCH - ROCK – Grid Based Methods – Model Based Clustering Methods – Outlier Analysis.

Outcome

- Understanding the types of Data in Cluster Analysis

Unit V **(11 Hours)**

Spatial, Multimedia, Text And Web Data: Spatial Data Mining – Multimedia Data Mining – Text Mining – Mining the World Wide Web – Data Mining Applications – Trends in Data Mining.

Outcome

- Understanding the concept of Spatial Data Mining and Trends in Data Mining.

Pedagogy: Chalk & Talk, Assignments, Group Exercises and Seminar.

Teaching Method

Units	Hours	Mode Pedagogy
I	12	Chalk & Talk
II	14	Chalk & Talk
III	12	Chalk & Talk, Assignment
IV	11	Chalk & Talk, Group Discussion
V	11	Chalk & Talk, Seminar

Text Books

1. Jiawei Han and Micheline Kamber, "Data Mining: Concepts and Techniques (The Morgan Kaufmann Series in Data Management Systems) 3rd Edition, July 6, 2011.
2. Ian H. Witten, Eibe Frank, Mark A. Hall, "Data Mining: Practical Machine Learning Tools and Techniques", Elsevier; Third edition, 2014.

References

1. Margret H. Dunham, "Data Mining: Introductory and Advanced Topics", Pearson Education, 2003.
2. M. Awad, Latifur Khan, Bhavani Thuraisingham, Lei Wang, "Design and Implementation of Data Mining Tools", CRC Press- Taylor & Francis Group, 2015.

Web References

https://www.javatpoint.com/data-mining

Name of the Course Designer

1. **Ms. R. Beulah**, Assistant Profesor, Department of Computer Science, Yadava College – Madurai
2. **Mrs.S.Anu**, Lecturer, Department of Computer Science, Yadava College – Madurai

Elective – II

Course Title: Soft Computing

Semester : II **Total Hours/ Semester : 60**

Subject Code : **Hours of Teaching/Week:4**

Credits :4

Objectives

To develop the skills to gain a basic understanding of neural network theory, concept of fuzzy logic theory, artificial neural networks.

UNIT I **(12 Hours)**

Introduction: Soft Computing Constituents – Soft Computing Vs Hard Computing – Characteristics -

Applications - Artificial Neural Network (ANN): Fundamental Concept – Application Scope - Basic Terminologies – Neural Network Architecture – Learning Process – Basic Models of ANN: McCulloch-Pitts Model – Hebb Network – Linear Separability.

Outcome

- Understanding the concepts of ANN, Learning Process.

UNIT II **(12 Hours)**

Supervised Learning Networks: Perceptron Networks – Adaline and Madaline Networks – Back Propagation Network – Radial Basis Function Network. Associative Memory Networks – BAM – Hopfield Network - Boltzmann Machine. Unsupervised Learning Networks: Kohonen Self Organizing Network – Counter Propagation Network – ART Network.

Outcome

- Ability to invoke perceptron networks, Radial Basis Function Network

UNIT III **(12 Hours)**

Fuzzy Sets: Basic Concept – Crisp Set Vs Fuzzy Set - Operations on Fuzzy Set – Properties of Fuzzy Sets – Fuzzy Relations: Concept – Fuzzy Composition – Fuzzy Equivalence and Tolerance Relation - Membership Functions: Features – Fuzzification – Methods of Membership value assignments – Defuzzification – Methods.

Outcome

- Understanding the concept of Fuzzy sets, Defuzzification

UNIT IV **(12 Hours)**

Fuzzy Arithmetic and Decision Making: Extension Principle – Fuzzy Measures – Fuzzy Rules and Fuzzy Reasoning: Fuzzy Propositions – Formation of Rules – Decomposition of Rules – Aggregation of Rules – Approximate Reasoning – Fuzzy Inference and Expert Systems – Fuzzy Decision Making – Fuzzy Logic Control Systems.

Outcome

- Ability to understand Fuzzy Arithmetic and Decision Making

UNIT V **(12 Hours)**

Genetic Algorithm: Fundamental Concept – Basic Terminologies – Traditional Vs Genetic Algorithm - Elements of GA- Encoding - Fitness Function – Genetic Operators: Selection – Cross Over - Inversion and Deletion - Mutation – Simple and General GA – The Schema Theorem - Classification of Genetic Algorithm – Genetic Programming – Applications of GA.

Outcome

- Ability to understand Elements of GA, Genetic Programming

Pedagogy: Chalk & Talk, Assignments, Group Exercises and Seminar.

Teaching Method

Units	Hours	Mode Pedagogy
I	12	Chalk & Talk
II	14	Chalk & Talk
III	12	Chalk & Talk, Assignment
IV	11	Chalk & Talk, Group Discussion
V	11	Chalk & Talk, Seminar

Text Book

1. S.N. Sivanandam, S.N. Deepa, "Principles of Soft Computing", Wiley India, 2007.

Reference Book

1. S. Rajasekaran, G.A.V. Pai, "Neural Networks, Fuzzy Logic, Genetic Algorithms", Prentice Hall India, 2004.

Web References

www.javapoint.com/what-is-soft-computing

Name of the Course Designer

1. **Mr.R.Shanmugaraj**, Lecturer, Department of Computer Science, Yadava College – Madurai
2. **Mrs. A.Priyanka**, Lecturer, Department of Computer Science, Yadava College – Madurai