



HAJEE KARUTHA ROWTHER HOWDIA COLLEGE

(An Autonomous Institution Affiliated to Madurai Kamaraj University, Madurai.)

Uthamapalayam, Theni District. Pin Code: 625 533.

DEPARTMENT OF INFORMATION TECHNOLOGY

MASTER OF SCIENCE – COMPUTER SCIENCE

SYLLABUS

Choice Based Credit System – CBCS

(As per TANSCHER/MKU Guidelines)

with

Outcome Based Education (OBE)

(Academic Year 2020 -2021 onwards)

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Name of the Programme: M.Sc. Information Technology

Choice Based Credit System (CBCS)

(As per TANSCH/ MKU Guidelines)

with

Outcome Based Education (OBE)

(with effect from the Academic Year 2020 – 2021)

College Vision and Mission

Vision

Our vision is to provide the best type of higher education to all, especially to students hailing from minority Muslim community, rural agricultural families and other deprived, under privileged sections of the society, inculcating the sense of social responsibility in them. Our college is committed to produce talented, duty-bound citizens to take up the challenges of the changing times.

Mission

Our mission is to impart and inculcate social values, spirit of service and religious tolerance as envisioned by our beloved Founder President Hajee Karutha Rowther.

The Vision beckons the Mission continues forever.

Programme Educational Objectives (PEO)

Our graduates will be progressive, efficient, value based, academically excellent, creative, collaborative, empowered and globally competent literates with the skills required for societal change.

They will demonstrate

PEO1	Comprehensive knowledge and expertise, employability, the acumen of creative and critical thinking, the spirit of enquiry and professional attitude required for a successful career
PEO2	Accountability, linguistic competence and communication skills in the work environment and beyond
PEO3	Perseverance, effective collaboration, team spirit, leadership and problem solving skills
PEO4	Keen sense of civility, professional ethics, receptivity and moral righteousness
PEO5	Commitment to address social and environmental threats and to act as responsible service-minded, duty-bound global citizens

Department Vision and Mission

Vision

- To transform the students into good citizens and develop them to lead the country as IT professionals

Mission

- To provide the practical skill in developing the simple applications.
- To enrich the students knowledge in the recent trends that the industry is seeking for.
- To impart comprehensive knowledge with equal emphasis on theory and practices.
- To enhance the employability, the students are to be stimulated to work in a team

Programme Outcomes (PO)

On the successful completion of M. Sc., Computer Science programme, the students will be able to

P01	Provide technology-oriented students with the knowledge and ability to develop creative solutions.
P02	Develop skill to learn new technology
P03	Apply computer science theory and software development concept to construct computing-based solutions.
P04	Design and develop computer programs/computer-based system in areas related to algorithms, networking, web design cloud computing Mobile applications.
P05	Engage independent and life-long learning for continued professional development.

Program Specific Outcomes (PSO)

A graduate of M. Sc. Computer Science after two years will

PS01	Graduates are prepared to acquire broad knowledge of Computer Science and a focused understanding of their area of interest.
PS02	Graduates will gain the ability to work effectively as a team member and/or leader in dynamic professional environment
PS03	Graduates will be capable to take up research programmes.
PS04	Graduates are prepared to survive in rapidly changing technology and engage in life-long learning.
PS05	Graduates work effectively in multi-disciplinary and multi-cultural environments by respecting professionalism and ethical practices within organization and society at national and international level.

Programme Scheme

Eligibility

A candidate who has Passed in any degree expected by the syndicate as equivalent with information Technology as one of the subject in UG.

Duration of the Course: Computer Science – 2 years (4 Semesters).

Medium of instruction: English.

For Programme Completion

A Candidate shall complete:

- Part III - Core papers in semesters I, II, III and IV respectively
- Part III - Elective papers in semesters I, II, III and IV respectively
- Part IV - Non- Major Elective papers in semester III

Scheme of Examinations under Choice Based Credit System

Term End Examinations (TEE)	- 75 Marks
Continuous Internal Assessment Examinations (CIAE)	- 25 Marks
Total	- 100 Marks

Pattern of Continuous Internal Assessment Examinations (CIAE)

Average of Two Internal Tests (each 20 marks)	- 20 Marks
Seminar / Quiz / Assignment	- 05 Marks
Total	- 25 Marks

Pattern of Term End Examinations

(Max. Marks: 75 / Time: 3 Hours)

External Examinations Question Paper Pattern

Section – A (10 X 1 = 10 Marks)

Answer ALL questions.

- Questions 1 - 10
- Two questions from each unit
- Multiple choice questions and each question carries Four choices

Section – B (5 X 7 = 35 Marks)

Answer ALL questions choosing either A or B.

- Questions 11 - 15
- Two questions from each unit (either.... or.... type)
- Descriptive Type

Section – C (3 X 10 = 30 Marks)

Answer any THREE out of five questions.

- Questions 16 - 20
- One question from each unit
- Descriptive Type

Passing Marks

Minimum 34 for External Exam

Eligibility for the degree – passing minimum is **50%**

Practical Examination

Internal – 40 marks

External – 60 marks

Total – 100 marks

Passing minimum is **40%**

Weightage

Weightage for Bloom's Taxonomy	Percentage	Marks	
		CIAE	TEE
Knowledge (Remembering) – K1	10	2	7
Understanding – K2	10	3	8
Applying – K3	20	5	15
Analyzing – K4	20	5	15
Evaluating – K5	40	10	30
Gross Total	100	25	75

Assessment

Distribution of questions and marks for Continuous Internal Assessment

Examinations

Bloom's Taxonomy	Section A	Section B	Section C	Total
Knowledge(K1)	3 (3)	1 (a or b) (4)	-----	40 Marks
Understanding(K2)	3 (3)	1 (a or b) (4)	-----	
Apply(K3)	1 (1)	1 (a or b) (4)	1 (8)	
Analyzing (K4)	1 (1)	1 (a or b) (4)	1 (8)	
CIA Examinations conducted for 40 marks and converted to 20 marks				40/2 = 20
Evaluating (K5)	Seminar, Quiz/Assignments			10/2 = 5

Distribution of questions and marks for Term End Examinations

Bloom's Taxonomy	Section A	Section B	Section C	Total
Knowledge(K1)	7 (7)	-----	-----	Total 75 Marks
Understanding(K2)	1 (1)	1 (a or b) (7)	-----	
Apply(K3)	1 (1)	2 (a or b) (14)	-----	
Analyzing (K4)	1 (1)	2 (a or b) (14)	-----	
Evaluating (K5)	-----	-----	3 out of 5 (30)	

Note: Figures in parenthesis are Marks

Details of Course Category, Code, Credits & Title

Course Category	Course Code	Course Title	Hrs	CIAE	TEE	Max. Marks	Credits
Semester – I							
Part – III (OBE)							
Core – I	20PCSC11	Discrete Mathematics	6	25	75	100	4
Core – II	20PCSC12	Data Structures and Algorithms	6	25	75	100	4
Core – III	20PCSC1P	Programming in C++ and Data Structures–Lab	6	40	60	100	4
Core – IV	20PCSC1Q	Dot Net Programming - Lab	6	40	60	100	4
Elective - I	20PCSE11	Advanced System Architecture	6	25	75	100	4
	20PCSE12	Cryptography and Network Security					
Total			30			500	20
Semester – II							
Part – III (OBE)							
Core – V	20PCSC21	Advanced Java Programming	5	25	75	100	4
Core – VI	20PCSC22	Database Management Systems	5	25	75	100	4
Core – VII	20PCSC23	Operating System Principles	5	25	75	100	4
Core – VIII	20PCSC2P	Advanced Java Programming – Lab	5	40	60	100	4
Core – IX	20PCSC2Q	Operating System and Network – Lab	5	40	60	100	4
Elective - II	20PCSE21	Data Communications And Networks	5	25	75	100	4
	20PCSE22	Data Mining					
Total			30			600	24

Course Category	Course Code	Course Title	Hrs	CIAE	TEE	Max. Marks	Credits
Semester – III							
Part – III (OBE)							
Core – X	20PCSC31	Mobile Computing	6	25	75	100	4
Core – XI	20PCSC32	Compiler Design	6	25	75	100	4
Core – XII	20PCSC3P	Open Source Technologies - Lab	5	40	60	100	4
Core – XIII	20PCSC3Q	Mobile Application Development - Lab	5	40	60	100	4
Elective - III	20PCSE31	Cloud Computing	5	25	75	100	4
	20PCSE32	Big Data Analytics					
Part – IV							
NME	20PCSN31	Information and Communication Technology	3	25	75	100	3
Total			30			600	23
Semester – IV							
Part – III (OBE)							
Core – XIV	20PCSC41	Software Engineering	6	25	75	100	6
Core – XV	20PCSC4T	Project Work	18	40	60	100	11
Elective - IV	20PCSE41	Computer Graphics And Multimedia	6	25	75	100	6
	20PCSE42	Digital Image Processing					
Total			30			300	23
Grand Total			120			2000	90

Course Code	Course Title	Category	Total Hours	Credits
20PCSC11	Discrete Mathematics	Core -I	90	4

Nature of Course	
Knowledge Oriented	✓
Skill Oriented	
Employability Oriented	
Entrepreneurship Oriented	

Course Relevance	
Local	
Regional	
National	
Global	✓

Preamble

Understanding the concepts of discrete mathematics and Learning applications of discrete structures in Computer Science.

Course Outcomes (CO)

On the successful completion of the course the students will be able to

No.	Course Outcome	Knowledge Level
CO1	Use standard notations of propositional logic. Be able to prove the two logical expressions are or are not logically equivalent	K1,K2,K3,K4,K5
CO2	Demonstrate different traversal methods for trees and graphs. Model problems in computer science using graphs and trees	K1,K2,K3,K4
CO3	Work in a group to construct finite state machine	K1,K2,K3,K4,K5
CO4	Discriminate, identify and prove the properties of groups and subgroups	K1,K2,K3,K4
CO5	Describe Lattices and Posets and their use.	K1,K2,K3,K4

K1-Knowledge K2-Understand K3-Apply K4- Analyse K5- Evaluate

Mapping of CO with PO

	P01	P02	P03	P04	P05
CO1	3	2	3	1	2
CO2	3	3	3	2	3
CO3	2	3	3	2	1
CO4	1	2	2	3	3
CO5	3	3	3	2	1

1-Low

2-Medium

3-Strong

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	2	3	3	3
CO3	3	3	3	1	2
CO4	2	3	3	3	1
CO5	2	3	3	3	1

1-Low

2-Medium

3-Strong

Syllabus

UNIT I

12 Hours

Mathematical Logic: Introduction – Statements and Notation – Connectives – (AND, OR, NOT) Negation, Conjunction, Disjunction, Conditional and Biconditional – Tautologies, Contradiction, Related Problems – Tautological Implication – Normal Forms – Theory of Inference.

UNIT II

22 Hours

Graph Theory: Basic Concepts – Matrix Representation of Graphs – Shortest Path Problem – Directed Trees – Binary Trees.

UNIT III

24 Hours

Grammers and Languages: Discussion of grammars - Formal definition of a language - Notation of syntax analysis.

Finite Automata: Representation of FA – Acceptability of a String by FA – Non Deterministic FA (NFA) – Acceptability of String by NFA – Equivalence of FA and NFA – Procedure for Finding FA –NFA.

UNIT IV

18 Hours

Algebraic Structures: Groups – Subgroups – Homomorphism – Cosets – Lagrange's Theorem – Normal Subgroups – Semi Groups – Monoids – Homomorphism of Semi Group and Monoids – Sub Semigroups and Submonoids.

UNIT V

14 Hours

Lattices and Boolean algebra: Lattices – Properties – New Lattices Modular and Distribution Lattices. **Boolean algebra:** Boolean Polynomials – Switching Circuits.

Text Books

J.P. Tremblay and R. Manohar, "**Discrete Mathematical Structures with Applications to Computer Science**", TMH, 38th Reprint 2010.

M.K. Venkatraman, N. Sridharan, N. Chandrasekaran, "**Discrete Mathematics**", The National Publishing Company.

Reference Books

Swapan Kumar Sarkar, "*A Textbook Of Discrete Mathematics*", 9th Edition, S Chand.

J. P. Tremblay, R. Manohar, "*Discrete Mathematical Structures with applications to Computer Science*", Tata McGraw-Hill Education Private Limited.

Pedagogy

Chalk & Talk, E-Resources, Group Discussion

Teaching aids

Black Board, LCD Projector

Course Contents and Lecture Schedule

Module No.	Topic	No. of Lectures	Content Delivery Methods
UNIT - I			
1.1	An Introduction	1	Discussion
1.2	Statements and Notation, Connectives	1	Lecture
1.3	(AND,OR, NOT) Negation	2	Lecture
1.4	Conjunction, Disjunction, Conditional and Biconditional	2	Chalk & Talk
1.5	Tautologies, Contradiction, Related Problems	2	Chalk & Talk
1.6	Tautological Implication	2	Chalk & Talk
1.7	Normal Forms	2	Chalk & Talk
UNIT - II			
2.1	Basic Concepts	2	Lecture
2.2	Matrix Representation of Graphs	4	Chalk & Talk
2.3	Shortest Path Problem	6	Chalk & Talk
2.4	Directed Trees	4	Chalk & Talk
2.5	Binary Trees.	6	Chalk & Talk
UNIT - III			
3.1	Discussion of grammars	2	Discussion
3.2	Formal definition of a language	2	Chalk &Talk
3.3	Notation of syntax analysis	2	Chalk &Talk
3.4	Representation of FA	3	Chalk &Talk
3.5	Acceptability of a String by FA	3	Chalk &Talk
3.6	Non-Deterministic FA (NDFa)	3	Chalk & Talk
3.7	Acceptability of String by NDFa	3	Chalk &Talk

3.8	Equivalence of FA and NDFA	3	Chalk &Talk
3.9	Procedure for Finding FA –NDFA	3	Chalk &Talk
UNIT - IV			
4.1	Groups – Subgroups	3	Discussion
4.2	Homomorphism – Cosets	3	Chalk & Talk
4.3	Langrange"s Theorem	3	Chalk & Talk
4.4	Normal Subgroups – Semi Groups	3	Chalk & Talk
4.5	Monoids – Homomorphism of Semi Group and Monoids	3	Chalk & Talk
4.6	Sub Semigroups and Submonoids.	3	Chalk & Talk
UNIT - V			
5.1	Lattices	2	Chalk & Talk
5.2	Properties	2	Chalk & Talk
5.3	New Lattices	2	Chalk & Talk
5.4	Modular and Distribution Lattices	4	Chalk & Talk
5.5	Boolean Polynomials	2	Chalk & Talk
5.6	Switching Circuits	2	Chalk & Talk
Total		90	

Course Designer

Ms. R. Karthigaichelvi

Assistant Professor of Information Technology

Course Code	Course Title	Category	Total Hours	Credits
20PCSC12	Data Structures and Algorithms	Core -II	90	4

Nature of Course	
Knowledge Oriented	✓
Skill Oriented	
Employability Oriented	
Entrepreneurship Oriented	

Course Relevance	
Local	
Regional	
National	
Global	✓

Preamble

Desire for continuous and independent learning analyzing and using data, Appreciation for the dynamic role of solving problems and algorithms.

Course Outcomes (CO)

On the successful completion of the course the students will be able to

No.	Course Outcome	Knowledge Level
CO1	Define basic static and dynamic data structures and relevant standard algorithms for them: stack, queue, dynamically linked lists, trees, graphs, heap, priority queue, hash tables, sorting algorithms, min-max algorithm.	K1,K2,K3,K4,K5
CO2	Outline new solutions for programming problems or improve existing code using learned algorithms and data structures.	K1,K2,K3,K4,K5
CO3	Evaluate algorithms and data structures in terms of time and memory complexity of basic operations.	K1,K2,K3,K4,K5
CO4	Demonstrate advantages and disadvantages of specific algorithms and data structures.	K1,K2,K3,K4,K5
CO5	Determine and demonstrate bugs in program, recognize needed basic operations with data structures.	K1,K2,K3,K4,K5

K1-Knowledge K2-Understand K3-Apply K4- Analyse K5- Evaluate

Mapping of CO with PO

	P01	P02	P03	P04	P05
CO1	3	2	1	3	1
CO2	1	3	1	3	2
CO3	3	3	2	3	3
CO4	3	3	2	3	3
CO5	3	3	2	3	3

1-Low

2-Medium

3-Strong

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	3	1
CO2	1	3	1	3	2
CO3	3	3	2	3	3
CO4	3	3	3	3	3
CO5	3	3	1	3	3

1-Low

2-Medium

3-Strong

Syllabus

UNIT I

18 Hours

Introduction and Overview - Definition - Concept of Data Structure - Overview - Implementation - *Arrays* - Definition - One Dimensional Array - Multidimensional Array - Pointer Array. *Linked List*: Definition - Singly Linked List - Double Linked List - Circular Linked List - Circular Double Linked List - Application - Memory Representation.

UNIT II

18 Hours

Stack: Definition - Representation - Operations - Applications. *Queues*: Definition - Representation - Various Queue Structures - Applications. *Trees*: Definition - Representation - Operation - Types.

UNIT III

18 Hours

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

UNIT IV

18 Hours

Greedy Method: General Method - Optimal Storage on Tapes - Knapsack Problem - Job Sequencing with Deadlines - Optimal Merge Patterns - Minimum Spanning Trees - Single Source Shortest Paths.

UNIT V

18 Hours

Dynamic Programming: General Method – Multistage Graphs – All Pair Shortest Path – Optimal Binary Search Trees – 0/1 Knapsack – Reliability Design – Traveling Salesperson Problem – Flow Shop Scheduling.

Text Books

D. Samantha, *Classic Data Structures*, PHI, 2008.

Unit I : chapters 1 to 3 **Units II:** chapters 4, 5, 7

Ellis Horowitz, SartajSahni, *Fundamentals of Computer Algorithms*, Galgotia Publications, 2010.

Unit III: chapter 3

Unit IV: chapter 4

Unit V: chapter 5

Reference Books

Ellis Horowitz, SartajSahni, *Fundamentals of Computer Algorithms*, Galgotia Publications, 2010.

Pedagogy

Chalk & Talk, E-Resources, Group Discussion

Teaching aids

Black Board, LCD Projector

Course Contents and Lecture Schedule

Module No.	Topic	No. of Lectures	Content Delivery Methods
UNIT - I			
1.1	<i>Introduction and Overview</i>	1	Chalk & Talk
1.2	Definition	1	Discussion
1.3	Concept of Data Structure	1	PPT
1.4	Overview	1	PPT
1.5	Implementation	1	PPT
1.6	<i>Arrays – Definition</i>	1	PPT
1.7	One Dimensional Array	1	PPT
1.8	Multidimensional Array	1	PPT
1.9	Pointer Array	1	PPT
1.10	<i>Linked List: Definition</i>	2	Chalk & Talk
1.11	Singly Linked List	1	Chalk & Talk
1.12	Double Linked List	1	PPT
1.13	Circular Linked List	1	PPT
1.14	Circular Double Linked List	2	PPT

1.15	Application	1	PPT
1.16	Memory Representation	1	PPT
UNIT - II			
2.1	<i>Stack: Definition</i>	1	Discussion
2.2	Representation	2	Chalk & Talk
2.3	Operations	1	PPT
2.4	Applications	1	PPT
2.5	<i>Queues: Definition</i>	1	Chalk & Talk
2.6	Representation	2	PPT
2.7	Various Queue Structures	2	PPT
2.8	Applications	2	PPT
2.9	<i>Trees: Definition</i>	1	Discussion
2.10	Representation	2	PPT
2.11	Operation	2	PPT
2.12	Types	1	PPT
UNIT - III			
3.1	<i>Divide and Conquer</i>	1	PPT
3.2	General Method	2	PPT
3.3	Binary Search	2	PPT
3.4	Finding the Maximum and Minimum	3	Chalk & Talk
3.5	Merge Sort	3	PPT
3.6	Quick Sort	3	PPT
3.7	Selection	2	Chalk & Talk
3.8	Strassen's Matrix Multiplication.	2	PPT
UNIT - IV			
4.1	<i>Greedy Method</i>	1	Discussion
4.2	General Method	2	PPT
4.3	Optimal Storage on Tapes	2	PPT
4.4	Knapsack Problem	3	PPT
4.5	Job Sequencing with Deadlines	2	PPT
4.6	Optimal Merge Patterns	2	Chalk & Talk
4.7	Minimum Spanning Trees	3	PPT
4.8	Single Source Shortest Paths	3	PPT
UNIT - V			
5.1	<i>Dynamic Programming</i>	1	PPT
5.2	General Method	1	Chalk & Talk
5.3	Multistage Graphs	2	PPT
5.4	All Pair Shortest Path	2	PPT

5.5	Optimal Binary Search	2	PPT
5.6	Trees	2	Chalk & Talk
5.7	0/1 Knapsack	3	PPT
5.8	Reliability Design	2	PPT
5.9	Traveling Salesperson Problem	2	PPT
5.10	Flow Shop Scheduling	1	PPT
Total		90	

Course Designer

Mr. Z. Abdul Basith

Assistant Professor of Information Technology

Course Code	Course Title	Category	Total Hours	Credits
20PCSC1P	Programming in C++ and Data Structures – Lab	Core -III	90	4

Nature of Course	
Knowledge Oriented	
Skill Oriented	✓
Employability Oriented	
Entrepreneurship Oriented	

Course Relevance	
Local	
Regional	
National	
Global	✓

Preamble

Acquire knowledge on Data structure algorithms with Object-oriented programming concepts using C++.

Course Outcomes (CO)

On the successful completion of the course the students will be able to

No.	Course Outcome	Knowledge Level
CO1	Apply the friend function, overloading operator concepts	K1,K2,K3
CO2	Describe the use of different inheritance types	K1,K2,K3
CO3	Describe the various sorting methods	K1,K2,K3,K4
CO4	Develop the concept of pointers	K1,K2,K3,K4,K5
CO5	Analyze the data structure algorithms	K1,K2,K3,K4,K5

K1-Knowledge K2-Understand K3-Apply K4- Analyse K5- Evaluate

Mapping of CO with PO

	P01	P02	P03	P04	P05
CO1	1	1	2	2	1
CO2	1	1	2	1	2
CO3	1	1	1	2	3
CO4	2	1	1	1	3
CO5	1	2	1	2	2

1-Low

2-Medium

3-Strong

Mapping of CO with PS0

	PS01	PS02	PS03	PS04	PS05
CO1	1	1	2	2	1
CO2	1	1	2	1	2
CO3	1	1	1	2	3
CO4	2	1	1	1	3
CO5	1	2	1	2	2

1-Low

2-Medium

3-Strong

Syllabus

UNIT I	18 Hours
1. To find minimum objects using friend two numbers between two class objects using friend function. 2. To overload Binary + operator this adds two complex numbers. 3. To process students mark list using multiple inheritance.	
UNIT II	18 Hours
1. Process employee details using hierarchical inheritance. 2. To process family details using hybrid inheritance 3. To sort number using Merge sort.	
UNIT III	18 Hours
1. To sort number using quick sort. 2. To sort number using Heap sort. 3. To search a element using linear search using C++.	
UNIT IV	18 Hours
1. To perform stack operations using pointer. 2. To perform queue operations using pointer. 3. To manipulate singly linked list	
UNIT V	18 Hours
1. To manipulate doubly linked list. 2. To implement binary search using C++. 3. To perform tree traversals.	

Text Books

P. Rizwan Ahmed, *Programming In C++ And Data Structure*.

Reference Books

C.H.V. Raghavendran and Ganti Naga Satish *Data Structures through C++*

Course Designer

Mr. K. Iscaq Faizal

Assistant Professor of Information Technology

Course Code	Course Title	Category	Total Hours	Credits
20PCSC1Q	Dot Net Programming- Lab	Core -IV	90	4

Nature of Course	
Knowledge Oriented	
Skill Oriented	✓
Employability Oriented	
Entrepreneurship Oriented	

Course Relevance	
Local	
Regional	
National	
Global	✓

Preamble

Students will gain the ability to implement the algorithms in *C#.net*, *VB.net* and *ASP.net*. Pre-requisite.

Course Outcomes (CO)

On the successful completion of the course the students will be able to

No.	Course Outcome	Knowledge Level
CO1	Develop algorithmic step to solve Problem and resolving skills-to analyze real life problem.	K1,K2,K3,K4,K5
CO2	Select and Set up a programming environment in HTML.	K1,K2,K3,K4,K5
CO3	Developing Tools in VB. NET.	K1,K2,K3,K4
CO4	Make use of Tools and Experience with developing and debugging software in ASP DOT NET.	K1,K2,K3,K4,K5
CO5	Plan and Configure an VB.NET, ASP.NET applications.	K1,K2,K3,K4,K5

K1-Knowledge K2-Understand K3-Apply K4- Analyse K5- Evaluate

Mapping of CO with PO

	P01	P02	P03	P04	P05
CO1	3	3	2	3	3
CO2	3	2	2	3	3
CO3	3	3	3	3	3
CO4	3	3	2	3	3
CO5	3	3	2	3	3

1-Low

2-Medium

3-Strong

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	3	3
CO2	3	2	2	3	3
CO3	3	3	3	3	3
CO4	3	3	2	3	3
CO5	3	3	2	3	3

1-Low

2-Medium

3-Strong

Syllabus

UNIT I

10 Hours

HTML:

1. To Write a Time Table Program by using Html Tags.
2. To Create an E-Mail Registration Form by using Html Tags.

UNIT II

15 Hours

VB DOT NET:

1. To Write a Constructor & Destructor Program by using Console Application in Vb.net.
2. To Write a Inheritance Program by using Console Application in Vb.net.
3. To Create a Procedure by using Windows Application in Vb.net.

UNIT III

15 Hours

VB DOT NET

1. To Write an Exception Handling Program by using Windows Application in Vb.net.
2. To Create a Validation Form by using Windows Application in Vb.net.
3. To write a String Handling Program by using Windows Application in Vb.net.

UNIT IV

25 Hours

1. To Write a Validation Control Program by using Asp.net.
2. To Create a Calendar Control by using Asp.net.
3. To Create a Ad rotator Control by using Asp.net.
4. To Create a Web Service by using Asp.net.
5. To Create a Database Connectivity by using ADO.NET

UNIT V

25 Hours

1. To create a Polymorphism by using C#.NET.
2. To create a Abstraction and Encapsulation by using C#.NET.
3. To create a Matrix Multiplication by using C#.NET.
4. To create a Reverse Number by using C#.NET.

Text Books

Black Book, ***"ASP.NET 4.5"*** (Covers c# and VB codes), Dreamtech Press India Pvt. Ltd.

Daminni Crover, ***"DOT NET TECHNOLOGY"***, I K International Publishing House Pvt. Ltd, 2011.

Reference Books

Bipin Joshi, ***"Beginning Database Programming Using ASP.NET Core3"***.

Joel Murach, Mary Delamater, ***"Murachi's ASP.NET Core MVC"***.

Course Designer

Ms. G. Manonmani

Assistant Professor of Information Technology

Course Code	Course Title	Category	Total Hours	Credits
20PCSE11	Advanced System Architecture	Elective -I	90	4

Nature of Course	
Knowledge Oriented	✓
Skill Oriented	
Employability Oriented	✓
Entrepreneurship Oriented	

Course Relevance	
Local	
Regional	
National	
Global	✓

Preamble

To study about a computer system it is basically a machine that simplifies complicated tasks and it should maximize performance and reduce costs as well as power consumption.

Course Outcomes (CO)

On the successful completion of the course the students will be able to

No.	Course Outcome	Knowledge Level
CO1	Identify with the Concept of Parallel Processing and its Computer Architecture applications	K1,K2,K3,K4,K5
CO2	define Symmetric shared-memory architectures and their performance and efficiency in advanced multiple-issue processors	K1,K2,K3
CO3	Describe basic concept of parallel computing	K1,K2,K3,K4,K5
CO4	Evaluate the organization and operation of current generation parallel computer systems, including multiprocessor and multi core systems	K1,K2,K3,K4,K5
CO5	Identify the elements of modern instructions sets and their impact on processor design	K1,K2,K3,K4,K5

K1-Knowledge K2-Understand K3-Apply K4- Analyse K5- Evaluate

Mapping of CO with PO

	P01	P02	P03	P04	P05
CO1	3	3	1	3	3
CO2	3	3	3	2	3
CO3	3	3	2	3	3
CO4	2	2	3	3	3
CO5	3	3	2	3	2

1-Low

2-Medium

3-Strong

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	1	2	3
CO3	3	3	2	3	1
CO4	3	3	2	3	3
CO5	2	3	3	3	2

1-Low

2-Medium

3-Strong

Syllabus

UNIT I

19 Hours

Introduction to Advanced Computer Architecture and Parallel Processing : Four Decades of Computing – Flynn’s Taxonomy of Computer Architecture – SIMD Architecture – MIMD Architecture – Interconnection Networks Multiprocessors Interconnection Networks : Interconnection Networks Taxonomy – Bus-Based Dynamic Interconnection Networks – Switch Based Interconnection Networks – Analysis and performance Metrics.

UNIT II

19 Hours

Shared Memory Architecture : Classification of shared memory Systems – Bus-Based Symmetric Multiprocessors -- Basic Cache Coherency Methods – Snooping Protocols – Directory Based Protocols – Shared Memory Programming – Message Passing Architecture: Introduction To Message Passing –Routing in Message Passing Networks – Switching Mechanism in Message Passing – Message Passing Programming Models - Processor Support For Message Passing – Example Message Passing Architectures - Message Passing versus Shared Memory Architectures.

UNIT III

17 Hours

Abstract Models: The PRAM Model and Its Variations – Simulating Multiple access on an EREW PRAM – Analysis of parallel Algorithms – Computing sum and All Sums – Matrix Multiplication – Sorting - Message Passing Model – Leader Election Problem – Leader Election in Synchronous Rings.

UNIT IV

20 Hours

Parallel Programming in Parallel Virtual Machine : PVM Environment and Application Structure – Task Connection – Task Groups – Communication among Tasks – Task synchronization – 6 Reduction operations – Message Passing Interface (MPI) : Communicators – Virtual Topologies – Task Communication – Synchronization – Collective Operations – Task Creations- One-Sided Communication.

UNIT V

15 Hours

Scheduling and Task Allocation: The scheduling problem-scheduling DAG's without Considering Communication- Communication Models- scheduling DAG's with Communication – The NP completeness of the scheduling problem- Heuristic Algorithms – Task Allocation – Scheduling in heterogeneous environments.

Text Books

Hesham El-Rewini and Mostafa Abo-El-Barr, "***Advanced Computer Architecture and Parellel Processing***", A John Wiley & sons inc Publication, 2005.

UNIT I : Chapter 1.1 to 1.5 & Chapter 2.1, to 2.5

UNIT II : Chapter 4.1 to 4.6 & Chapter 5.1 to 5.7

UNIT III : Chapter 6.1 to 6.9

UNIT IV : Chapter 8.1 to 8.6 & Chapter 9.1 to 9.7

UNIT V : Chapter 10.1 to 10.8

Reference Books

Kai Hwang & F. A. Briggs, "***Computer Architecture and Parallel Processing***", McGraw Hill 2013.

DezsoSima, Terence Fountain, Peter Kacsuk, "***Advanced Computer Architectures – A Design Space Approach***", Pearson Education, 2009.

Kai Hwang, "***Advanced Computer Architecture – Parallelism, Scalability, Programmability***", Tata McGraw Hill, 2008.

John L. Hennessey and david A. Patterson, "***Computer Architecture – A quantative approach***", Morgan Kausmann / Elsevier Publishers, 5th Edition.

Pedagogy

Chalk & Talk, E-Resources, Group Discussion

Teaching aids

Black Board, LCD Projector

Course Contents and Lecture Schedule

Module No.	Topic	No. of Lectures	Content Delivery Methods
UNIT - I			
1.1	Introduction to Advanced Computer Architecture and Parallel Processing: Four Decades of Computing	2	Discussion

1.2	Flynn's Taxonomy of Computer Architecture	2	PPT
1.3	SIMD Architecture	2	PPT
1.4	MIMD Architecture	2	PPT
1.5	Interconnection Networks	1	PPT
1.6	Multiprocessors Interconnection Networks	2	PPT
1.7	Interconnection Networks Taxonomy	2	PPT
1.8	Bus-Based Dynamic Interconnection Networks	2	PPT
1.9	Switch Based Interconnection Networks	2	PPT
1.10	Analysis and performance Metrics	2	PPT
UNIT - II			
2.1	Shared Memory Architecture: Classification of shared memory Systems	2	PPT
2.2	Bus-Based Symmetric Multiprocessors	2	PPT
2.3	Basic Cache Coherency Methods	1	PPT
2.4	Snooping Protocols	2	PPT
2.5	Directory Based Protocols	1	PPT
2.6	Shared Memory Programming	1	PPT
2.7	Message Passing Architecture: Introduction To Message Passing	1	Chalk & Talk
2.8	Routing in Message Passing Networks	2	PPT
2.9	Switching Mechanism in Message Passing	2	PPT
2.10	Message Passing Programming Models	1	PPT
2.11	Processor Support For Message Passing	2	PPT
2.12	Example Message Passing Architectures	1	PPT
2.13	Message Passing versus Shared Memory Architectures	1	PPT
UNIT - III			
3.1	Abstract Models: The PRAM Model and Its Variations	2	PPT
3.2	Simulating Multiple access on an EREW PRAM	2	Chalk & Talk
3.3	Analysis of parallel Algorithms	2	PPT
3.4	Computing sum and All Sums	2	PPT
3.5	Matrix Multiplication	2	PPT
3.6	Sorting	1	PPT
3.7	Message Passing Model	2	PPT

3.8	Leader Election Problem	2	PPT
3.9	Leader Election in Synchronous Rings	2	PPT
UNIT - IV			
4.1	Parallel Programming in Parallel Virtual Machine: PVM Environment and Application Structure	2	Discussion
4.2	Task Connection	2	PPT
4.3	Task Groups	1	PPT
4.4	Communication among Tasks	1	PPT
4.5	Task synchronization	1	PPT
4.6	6 Reduction operations	2	PPT
4.7	Message Passing Interface (MPI): Communicators	2	PPT
4.8	Virtual Topologies	2	PPT
4.9	Task Communication	1	PPT
4.10	Synchronization	2	Discussion
4.11	Collective Operations	2	PPT
4.12	Task Creations	1	PPT
4.13	One-Sided Communication	1	PPT
UNIT - V			
5.1	<i>Scheduling and Task Allocation: The scheduling problem</i>	2	PPT
5.2	scheduling DAG's without Considering Communication	2	Chalk & Talk
5.3	Communication Models	2	PPT
5.4	Scheduling DAG's with Communication	1	PPT
5.5	The NP completeness of the scheduling problem	2	PPT
5.6	Heuristic Algorithms	2	PPT
5.7	Task Allocation	2	PPT
5.8	Scheduling in heterogeneous environments	2	PPT
Total		90	

Course Designer

Mr. Z. Abdul Basith

Assistant Professor of Information Technology

Course Code	Course Title	Category	Total Hours	Credits
20PCSE12	Cryptography and Network Security	Elective -I	90	4

Nature of Course	
Knowledge Oriented	✓
Skill Oriented	
Employability Oriented	
Entrepreneurship Oriented	

Course Relevance	
Local	
Regional	
National	
Global	✓

Preamble

To understand various protocols for network security to protect against the threats in the networks.

Course Outcomes (CO)

On the successful completion of the course the students will be able to

No.	Course Outcome	Knowledge Level
CO1	Choose the most common type of cryptographic algorithm and Encryption Techniques	K1,K2,K3
CO2	Choose the Encryption standard and Block Chipers operations.	K1,K2,K3
CO3	Define the Public-Key Infrastructure and Algorithm	K1,K2,K3,K4
CO4	Analyze vulnerability assessments and the weakness of using passwords for authentication and Be able to perform simple vulnerablility assessments and password audits.	K1,K2,K3,K4,K5
CO5	Assemble digitally sign emails and files and able to configure simple firewall architectures and Understand Virtual Private Networks	K1,K2,K3,K4,K5

K1-Knowledge K2-Understand K3-Apply K4- Analyse K5- Evaluate

Mapping of CO with PO

	P01	P02	P03	P04	P05
CO1	2	1	2	2	3
CO2	1	2	2	1	2
CO3	1	1	2	2	2
CO4	2	1	1	2	3
CO5	1	1	2	2	2

1-Low

2-Medium

3-Strong

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	1	2	2	3
CO2	1	2	2	1	2
CO3	1	1	2	2	2
CO4	2	1	1	2	3
CO5	1	1	2	2	2

1-Low

2-Medium

3-Strong

Syllabus

UNIT I

18 Hours

Classical Encryption Technique: Symmetric Cipher Model – Substitution Techniques- Transposition Techniques- Rotor Machines – Steganography.
Block Ciphers and The Data Encryption Standard: Traditional Block Cipher Structure – The Data Encryption Standard- A DES Example – The Strength of DES- Block Cipher Design Principles.

UNIT II

18 Hours

Advanced Encryption Standard: Finite Field Arithmetic- AES Structure- AES Transformation Functions – AES Key Expansion- An AES example- AES Implementation. **Block Cipher Operation:** Multiple Encryption and Triple DES- Electronic Code Book- Cipher Block Chaining Mode- Cipher Feedback Mode- Output Feedback Mode – counter Mode – XTS – AES Mode for Block – Oriented Storage Devices.

UNIT III

18 Hours

Public – Key Cryptography and RSA: Principles of Public-Key Cryptosystems- The RSA Algorithm. **Other Public – Key Cryptosystems:** Diffie - Hellman Key Exchange - Elgamal Cryptographic System- Elliptic Curve Arithmetic – Elliptic Curve Cryptography - Pseudorandom Number Generation Based on an Asymmetric Cipher.

UNIT IV

18 Hours

Cryptographic Hash Functions: Two Simple Hash Functions- Requirements and Security- Hash Functions based on Cipher Block Chaining – Secure Hash Algorithm (SHA) – SHA-3. **Message Authentication Codes:** Message Authentication Requirements- Message Authentication Functions – Requirements for Message Authentication Codes – Security of MACs- MACs based on Hash Functions:(HMAC)- MACs Based on Block Ciphers: DAA and CMAC.

UNIT V

18 Hours

Digital Signatures: Digital Signatures- Elgamal Digital Signature Scheme- Schnorr digital Signature Scheme- NIST Digital Signature Algorithm- Elliptic Curve Digital Signature Algorithm- RSA-PSS Digital Signature Algorithm. **User Authentication:** Remote User-Authentication Principles- Remote user- Authentication Using Symmetric Encryption- Kerberos- Remote User Authentication Using Asymmetric encryption- Federated Identity Management- Personal Identity Verification.

Text Books

William Stallings, *“Cryptography and Network Security- Principles and Practice”*, Sixth Edition, Published by Pearson Education Inc – 2014.

Reference Books

C K Shyamala, N Harini and Dr. T R Padmanabhan, *“Cryptography and Network Security”*, Wiley India Pvt. Ltd.

Behrouz A. Foruzan, *“Cryptography and Network Security”*, Tata McGraw Hill 2007.

Charlie Kaufman, Radia Perlman, and Mike Speciner, *“Network Security: PRIVATE Communication in a PUBLIC World”*, Prentice Hall.

Pedagogy

Chalk & Talk, E-Resources, Group Discussion

Teaching aids

Black Board, LCD Projector, Charts and Mind Maps

Course Contents and Lecture Schedule

Module No.	Topic	No. of Lectures	Content Delivery Methods
UNIT - I			
1.1	Symmetric Cipher Model	1	Chalk & Talk
1.2	Substitution Techniques	2	Chalk & Talk
1.3	Transposition Techniques	2	Chalk & Talk
1.4	Rotor Machines	2	Chalk & Talk
1.5	Steganography	1	Chalk & Talk
1.6	Traditional Block Cipher Structure	2	PPT
1.7	The Data Encryption Standard	2	PPT
1.8	A DES Example	2	Chalk & Talk
1.9	The Strength of DES	2	Chalk & Talk

1.10	Block Cipher Design Principles	2	Chalk & Talk
UNIT - II			
2.1	Finite Field Arithmetic	2	Chalk & Talk
2.2	AES Structure	2	PPT
2.3	AES Transformation Functions	2	Chalk & Talk
2.4	AES Key Expansion	1	Chalk & Talk
2.5	An AES example	1	Chalk & Talk
2.6	AES Implementation	2	Chalk & Talk
2.7	Multiple Encryption and Triple DES	2	Chalk & Talk
2.8	Electronic Code Book	1	PPT
2.9	Cipher Block Chaining Mode	1	PPT
2.10	Cipher Feedback Mode	1	Chalk & Talk
2.11	Output Feedback Mode	1	Chalk & Talk
2.12	Counter Mode	1	Chalk & Talk
2.13	XTS - AES Mode for Block - Oriented Storage Devices.	1	PPT
UNIT - III			
3.1	Principles of Public-Key Cryptosystems	2	Chalk & Talk
3.2	The RSA Algorithm	2	Chalk & Talk
3.3	Diffie-Hellman Key Exchange	2	Chalk & Talk
3.4	Elgamal Cryptographic System	3	Chalk & Talk
3.5	Elliptic Curve Arithmetic	3	PPT
3.6	Elliptic Curve Cryptography	3	PPT
3.7	Pseudorandom Number Generation Based on an Asymmetric Cipher.	3	Chalk & Talk
UNIT - IV			
4.1	Application of Cryptographic Hash Function	2	Chalk & Talk
4.2	Two Simple Hash Functions	1	Chalk & Talk
4.3	Requirements and Security	2	Chalk & Talk
4.4	Hash Functions based on Cipher Block Chaining	2	PPT
4.5	Secure Hash Algorithm(SHA)	1	PPT
4.6	SHA-3	1	PPT
4.7	Message Authentication Requirements	1	Chalk & Talk
4.8	Message Authentication Functions	1	Chalk & Talk
4.9	Requirements for Message Authentication Codes	1	Chalk & Talk
4.10	Security of MACs	2	Chalk & Talk

4.11	MACs based on Hash Functions:(HMAC)	2	Chalk & Talk
4.12	MACs Based on Block Ciphers: DAA and CMAC	2	Chalk & Talk
UNIT - V			
5.1	Digital Signatures	1	PPT
5.2	Elgamal Digital Signature Scheme	2	PPT
5.3	Schnorr digital Signature Scheme	2	PPT
5.4	NIST Digital Signature Algorithm	2	Chalk & Talk
5.5	Elliptic Curve Digital Signature Algorithm	2	Chalk & Talk
5.6	RSA-PSS Digital Sinature Algorithm	2	Chalk & Talk
5.7	Remote User-Authentication Principles	2	Chalk & Talk
5.8	Remote user - Authentication Using Symmetric Encryption	1	Chalk & Talk
5.9	Kerberos	1	PPT
5.10	Remote User Authentication Using Asymmetric encryption	1	PPT
5.11	Federated Identity Management	1	Chalk & Talk
5.12	Personal Identity Verification	1	Chalk & Talk
Total		90	

Course Designer

Mr. A. Peer Mohamed

Assistant Professor of Information Technology

Course Code	Course Title	Category	Total Hours	Credits
20PCSC21	Advanced Java Programming	Core -V	75	4

Nature of Course	
Knowledge Oriented	✓
Skill Oriented	
Employability Oriented	✓
Entrepreneurship Oriented	

Course Relevance	
Local	
Regional	
National	
Global	✓

Preamble

To enable the students to understand the advanced java Programming will have Java development skills necessary to be an effective team member on medium to large scale projects.

Course Outcomes (CO)

On the successful completion of the course the students will be able to

No.	Course Outcome	Knowledge Level
CO1	Elaborate and Develop Swing –based GUI Components	K1,K2
CO2	Develop Client/Server Applications using Socket Programming and Database Connectivity	K1,K2,K3
CO3	Evaluate a JSP applications and server side Servlet concept.	K1,K2,K3,K4,K5
CO4	Develop distributed applications using RMI and CORBA	K1,K2,K3,K4
CO5	Develop and implement the android applications programs.	K1,K2,K3,K4,K5

K1-Knowledge K2-Understand K3-Apply K4- Analyse K5- Evaluate

Mapping of CO with PO

	P01	P02	P03	P04	P05
CO1	3	2	1	3	3
CO2	3	3	3	2	3
CO3	3	3	2	3	1
CO4	2	1	3	2	2
CO5	3	3	3	1	2

1-Low

2-Medium

3-Strong

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	2	2	2	3	1
CO3	3	3	1	2	2
CO4	2	2	3	2	3
CO5	1	3	3	2	1

1-Low

2-Medium

3-Strong

Syllabus

UNIT I

12 Hours

Layout Management: Border Layout, Grid Layout, Grid bag Layout, Group Layout, Custom layout Managers. **Text Input:** Text Fields, Password Fields, Text Areas, Scroll Pane, Label and Labeling Components. **Choice Components:** Check Boxes, Radio Buttons, Borders, Combo Boxes. **Sliders** **Menus:** Menu Building, Icons in Menu Items, Check box and Radio Buttons in Menu Items, Pop-up Menus, Keyboard Mnemonics and Accelerators, Enabling and Design menu Items, Toolbars, Tooltips. **Dialog Boxes:** Option Dialogs, Creating Dialogs, Data Exchange, File Choosers, and Color Choosers Components Organizers: Split Panes, Tabbed Panes, Desktop Panes and Internal Frames, Cascading and Tiling. **Advance Swing Components:** List, Trees, Tables, Progress Bars.

UNIT II

16 Hours

Networking: Internet Addressing, Inet Address, Factory Methods, Instance Methods, TCP/IP Client Sockets, URL, URL Connection, TCP/IP Server Sockets, Datagram.

Java Database Connectivity (JDBC): Merging Data from Multiple Tables: Joining, Manipulating Databases with JDBC.

UNIT III

16 Hours

Servlets: Servlet Overview and Architecture, Interface Servlet and the Servlet Life Cycle, Handling HTTP get Requests, Handling HTTP post Requests, Redirecting Requests to Other Resources, Session Tracking, Cookies, Session Tracking with HttpSession.

Java Server Page (JSP): Introduction, Java Server Pages Overview, A First Java Server Page Example, Implicit Objects, Scripting, Standard Actions, Directives, Custom Tag Libraries.

UNIT IV

16 Hours

Remote Method Invocation (RMI): Defining the Remote Interface, Implementing the Remote Interface, Compiling and Executing the Server and the Client.

Common Object Request Broker Architecture (CORBA): Technical/Architectural Overview, CORBA Basics, CORBA service.

UNIT V

15 Hours

Introduction Smart Phone Application Development: Introduction to android platform, Creating application template, adding activity, intent, services to application, using Google map API.

Text Books

H. M. Deitel, P. J. Deitel, S. E. Santry. *“Advanced Java 2 Platform How To Program”* Prentice Hall.

Steven Holzner, *“Java 2 Programming-AWT, Swing, XML and Java Beans Black Book”*, Dreamtech.

Reference Books

Antonio Goncalves *“Beginning Java™ EE 6 Platform with GlassFish 3 From Novice to Professional”* – Apress Publication.

Cay Horstmann and Grazy Cornell, *“Core Java Volume I-Fundamentals”*, 8th Edition.

Cay Horstmann and Grazy Cornell, *“Core Java Volume II-Advance Features”* 8th Edition.

Pedagogy

Chalk & Talk, E-Resources, Group Discussion

Teaching aids

Black Board, LCD Projector

Course Contents and Lecture Schedule

Module No.	Topic	No. of Lectures	Content Delivery Methods
UNIT - I			
1.1	Border, Group, Grid, Grid bag and Custom Layout Managers.	2	Chalk & Talk
1.2	Text box, Text area, Password field, Radio button, Label, Scroll pane, Check box and Combo box	3	PPT

1.3	Pop-up menu, Keyboard Mnemonics and Accelerators, Toolbar and Tooltips.	3	LCD Projector
1.4	Option dialog, File Chooser, Split pane, Tabbed Pane, Internal frames Cascading and Tiling.	2	LCD Projector
1.5	Advanced Swing like JList, JTree, JTable and Progress Bar	2	PPT
UNIT - II			
2.1	Internet Addressing, Inet address Factory Methods and Instance Methods	2	LCD Projector
2.2	TCP/IP Client Sockets	3	Chalk & Talk
2.3	URL and URL Connection	2	PPT
2.4	TCP/IP Server Sockets and Datagram's	2	PPT
2.5	Data base Connectivity	1	LCD Projector
2.6	Merging,	2	PPT
2.7	Joining,	2	LCD Projector
2.8	Manipulating	2	PPT
UNIT - III			
3.1	Servlet Architecture	1	PPT
3.2	Life cycle	2	PPT
3.3	Handling HTTP Get and Post Request.	2	LCD Projector
3.4	Session Tracking and Cookies	3	Chalk & Talk
3.5	JSP Overview, example, implicit Objects	2	LCD Projector
3.6	Standard Actions, Directives,	3	PPT
3.7	Custom tag Libraries	3	LCD Projector
UNIT - IV			
4.1	RMI- Define	2	Chalk & Talk
4.2	Remote interface	2	LCD Projector
4.3	Implement the remote interface	2	PPT
4.4	Compiling and executing the server and client.	3	PPT
4.5	CORBA- Architecture	1	Chalk & Talk
4.6	Overview,	2	Chalk & Talk
4.7	Basics	2	PPT
4.8	Services	2	LCD Projector

UNIT - V			
5.1	Introduction to android platform	3	PPT
5.2	Creating Application Templates.	3	LCD Projector
5.3	Adding Activity	3	Chalk & Talk
5.4	Intent Services to application	3	LCD Projector
5.5	Google map API	3	PPT
Total		75	

Course Designer

Mr. A. K. Jenarthanan

Assistant Professor of Information Technology

Course Code	Course Title	Category	Total Hours	Credits
20PCSC22	Database Management Systems	Core -VI	75	4

Nature of Course	
Knowledge Oriented	✓
Skill Oriented	
Employability Oriented	✓
Entrepreneurship Oriented	

Course Relevance	
Local	
Regional	
National	
Global	✓

Preamble

To enable the students to understand DBMS architecture and design, Identify basic database storage structures and concurrency control techniques, database models such as distributed, network and object oriented database models.

Course Outcomes (CO)

On the successful completion of the course the students will be able to

No.	Course Outcome	Knowledge Level
CO1	Describe DBMS architecture, physical and logical designs, database modeling, relational, hierarchical and network models.	K1,K2
CO2	Understanding of normalization theory and apply such knowledge to the normalization of a database	K1,K2,K3
CO3	Identify database storage structures and access techniques such as file organizations, indexing methods and hashing.	K1,K2,K3,K4,K5
CO4	Understand various transaction processing, concurrency control mechanisms and database protection mechanisms.	K1,K2,K3,K4
CO5	Apply the various database models, advanced database technologies and products used in enterprise	K1,K2,K3,K4,K5

K1-Knowledge K2-Understand K3-Apply K4- Analyse K5- Evaluate

Mapping of CO with PO

	P01	P02	P03	P04	P05
CO1	3	3	3	3	3
CO2	3	3	3	2	3
CO3	3	3	3	3	1
CO4	3	3	3	3	2
CO5	3	3	2	1	1

1-Low

2-Medium

3-Strong

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	2	2	3
CO3	3	2	3	3	1
CO4	3	3	3	2	1
CO5	3	3	2	1	1

1-Low

2-Medium

3-Strong

Syllabus

UNIT I

12 Hours

Data and management - Database systems-and organization, DBMS, functions and components - Data dictionary and users. Database Architecture and Design: Data abstraction -ANSI/SPARC - database languages, design and constraints – Data models: Hierarchical, network, relational, ER objects oriented and object relational models. Entity Relationship Modeling: ER modeling: components and conventions, relationships, composite entities, ERDS and symbols.

UNIT II

16 Hours

Terminology, data structure, data manipulation, codd's rules–Integrity constraints - Normalization: relational database design, decomposition, functional dependencies, keys, normal forms, de-normalization - Relational Data Integrity and Database Constraints – Data Normalization. Relational algebra: operations, aggregate function, UPDATE operations,. Relational Calculus: Tuple relation and domain relation calculus.

UNIT III

16 Hours

Magnetic tapes, drives and optical disk, MO drives. Files, File Organization and file Structures: operations, file storage, sequential and direct file organization, physical storage media and hierarchy - Buffer manager, file organization and file structures and record types. Indexing and Hashing:

UNIT IV

16 Hours

Environment, security risks dimensions, security requirements, data protection, granting and revoking privileges - data encryption, integrity, availability, security practices, network security, security auditing. Transaction Management and concurrency Control: properties, database structure transaction states, concurrency control, serializability, concurrency control schemes, transaction management and recovery, Commands. Backup and Recovery: Database backups, causes and failures, logs recovery and data access, recovery facilities and techniques, multi database systems.

UNIT V

15 Hours

Client/Server Databases: benefits and costs, application architecture, two-tier and three-tier architecture. Distributed Databases: homogeneous and heterogeneous databases, distributed data storage advantages and disadvantages, architecture, two pass mechanisms, functions. Hierarchical and Network Databases – Object oriented and Object Relational Databases: Need, characteristics, comparison of ODBMS and RDBMS, OODBMS and ORDBMS.

Text Books

Alexis Leon Mathews Leon, *“Essentials of Database Management Systems”*
Vijay Nicole Imprints Pvt. Ltd, 2006

Unit I: Chapters 1-4, Unit II: Chapters 6-10, Unit III: Chapters 19-21,
Unit IV: Chapters 22 – 24, Unit V: Chapters 25 - 28

Reference Books

Abraham Silberschatz, Henry F. Korth, S. Sundran, *“Database System Concepts”*
5th Edition, TMH, 2006.

Pedagogy

Chalk & Talk, E-Resources, Group Discussion

Teaching aids

Black Board, LCD Projector

Course Contents and Lecture Schedule

Module No.	Topic	No. of Lectures	Content Delivery Methods
UNIT - I			
1.1	Data and management, systems & organization	1	Chalk & Talk
1.2	DBMS, functions and components,	1	PPT
1.2	Data dictionary and users	1	Chalk & Talk
1.4	Database architecture, abstraction, ANSI/SPARC	2	Chalk & Talk
1.5	database languages, design and constraints	1	PPT
1.6	Data models: Hierarchical, network, relational	2	PPT
1.7	ER object oriented and object relational models	1	PPT
1.8	ER modeling: components and conventions	1	PPT
1.9	relationships, composite entities, ERDS symbols	2	PPT
UNIT - II			
2.1	RDBMS: Terminology	1	Chalk & Talk
2.2	data structure, data manipulation, codd's rules	2	Chalk & Talk
2.3	Integrity constraints	1	PPT
2.4	Normalization:, relational database design	2	PPT
2.5	Decomposition, functional dependencies	2	Chalk & Talk
2.6	Keys, normal forms, de-normalization	1	Chalk & Talk
2.7	Relational algebraic operations	2	Chalk & Talk
2.8	Aggregate function, UPDATE operations	2	PPT
2.9	Relational calculus: Tuple relation	2	PPT
2.10	domain relation calculus,	1	PPT
UNIT - III			
3.1	Secondary storage device: tapes and drives	2	PPT
3.2	optical disk, MO drives	2	Chalk & Talk
3.3	file organization and file structures, operations	1	PPT
3.4	file storage, sequential & direct file organization	2	PPT
3.5	physical storage media and hierarchy	1	Chalk & Talk
3.6	Buffer manager. file organization	2	PPT

3.7	file structures and record types	2	PPT
3.8	Indexing	2	PPT
3.9	Hashing	2	PPT
UNIT - IV			
4.1	Database security: Environment	1	Chalk & Talk
4.2	security risks dimensions and requirements	2	PPT
4.3	data protection, granting and reveling privileges,	1	PPT
4.4	data encryption, integrity, availability	2	PPT
4.5	security practices, network security, auditing	2	PPT
4.6	Transaction: properties	1	PPT
4.7	transaction states, concurrency control	1	Chalk & Talk
4.8	serializability, concurrency control schemes	1	PPT
4.9	transaction management and recovery	1	PPT
4.10	Database backups, causes and failures	1	PPT
4.11	logs recovery and data access	1	PPT
4.12	recovery facilities and techniques,	1	PPT
4.13	multi database systems	1	PPT
UNIT - V			
5.1	Client/server database benefits and costs	2	PPT
5.2	two-tier application architecture	2	PPT
5.3	three-tier application architecture	2	PPT
5.4	homogeneous and heterogeneous databases	2	PPT
5.5	distributed storage advantages, disadvantages	1	PPT
5.6	architecture, two pass mechanism, functions	2	PPT
5.7	Hierarchical, relational and network model	2	PPT
5.8	Object oriented and object relational databases: Need, characteristics, comparison of ODBMS and RDBMS	1	Discussion
5.9	OODBMS and ORDBMS	1	Discussion
Total		75	

Course Designer

Mr. C. Sheik Mydeen

Assistant Professor of Information Technology

Course Code	Course Title	Category	Total Hours	Credits
20PCSC23	Operating Systems and Principles	Core -VII	90	4

Nature of Course	
Knowledge Oriented	✓
Skill Oriented	
Employability Oriented	
Entrepreneurship Oriented	

Course Relevance	
Local	
Regional	
National	
Global	✓

Preamble

Understanding the concepts of discrete mathematics and Learning applications of discrete structures in Computer Science.

Course Outcomes (CO)

On the successful completion of the course the students will be able to

No.	Course Outcome	Knowledge Level
CO1	Analyze the structure of OS and basic architectural involved in OS design	K1,K2,K3
CO2	Evaluate the requirement for process synchronization and scheduling of processes	K1,K2,K3,K4
CO3	Describe the I/O concepts and Deadlock Principles	K1,K2,K3,K4,K5
CO4	Identify use and evaluate the storage management policies with respect to different storage management	K1,K2,K3,K4
CO5	Describe the Files and File system Management	K1,K2,K3,K4

K1-Knowledge K2-Understand K3-Apply K4- Analyse K5- Evaluate

Mapping of CO with PO

	P01	P02	P03	P04	P05
CO1	3	2	3	2	3
CO2	3	3	2	1	3
CO3	2	3	1	3	2
CO4	3	1	3	2	3
CO5	2	3	2	3	2

1-Low

2-Medium

3-Strong

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	2	3	3
CO2	3	2	3	2	3
CO3	2	2	1	1	2
CO4	3	1	3	2	3
CO5	2	3	1	3	2

1-Low

2-Medium

3-Strong

Syllabus

UNIT I

12 Hours

Introduction: History of operating systems - operating system concepts: Processes-Files - The Shell - System calls - Operating system structure: Monolithic Systems-Layered Systems - Virtual Machines - Client Server Model.

UNIT II

22 Hours

Process Management: Introduction To Processes - Inter Process Communication-Classical IPC Problems- Process Scheduling: Round Robin Scheduling - Priority Scheduling - Multiple Queues - Shortest Job First - Guaranteed Scheduling - Lottery Scheduling - Real Time Scheduling - Two level Scheduling - Policy versus Mechanism - Overview of processes in MINIX

UNIT III

24 Hours

Input/Output: Principles of I/O Hardware - Principles of I/O Software - Deadlocks: Resources -Principles of Deadlock -The Ostrich Algorithm-Detection and Recovery-Deadlock Prevention - Deadlock Avoidance - RAM Disks - Disks - Clocks - Terminals.

UNIT IV

18 Hours

Memory Management: Basic Memory Management-Swapping- Virtual Memory: Paging- Page Tables - Translation Lookaside Buffers - Inverted Page Tables - Page Replacement Algorithms - Design Issues For Paging Systems - Segmentation: Implementation of Pure Segmentation - Segmentation with paging: MULTICS - Segmentation with paging: The Intel Premium.

UNIT V

14 Hours

File Systems: Files - Directories: Hierarchical Directory Systems - Path Names - Directory Operations - File System Implementation - Security - Protection Mechanisms: Protection Domains - Access Control Lists - Capabilities - Covert Channels.

Text Books

Andrew S. Tanenbaum, Albert S. Woodhull, *“Operating Systems Design and Implementation”*, Second Edition.

UNIT I: chapter 1.1-1.5 **UNIT II:** chapter 2.1-2.5

UNIT III: chapter 3.1-3.9 **UNIT IV:** chapter 4 **UNIT V:** chapter 5.1-5.4.

Reference Books

William Stallings, *“Operating Systems: Internals and Design Principles”*, 7th Edition, Prentice Hall, 2011.

Pedagogy

Chalk & Talk, E-Resources, Group Discussion

Teaching aids

Black Board, LCD Projector

Course Contents and Lecture Schedule

Module No.	Topic	No. of Lectures	Content Delivery Methods
UNIT - I			
1.1	History of operating systems	2	Discussion
1.2	Processes, Files	1	Chalk & Talk
1.3	The Shell, System calls	1	Chalk & Talk
1.4	Monolithic Systems	2	Lecture
1.5	Layered Systems	2	Chalk & Talk
1.6	Virtual Machines	2	PPT
1.7	Client Server Model.	2	PPT
UNIT - II			
2.1	Introduction To Processes	2	Discussion
2.2	InterProcess Communication	2	PPT
2.3	Classical IPC Problems	2	Chalk & Talk
2.4	Round Robin Scheduling	2	Lecture
2.5	Priority Scheduling	2	Chalk & Talk
2.6	Multiple Queues	1	Chalk & Talk
2.7	Shortest Job First	1	Chalk & Talk
2.8	Guaranteed Scheduling	1	Lecture
2.9	Lottery Scheduling	1	Chalk & Talk
2.10	Real Time Scheduling	2	Lecture
2.11	Two level Scheduling	2	Chalk & Talk
2.12	Policy versus Mechanism	2	PPT
2.13	Overview of processes in MINIX	2	PPT

UNIT - III			
3.1	Principles of I/O Hardware	2	Discussion
3.2	Principles of I/O Software	2	Lecture
3.3	Resources	1	Chalk & Talk
3.4	Principles of Deadlock	2	PPT
3.5	The Ostrich Algorithm	4	Lecture
3.6	Detection and Recovery	2	Chalk & Talk
3.7	Deadlock Prevention	2	Chalk & Talk
3.8	Deadlock Avoidance	2	Lecture
3.9	RAM Disks	1	Chalk & Talk
3.10	Disks	2	Chalk & Talk
3.11	Clocks	2	Chalk & Talk
3.12	Terminals	2	PPT
UNIT - IV			
4.1	Basic Memory Management	1	Lecture
4.2	Swapping	1	Lecture
4.3	Paging	2	Lecture
4.4	Page Tables	2	Chalk & Talk
4.5	Translation Lookaside Buffers	1	PPT
4.6	Inverted Page Tables	1	Chalk & Talk
4.7	Page Replacement Algorithms	2	Chalk & Talk
4.8	Design Issues For Paging Systems	2	Chalk & Talk
4.9	Implementation of Pure Segmentation	2	Chalk & Talk
4.10	Segmentation with paging: MULTICS	2	PPT
4.11	Segmentation with paging: The Intel Premium	2	PPT
UNIT - V			
5.1	Files	1	Lecture
5.2	Hierarchical Directory Systems	2	Chalk & Talk
5.3	Path Names	1	Lecture
5.4	Directory Operations	2	Chalk & Talk
5.5	File System Implementation	2	PPT
5.6	Security	2	Chalk & Talk
5.7	Protection Domains	1	Lecture
5.8	Access Control Lists	1	PPT
5.9	Capabilities	1	Lecture
5.10	Covert Channels	1	PPT
Total		90	

Course Designer

Ms. R. Karthigaichelvi

Assistant Professor of Information Technology

Course Code	Course Title	Category	Total Hours	Credits
20PCSC2P	Advanced Java Programming Lab	Core -VIII	75	4

Nature of Course	
Knowledge Oriented	✓
Skill Oriented	
Employability Oriented	✓
Entrepreneurship Oriented	

Course Relevance	
Local	
Regional	
National	
Global	✓

Preamble

To enable the students to understand the Advanced java Programming will have Java development skills necessary to be an effective team member on medium to large scale projects.

Course Outcomes (CO)

On the successful completion of the course the students will be able to

No.	Course Outcome	Knowledge Level
CO1	Elaborate Java fundamentals Object Oriented Programming (OOP) concepts and AWT Components	K1,K2
CO2	Develop and Implement how to design GUI with Java Swing	K1,K2,K3
CO3	Evaluate how to use and implement the Java Script & JSP.	K1,K2,K3,K4,K5
CO4	Develop and implement server side programs using Socket and Servlets.	K1,K2,K3,K4
CO5	Develop with database connectivity, to familiarize the advanced java programming skills and develop java based web applications.	K1,K2,K3,K4,K5

K1-Knowledge K2-Understand K3-Apply K4- Analyse K5- Evaluate

Mapping of CO with PO

	P01	P02	P03	P04	P05
CO1	3	3	3	3	3
CO2	3	3	2	2	2
CO3	2	3	2	2	3
CO4	2	3	1	3	2
CO5	3	2	1	2	1

1-Low

2-Medium

3-Strong

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	2	2	3
CO2	3	1	3	2	2
CO3	2	1	3	3	1
CO4	3	3	2	1	2
CO5	3	2	1	3	2

1-Low

2-Medium

3-Strong

Syllabus

UNIT I

15 Hours

1. Multithread applications.
2. Implementing packages, access specifies and interfaces
3. Applet program for Animation text, images and sounds

UNIT II

15 Hours

1. Write a Program in Java to implement Calculator using Swing technology.
2. To implement the Layout Managers Concept.
3. To implement the Advanced Swing Concept

UNIT III

15 Hours

1. Program implementing the concept of cookies in JSP
2. To validate the data using Java Script Concept.
3. Create JSP for Login Module.

UNIT IV

15 Hours

1. Socket program for Network Chatting using TCP/IP
2. Socket Programming for Network Chatting using UDP.
3. To implement the Servlet Concept.

UNIT V

15 Hours

1. Client Server application using RMI Techniques
2. JDBC Program using different Statements.
3. To implement the Java Bean Class and Some Attributes

Text Books

Herbert Schildt, "**Java the Complete Reference**", Ninth edition, Tata Mc-GrawHill, 2014.

Cay Horstmann and Grazy Cornell, "**Java: Core Java 2 Vol 1**", Seventh Edition, Sun Microsystems Press.

Reference Book

H.M. Deitel and P.J. Deitel, *"Java How to Program"*, Pearson Prentice Hall
Seventh Edition.

Course Designer

Mr. A. K. JENARTHANAN

Assistant Professor of Information Technology

Course Code	Course Title	Category	Total Hours	Credits
20PCSC2Q	Operating System and Network - Lab	Core -IX	75	4

Nature of Course	
Knowledge Oriented	✓
Skill Oriented	
Employability Oriented	
Entrepreneurship Oriented	

Course Relevance	
Local	
Regional	
National	
Global	✓

Preamble

To provide fundamental concepts of all managements in an operating system by practically.

Course Outcomes (CO)

On the successful completion of the course the students will be able to

No.	Course Outcome	Knowledge Level
CO1	Understand the basic concepts of shell programming	K1,K2,K3
CO2	Understand the concepts of files in shell programming	K1,K2,K3
CO3	Demonstrate the files and directories of shell programming	K1,K2,K3,K4
CO4	Understand and demonstrate the networking concepts	K1,K2,K3,K4,K5
CO5	Evaluate and Demonstrate the scheduling algorithms	K1,K2,K3,K4,K5

K1-Knowledge K2-Understand K3-Apply K4- Analyse K5- Evaluate

Mapping of CO with PO

	P01	P02	P03	P04	P05
CO1	3	3	2	2	3
CO2	3	3	2	3	2
CO3	3	3	3	2	1
CO4	2	3	3	3	1
CO5	3	2	3	2	2

1-Low

2-Medium

3-Strong

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	3
CO2	3	3	2	3	2
CO3	3	3	3	2	1
CO4	2	3	3	3	1
CO5	3	2	3	2	2

1-Low

2-Medium

3-Strong

Syllabus

UNIT I

15 Hours

1. Write a shell script to count number of user's login and print first login user
2. Write a shell script to get your name and greet you depending on time
3. Write a shell script to get three argument from the command line operation 1, operation 2 and the operator and perform arithmetic operations

UNIT II

15 Hours

1. Write a shell script to check the attributes of a file
2. Write a shell script to all files whose size is greater than specific size
3. Write a script that searches for a particular pattern in files & display the name of such files
4. Create a database file and find answer for various queries.

UNIT III

15 Hours

1. Write a shell script that display the calendar for present month, current working directory, the files with the extension as .sh
2. Write a script that checks if the content of two files is same. If so, delete the second file
3. Write a shell script that counts the number of blank lines in a file, count how many lines have a text 'new'
4. Write a shell script that copies files in a directory and its subdirectory to another directory
5. Write a shell script that changes the text color

UNIT IV

15 Hours

1. Design TCP Client and Server application to transfer file
2. Design TCP iterative Client and Server application to reverse the given input sentence
3. Design UDP Client and Server application to reverse the given input sentence.
4. Design UDP Client Server to transfer a file.

5. Design a RPC application to add and subtract a given pair of integers.

UNIT V

15 Hours

1. Write a program using I/O system calls of Unix
2. Write a c program to simulate Unix commands like ls,grep
3. Given a list of processes, their CPU burst times and arrival times, display/print the gantt chart for FCFS and SJF.
4. Given a list of processes, their CPU burst times and arrival times, display/print the gantt chart for Priority and Round Robin techniques
5. Implement some memory management schemes

Text Books

Hans Weber Computer Systems and Networking Guide: ***A Complete Guide to the Basic Concepts in Computer Systems***, Networking, IP Subnetting and Network Security.

Reference Books

S. Sydhani Begum, ***Operating System Lab Programs***.

Course Designer

Mr. A. Peermohamed

Assistant Professor of Information Technology

Course Code	Course Title	Category	Total Hours	Credits
20PCSE21	Data Communications and Networks	Elective -II	75	4

Nature of Course	
Knowledge Oriented	✓
Skill Oriented	
Employability Oriented	
Entrepreneurship Oriented	

Course Relevance	
Local	
Regional	
National	
Global	✓

Preamble

Objective of the computer network is Resource Sharing, high Reliability, increase System Performance and Security.

Course Outcomes (CO)

On the successful completion of the course the students will be able to

No.	Course Outcome	Knowledge Level
CO1	Describe the components and infrastructure that form the basis for most computer networks.	K1,K2,K3
CO2	Detect and correct the errors in the Data Link Layer.	K1,K2,K3,K4
CO3	Implement suitable Routing strategies for a given Network.	K1,K2,K3,K4
CO4	Use suitable Transport/Application Layer Protocol based on application requirements.	K1,K2,K3,K4
CO5	Examine the performance analysis for a network using tools.	K1,K2,K3,K4,K5

K1-Knowledge

K2-Understand

K3-Apply

K4- Analyse

K5- Evaluate

Mapping of CO with PO

	P01	P02	P03	P04	P05
CO1	3	3	2	1	2
CO2	3	3	3	2	2
CO3	2	1	3	3	2
CO4	3	1	3	3	3
CO5	3	2	3	3	3

1-Low

2-Medium

3-Strong

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	3	3
CO2	3	3	1	3	3
CO3	3	3	2	3	3
CO4	3	2	2	3	3
CO5	3	2	2	3	3

1-Low

2-Medium

3-Strong

Syllabus

UNIT I

15 Hours

Introduction: A Brief History – Applications – Computer Networks – Categories of Networks – Standard and Standards Organization – Network Architecture – Open systems and OSI Model – TCP/IP Architecture.

Communication Media and Data Transmission: Fourier Analysis – Analog and Digital Data Transmission – Modulation and Demodulation – Transmission Media – Wireless Communications – Data Transmission Basics – Transmission Mode – Interfacing – Multiplexing.

Data Link Control and Protocol Concepts: Flow Control – Error Control – Asynchronous Protocols – Synchronous Protocol – High level Data Link Control (HDLC)

UNIT II

15 Hours

Local Area Networks: Types of Networks and Topology – LAN Transmission Equipment – LAN Installation and performance.

Ethernet: IEEE Standard 802.3– Fibre Distributed Data Interface (FDDI) .

Distributed Queue Dual Bus (DQDB): IEEE Standard 802.6 – LAN Operating Systems and Protocols – Ethernet Technologies.

Wide Area Networks: WAN Transmission Methods – WAN Carrier Types – WAN Transmission Equipments – WAN Design and Multicast Consideration – WAN Protocols.

UNIT III

15 Hours

Integrated Services and Routing Protocols: Integrating Services – ISDN Topology – ISDN Protocols – Broadband ISDN – Asynchronous Transfer Mode (ATM) – Principal Characteristics of ATM – Frame Relay – Comparison of ISDN, ATM and Frame Relay. **Wireless LANs:** WLAN Applications – Wireless LAN Requirements – Planning for Wireless LANs – Wireless LAN Architecture – IEEE 802.11 Protocol Layer – IEEE 802.11 Physical Layer – Designing the Wireless LAN Layout – WAP Service.

UNIT IV

15 Hours

OSI Internetworking: Principles of Internetworking – Routing Principles – Internetwork Protocols (IP) – Shortcomings of IPv4 – IP Next Generation.

TCP Reliable Transport Service: Transport Protocols – The Service TCP Provides to Applications – End-to-End Service and Datagram – Transmission Control Protocol – User Datagram Protocol.

UNIT V

15 Hours

Network Applications: Client – Server Model – Domain Name System (DNS) – Telnet – File Transfer and Remote File access – Electronic Mail – World Wide Web (WWW).

Network Management: Goal of Network Management – Network Management Standards – Network Management Model – Infrastructure for Network Management – Simple Network Management Protocol(SNMP).

Text Books

Brijendra Singh, ***“Data Communications and Computer Networks”*** 2nd Edition, PHI, 2006

UNIT I: Chapter 1, 2, 5

UNIT II: Chapter 6, 7

UNIT III: Chapter 8, 9

UNIT IV: Chapter 10, 11

UNIT V: Chapter 12, 13

Reference Books

Andrew S. Tanenbaum, ***“Computer Network”***, 4th Ed, PHI, 2006

Prakash. C.Gupat, ***“Data Communications and Computer Networks”***, PHI, 2005.

William Stallings, ***“Data and Computer Communications”*** PHI, 2007.

Behrouz A. Forouzan, ***“Data Communication and Networking”*** TMH, 2005.

Achyut S. Godbole, ***“Data Communications and Networks”***, TMH 2005.

Pedagogy

Chalk & Talk, E-Resources, Group Discussion

Teaching aids

Black Board, LCD Projector

Course Contents and Lecture Schedule

Module No.	Topic	No. of Lectures	Content Delivery Methods
UNIT - I			
1.1	A brief History – Applications – Computer Networks – Categories of networks – Standard and Standards Organization	3	Discussion
1.2	Network Architecture – Open systems and OSI Model – TCP/IP Architecture.	3	Chalk & Talk
1.3	Fourier Analysis – Analog and Digital Data Transmission – Modulation and Demodulation	3	Chalk & Talk
1.4	Transmission Media – Wireless Communications – Data Transmission Basics – Transmission Mode – Interfacing – Multiplexing.	3	PPT
1.5	Flow Control – Error Control – Asynchronous Protocols – Synchronous Protocol – High level Data Link Control (HDLC)	3	Chalk & Talk
UNIT - II			
2.1	Types of Networks and Topology – LAN Transmission Equipment – LAN Installation and performance.	3	Chalk & Talk
2.2	IEEE Standard 802.3– Fibre Distributed Data Interface(FDDI) .	4	PPT
2.3	IEEE Standard 802.6 – LAN Operating Systems and Protocols – Ethernet Technologies	4	Chalk & Talk
2.4	WAN Transmission Methods – WAN Carrier Types – WAN Transmission Equipments – WAN Design and Multicast Consideration – WAN Protocols.	4	PPT
UNIT - III			
3.1	Integrating Services – ISDN Topology – ISDN Protocols – Broadband ISDN	3	Chalk & Talk

3.2	Asynchronous Transfer Mode (ATM) – Principal Characteristics of ATM – Frame Relay – Comparison of ISDN, ATM and Frame Relay.	4	PPT
3.3	WLAN Applications – Wireless LAN Requirements – Planning for Wireless LANs – Wireless LAN Architecture	4	PPT
3.4	IEEE 802.11 Protocol Layer – IEEE 802.11 Physical Layer – Designing the Wireless LAN Layout – WAP Service	4	PPT
UNIT - IV			
4.1	Principles of Internetworking – Routing Principles – Internetwork Protocols (IP)	3	Chalk & Talk
4.2	Shortcomings of IPv4 – IP Next Generation.	4	Chalk & Talk
4.3	Transport Protocols – The Service TCP Provides to Applications	4	PPT
4.4	End-to-End Service and Datagram – Transmission Control Protocol – User Datagram Protocol.	4	PPT
UNIT - V			
5.1	Client – Server Model – Domain Name System (DNS) – Telnet	3	Chalk & Talk
5.2	File Transfer and Remote File access – Electronic Mail – World Wide Web (WWW)	4	PPT
5.3	Goal of Network Management – Network Management Standards – Network Management Model	4	PPT
5.4	Infrastructure for Network Management – (SNMP).	4	PPT
Total		75	

Course Designer

Ms. G. Manonmani

Assistant Professor of Information Technology

Course Code	Course Title	Category	Total Hours	Credits
20PCSE22	Data Mining	Elective -II	75	4

Nature of Course	
Knowledge Oriented	✓
Skill Oriented	
Employability Oriented	
Entrepreneurship Oriented	

Course Relevance	
Local	
Regional	
National	
Global	✓

Preamble

To understand data warehouse concepts, architecture, business analysis and tools, data pre-processing and data visualization techniques, algorithms for finding hidden and interesting patterns in data and apply various classification and clustering techniques using tools.

Course Outcomes (CO)

On the successful completion of the course the students will be able to

No.	Course Outcome	Knowledge Level
CO1	Classify the different data mining techniques; find the recent researches in data mining and supporting technologies.	K1,K2
CO2	Compare the input and output of different data mining algorithms	K1,K2,K3,K4,K5
CO3	Describe Methodological techniques for dealing with missing data	K1,K2
CO4	Apply knowledge on discovery of Association rules in Transaction Databases	K1,K2,K3
CO5	Define the Partitional Clusterings like k-medoids, Modern Clustering Methods like DBSCAN	K1,K2,K3,K4,K5

K1-Knowledge K2-Understand K3-Apply K4- Analyse K5- Evaluate

Mapping of CO with PO

	P01	P02	P03	P04	P05
CO1	1	1	2	1	3
CO2	2	1	1	3	3
CO3	1	2	2	1	1
CO4	1	1	2	3	2
CO5	2	1	2	3	3

1-Low

2-Medium

3-Strong

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	1	2	1	3
CO2	2	1	1	3	3
CO3	1	2	2	1	1
CO4	1	1	2	3	2
CO5	2	1	2	3	3

1-Low

2-Medium

3-Strong

Syllabus

UNIT I

15 Hours

Data mining from a business perspective: Data Mining: Introduction- Data Mining-Success Stories- Main Reason for Growth of Data Mining Research- Recent Research Achievements – Graphical Models and Hierarchical Probabilistic Representations – New Applications - Trends that Effect Data Mining. Data Mining From a Business Perspective: Introduction – From Data Mining Tools to Solutions- Evolution of Data Mining Systems- Knowledge Discovery Process- Data Mining Supporting Technologies Overview- Data Mining Techniques.

UNIT II

15 Hours

Data types of data mining algorithms, decision trees: Data Types, Input and Output of Data Mining Algorithms : Introduction - Instances and Features- Different Types of features- Concepts Learning and Concepts Description- Output of Data Mining – Knowledge Representation. Decision Trees - Classification and Regression Trees: Constructing Classification trees- CHAID –CART- Regression Trees.

UNIT III

15 Hours

Preprocessing and Post processing in data mining: Preprocessing and Post Processing in Data Mining: Introduction- Steps in Preprocessing – Discretization- Feature Extraction, Selection and Construction- Missing Data and Methodological Techniques for Dealing- Examples of Dealing Missing Data in decision Tree Induction.

UNIT IV

15 Hours

Association rule, algorithms for classification and regression: Association Rule Mining: Automatic discovery of Association rules in Transaction Databases - The Apriori Algorithm. Algorithms for Classification and Regression: Naïve Bayes- Multiple Regression Analysis – GMDH- Evolutionary Computing and Genetic Algorithms.

UNIT V

15 Hours

Cluster analysis: Cluster Analysis: Introduction - Partitional Clusterings – k-methods- Modern Clustering Methods- DBSCAN- Optics- Clustering Based on Graph Partitioning- CHAMELEON- The COBWEB Conceptual Clustering Algorithm- GCLUTO-Graphical Clustering Toolkit.

Text Books

K. P. Soman, Shyam Diwakar, V .Ajay *“Insight into Data Mining THEORY AND PRACTICE”*, Prentice – Hall of India Private Limited, New Delhi – 2008.

Reference Books

Jiawei Han and Micheline Kamber, *“Data Mining Concepts and Techniques”*, Third Edition, Elsevier, 2012.

Alex Berson and Stephen J. Smith, *“Data Warehousing, Data Mining & OLAP”*, Tata McGraw – Hill Edition, 35th Reprint 2016.

Ian H. Witten and Eibe Frank, Elsevier, *“Data Mining: Practical Machine Learning Tools and Techniques”*, Second Edition.

Pedagogy

Chalk & Talk, E-Resources, Group Discussion

Teaching aids

Black Board, LCD Projector

Course Contents and Lecture Schedule

Module No.	Topic	No. of Lectures	Content Delivery Methods
UNIT - I			
1.1	Introduction	1	Discussion
1.2	Data mining – success stories	1	Chalk & Talk
1.3	Main reason for growth of data mining research	1	Chalk & Talk
1.4	Recent research achievements	1	PPT
1.5	New applications	1	Chalk & Talk
1.6	Trends that effect data mining	1	Chalk & Talk
1.7	Research challenges	1	Chalk & Talk
1.8	Introduction	1	Chalk & Talk
1.9	From data mining tools to solutions	2	Chalk & Talk
1.10	Evolution of data mining systems	1	Chalk & Talk
1.11	Knowledge discovery process	1	PPT

1.12	Data mining supporting technologies overview	1	Chalk & Talk
1.13	Data mining techniques	2	Chalk & Talk
UNIT - II			
2.1	Introduction	1	Chalk & Talk
2.2	Instances and features	1	Chalk & Talk
2.3	Different types of features	1	Chalk & Talk
2.4	Concept learning and concept description	2	PPT
2.5	Output of data mining – Knowledge representation	1	Chalk & Talk
2.6	Introduction	1	Chalk & Talk
2.7	Constructing classification trees	2	Chalk & Talk
2.8	CHAID	2	PPT
2.9	CART	2	PPT
2.10	Regression trees	2	Chalk & Talk
UNIT - III			
3.1	Introduction	1	Chalk & Talk
3.2	Steps in preprocessing	2	Chalk & Talk
3.3	Discretization	3	Chalk & Talk
3.4	Feature extraction, selection and construction	3	Chalk & Talk
3.5	Missing data and methodological techniques for dealing it	3	PPT
3.6	Example of dealing missing data in decision tree induction	3	Chalk & Talk
UNIT - IV			
4.1	Automatic discovery of association rules in	1	Chalk & Talk
4.2	transaction databases	1	Chalk & Talk
4.3	The Apriori algorithm	2	PPT
4.4	Naive bayes	3	Chalk & Talk
4.5	Multiple regression analysis	3	PPT
4.6	GMDH	3	Chalk & Talk
4.7	Evolutionary computing and genetic algorithms	2	Chalk & Talk
UNIT - V			
5.1	Introduction	1	Chalk & Talk
5.2	Partitional clusterings	1	Chalk & Talk
5.3	k- medoids	1	Chalk & Talk

5.4	Modern clustering methods	1	Chalk & Talk
5.5	DBSCAN	2	PPT
5.6	OPTICS	2	Chalk & Talk
5.7	Clustering based on graph partitioning	1	PPT
5.8	CHAMELEON	2	Chalk & Talk
5.9	The COBWEB conceptual clustering algorithm	2	Chalk & Talk
5.10	GCLUTO	2	Chalk & Talk
Total		75	

Course Designer

Mr. K. Iscaq Faizal

Assistant Professor of Information Technology

Course Code	Course Title	Category	Total Hours	Credits
20PCSC31	Mobile Computing	Core -X	90	4

Nature of Course	
Knowledge Oriented	✓
Skill Oriented	
Employability Oriented	✓
Entrepreneurship Oriented	

Course Relevance	
Local	
Regional	
National	
Global	✓

Preamble

Objective of the Mobile Computing to understand how to work with various Mobile application development framework.

Course Outcomes (CO)

On the successful completion of the course the students will be able to

No.	Course Outcome	Knowledge Level
CO1	Describe the basics Concepts and Architecture of Mobile Computing.	K1,K2
CO2	Understand the Emerging Technologies of Bluetooth, WIMAX and WAP.	K1,K2,K3,K4
CO3	Analyze the Network Multimedia Application Security Issues in Mobile Computing.	K1,K2,K3,K4
CO4	Understanding JAVA SE and the DALVIK virtual machine and Apply the Android Application Resources.	K1,K2,K3
CO5	Apply common UI elements and Evaluate Menus in Android.	K1,K2,K3,K4,K5

K1-Knowledge

K2-Understand

K3-Apply

K4- Analyse

K5- Evaluate

Mapping of CO with PO

	P01	P02	P03	P04	P05
CO1	3	2	2	2	2
CO2	3	3	2	3	3
CO3	3	2	3	3	3
CO4	3	3	3	3	3
CO5	3	2	3	3	3

1-Low

2-Medium

3-Strong

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	3	3
CO2	3	3	2	3	3
CO3	3	3	2	3	3
CO4	3	3	2	3	3
CO5	3	3	2	3	3

1-Low

2-Medium

3-Strong

Syllabus

UNIT I

18 Hours

Mobile Computing – Developing mobile computing Applications – Security in Mobile Computing – Architecture for Mobile Computing – Three tier Architecture – Mobile computing through internet – Satellite Communication Systems.

UNIT II

18 Hours

Emerging Technologies – Introduction – Bluetooth – Wireless broadband (WIMAX) – Mobile IP – Wireless Application Protocol: Introduction – WAP – WAP Applications, Environment, User Agent – MMS.

UNIT III

18 Hours

Multimedia: Introduction – Compression and Decompression – Coder and Decoder – Popular Compression Techniques – Network Multimedia Application – Security Issues in Mobile Computing: Introduction-Information Security – Security Techniques and Algorithms – Security Protocols – Security Models.

UNIT IV

18 Hours

Introducing the Android Software development platform – Understanding JAVA SE and the DALVIK virtual machine – Leveraging Android XML Using ur Android Application Resources - Launching ur Applications – Screen layout design – Views and layouts – Android view Hierarchies – Defining Screen layout : Using XML.

UNIT V

18 Hours

UI Design: Buttons, Menus and dialogue – Using common UI elements – Using Menus in Android – Adding dialogs.

Text Books

Asoke K. Talukder and Roopa R Yavagal (2005), ***“Mobile Computing Technology”***, Applications and service creation, Tata McGraw – Hill Publishing Company Limited.

UNIT I – Chapter 1.3, 1.8, 1.9, 2.4, 2.5, 2.7, 3.3

UNIT II – Chapter 4.1, 4.2, 4.4, 4.5, 8.1, 8.2, 8.3

UNIT III – Chapter 18.1-18.6, 20.1-20.4, 20.7

Walloce– Jackson, ***“Android Apps for Absolute Beginner’s A pre”***, 2012 Edition

UNIT IV – Chapter 4

UNIT V – Chapter 7

Reference Books

T. Mikonen, ***“Programming Mobile devices: An Introduction for Parctitioner’s”***, Willey 2007.

Hashimi, S. Komatineni, D. Maclean , ***“Pro Android”***, A press 2010.

Pedagogy

Chalk & Talk, E-Resources, Group Discussion

Teaching aids

Black Board, LCD Projector

Course Contents and Lecture Schedule

Module No.	Topic	No. of Lectures	Content Delivery Methods
UNIT - I			
1.1	Mobile Computing – Developing mobile computing Applications.	3	Chalk & Talk
1.2	Security in Mobile Computing.	3	PPT
1.3	Architecture for Mobile Computing.	3	PPT
1.4	Three tier Architecture.	3	Chalk & Talk
1.5	Mobile computing through internet.	3	PPT
1.6	Satellite Communication Systems.	3	PPT
UNIT - II			
2.1	Emerging Technologies.	3	Discussion
2.2	Introduction: Bluetooth.	3	Chalk & Talk
2.3	Wireless broadband (WIMAX)-Mobile IP.	3	PPT
2.4	Wireless Application Protocol.	3	PPT
2.5	Introduction: WAP – WAP Applications.	3	Chalk & Talk

2.6	Environment, User Agent – MMS.	3	PPT
UNIT - III			
3.1	Multimedia: Introduction – Compression and Decompression.	3	Chalk & Talk
3.2	Coder and Decoder – Popular Compression Techniques.	3	PPT
3.3	Network Multimedia Application.	3	PPT
3.4	Security Issues in Mobile Computing : Introduction	3	Chalk & Talk
3.5	Information Security – Security Techniques and Algorithms.	3	PPT
3.6	Security Protocols – Security Models.	3	PPT
UNIT - IV			
4.1	Introducing the Android Software development platform.	3	Chalk & Talk
4.2	Understanding JAVA SE and the DALVIK virtual machine.	3	PPT
4.3	Leveraging Android XML Using ur Android Application Resources.	4	Chalk & Talk
4.4	Launching ur Applications – Screen layout design – Views and layouts.	4	PPT
4.5	Android view Hierarchies – Defining Screen layout: Using XML.	4	PPT
UNIT - V			
5.1	UI Design: Buttons, Menus and dialogue.	4	PPT
5.2	Using common UI elements.	4	PPT
5.3	Using Menus in Android.	5	PPT
5.4	Adding dialogs.	5	PPT
Total		90	

Course Designer

Ms. G. Manonmani

Assistant Professor of Information Technology

Course Code	Course Title	Category	Total Hours	Credits
20PCSC32	Compiler Design	Core -XI	90	4

Nature of Course	
Knowledge Oriented	✓
Skill Oriented	
Employability Oriented	
Entrepreneurship Oriented	

Course Relevance	
Local	
Regional	
National	
Global	✓

Preamble

Design a compiler for a concise programming language.

Course Outcomes (CO)

On the successful completion of the course the students will be able to

No.	Course Outcome	Knowledge Level
CO1	Learn the various phases of compiler.	K1,K2,K3
CO2	Learn the various parsing techniques.	K1,K2,K3,K4
CO3	Understand intermediate code generation.	K1,K2,K3,K4
CO4	Learn to implement front-end of the compiler.	K1,K2,K3,K4,K5
CO5	Learn to implement code generator.	K1,K2,K3,K4

K1-Knowledge K2-Understand K3-Apply K4- Analyse K5- Evaluate

Mapping of CO with PO

	P01	P02	P03	P04	P05
CO1	3	1	2	3	3
CO2	2	1	3	2	3
CO3	2	2	3	3	3
CO4	3	3	3	3	2
CO5	1	3	2	2	3

1-Low

2-Medium

3-Strong

Mapping of CO with PS0

	PS01	PS02	PS03	PS04	PS05
CO1	3	1	2	3	3
CO2	2	1	3	2	3
CO3	2	2	3	3	3
CO4	3	3	3	3	2
CO5	1	3	2	2	3

1-Low

2-Medium

3-Strong

Syllabus

UNIT I

18 Hours

Compilers And Translators-Why Do We Need Translators? - The Structure Of A Compiler - Lexical Analysis-Syntax Analysis-Intermediate Code Generation-Optimization-Code Generation-Book Keeping-Error Handling-Compiler-Writing Tools-Getting started. The role of the lexical analyzer-Simple approach to design of a lexical analyser - Regular Expressions-Finite Automata-From regular expression to finite automata-Minimizing the number of states of a DFA-A language for specifying lexical analyzer-Implementing a lexical analyzer- The scanner generator as Swiss army Knife.

UNIT II

18 Hours

The Syntactic Specification of Programming Languages-Derivation and Parse Trees- Capability of context free Grammars. Parsers-Shift-reduce Parsing-Operator-precedence parsing - Top - down parsing-Predictive Parsers.

UNIT III

18 Hours

LR parsers-The canonical collection of LR(0) items-constructing SLR parsing tables - constructing canonical LR parsing tables-constructing SLR parsing tables-constructing LALR parsing tables - Using Ambiguous grammars- An automatic parse generator Implementation of LR parsing Tables - constructing LALR set of items. Syntax directed translation schemes - Implementation if syntax directed schemes-Intermediate Code- Parse Tree and Syntax Trees -Three Address code, quadruples, and triples- Translation of assignment statements-Boolean. Expression-Statements that alter the flow of control-postfix translations-Translation with a top-down parser.

UNIT IV

18 Hours

The contents of a symbol tables-Data structure for a symbol table-Representing Scope information. Errors-Lexical-phase errors - syntactic-phase errors-Semantic errors. The principal sources of optimization-Loop optimization -The DAG representation of basic blocks-Value numbers and algebraic laws-Global data-flow analysis.

UNIT V

18 Hours

Dominators-Reducible Flow graphs -Depth-first search-Loop-invariant computations - Induction variable elimination-Some other loop optimization. Code Generation-Object Programs- A machine Model- A simple code generator-Register allocation and assignment - Code generation from DAG's-Peepphole Optimization.

Text Books

Alfred V.Aho and Jeffrey D.Ullman, "*Principles of Compiler Design*", 25th Reprint, 2002.

UNIT I: Chapter 1, 3

UNIT II: Chapter 4, 5

UNIT III: Chapter 6, 7

UNIT IV: Chapter 9, 11, 12

UNIT V: Chapter 13, 15

Reference Books

Allen I. Holub, "*Compiler Design in C*", Prentice Hall of India, 2003.

C. N. Fischer and R. J. LeBlanc, "*Crafting a compiler with C*", Benjamin Cummings, 2003.

J.P. Bennet, "*Introduction to Compiler Techniques*", Second Edition, Tata McGraw Hill, 2003.

Pedagogy

Chalk & Talk, E-Resources, Group Discussion

Teaching aids

Black Board, LCD Projector

Course Contents and Lecture Schedule

Module No.	Topic	No. of Lectures	Content Delivery Methods
UNIT - I			
1.1	Compilers And Translators-Why Do We Need Translators?	2	Chalk & Talk
1.2	The Structure Of A Compiler	2	Chalk & Talk
1.3	Lexical Analysis-Syntax Analysis	2	Discussion
1.4	Intermediate Code Generation-Optimization-Code Generation	2	Chalk & Talk
1.5	Book Keeping-Error Handling-Compiler-Writing Tools-Getting started.	2	Chalk & Talk
1.6	The role of the lexical analyzer-Simple approach to design of a lexical analyzer	2	Chalk & Talk
1.7	Regular Expressions-Finite Automata-From regular expression to finite automata	2	Chalk & Talk
1.8	Minimizing the number of states of a DFA-A language for specifying lexical analyzer	2	Chalk & Talk
1.9	Implementing a lexical analyzer- The scanner generator as Swiss army Knife.	2	Chalk & Talk

UNIT - II			
2.1	The Syntactic Specification of Programming Languages	2	Discussion
2.2	Derivation and Parse Trees	2	Chalk & Talk
2.3	Capability of context free Grammars	2	Chalk & Talk
2.4	Parsers-Shift-reduce Parsing	3	Chalk & Talk
2.5	Operator-precedence parsing	3	Chalk & Talk
2.6	Top-down parsing	3	Chalk & Talk
2.7	Predictive Parsers	3	Chalk & Talk
UNIT - III			
3.1	LR parsers-The canonical collection of LR(0) items-constructing SLR parsing tables	2	PPT
3.2	constructing canonical LR parsing tables-constructing SLR parsing tables-constructing LALR parsing tables	2	Chalk & Talk
3.3	Using Ambiguous grammars- An automatic parse generator Implementation of LR parsing Tables	2	Discussion
3.4	Constructing LALR set of items. Syntax directed translation schemes	2	PPT
3.5	Implementation if syntax directed schemes-Intermediate Code-Parse Tree and Syntax Trees	2	Chalk & Talk
3.6	Three Address code, quadruples, and triples	2	Chalk & Talk
3.7	Translation of assignment statements-Boolean Expression	2	Chalk & Talk
3.8	Statements that alter the flow of control-postfix translations	2	Chalk & Talk
3.9	Translation with a top-down parser.	2	Chalk & Talk
UNIT - IV			
4.1	The contents of a symbol tables-Data structure for a symbol table-Representing Scope information	3	Chalk & Talk
4.2	Errors-Lexical-phase errors – syntactic-phase errors-Semantic errors.	3	Chalk & Talk
4.3	The principal sources of optimization-Loop optimization	3	Chalk & Talk

4.4	The DAG representation of basic blocks	3	PPT
4.5	Value numbers and algebraic laws	3	PPT
4.6	Global data-flow analysis.	3	Chalk & Talk
UNIT - V			
5.1	Dominators-Reducible Flow graphs	2	Chalk & Talk
5.2	Depth-first search-Loop-invariant computations	2	Chalk & Talk
5.3	Induction variable elimination-Some other loop optimization	2	Discussion
5.4	Code Generation-Object Programs	2	Chalk & Talk
5.5	A machine Model- A simple code generator	3	Chalk & Talk
5.6	Register allocation and assignment	3	PPT
5.7	Code generation from DAG's	3	Chalk & Talk
5.8	Peephole Optimization	1	Chalk & Talk
Total		90	

Course Designer

Ms. R. Karthigaichelvi

Assistant Professor of Information Technology

Course Code	Course Title	Category	Total Hours	Credits
20PCSC3P	Open Source Technologies - Lab	Core -XII	75	4

Nature of Course	
Knowledge Oriented	✓
Skill Oriented	✓
Employability Oriented	✓
Entrepreneurship Oriented	

Course Relevance	
Local	
Regional	
National	
Global	✓

Preamble

To understand an open source scripting Language for web application development which then can be embedded into HTML and Java Script etc., Open Sourcing includes technological advertisement, innovation, modification, adoption and redistribution of website design model.

Course Outcomes (CO)

On the successful completion of the course the students will be able to

No.	Course Outcome	Knowledge Level
CO1	Independently design and develop computer software systems and products based on sound theoretical principles and appropriate software development skills.	K1,K2,K3,K4
CO2	Demonstrate knowledge of technological advances through active participation in life-long	K1,K2,K3,K4,K5
CO3	Accept to take up responsibilities upon employment in the areas of teaching, research, and software development.	K1,K2,K3,K4,K5
CO4	Exhibit technical communication, collaboration and mentoring skills	K1,K2,K3,K4,K5
CO5	Assume roles both as team members and as team leaders in an organization.	K1,K2,K3,K4,K5

K1-Knowledge

K2-Understand

K3-Apply

K4- Analyse

K5- Evaluate

Mapping of CO with PO

	P01	P02	P03	P04	P05
CO1	3	3	3	3	2
CO2	3	3	2	2	2
CO3	3	2	2	2	2
CO4	3	3	3	2	1
CO5	3	2	2	1	1

1-Low

2-Medium

3-Strong

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	2
CO3	3	3	3	3	2
CO4	3	3	3	2	1
CO5	3	3	2	2	1

1-Low

2-Medium

3-Strong

Syllabus

UNIT I

15 Hours

1. Write a Program to Containing Colors and Color Codes Generated by Mixing PHP with HTML.
2. Building the Program to Convert Rupees to Dollar's Value Converter Using PHP.
3. To Testing the Odd And Even Numbers Using PHP.

UNIT II

15 Hours

1. Write the Program in PHP to Processing a Member Registration Form.
2. Write a PHP script to find the Value in an Array.
 - a) Removing Duplicate
 - b) Randomizing Reversing Arrays
 - c) Searching Arrays
 - d) Sorting Arrays
 - e) Merging Arrays
 - f) Comparing Arrays
3. Create a Web Form for the User to enter his or her Date of Birth to find the age.

UNIT III

15 Hours

1. Write a PHP Script to Perform the Calculator Functions using user Defined Functions and Form Inputs.
2. Write a Program to Encrypt the Plain Text Using PHP.
3. Construct the Web form to Configure Reading and Writing Files using PHP.

UNIT IV

15 Hours

1. To Create the Photo Gallery in PHP.
2. Adding a Employees to a Database and Display Employee list Using PHP and MySQL.
3. To Create Personal to do List using PHP.

UNIT V

15 Hours

1. Build a Login Form in PHP using MySQL.
2. Reading and Writing XML Configuration Files in PHP.
3. Write a Program to Tracking Previous Visit to a Page.
4. Design a web Form for Place on Order Validating Input using PHP

Text Books

D. K. Prathikar, *Soft Computing*, Narosa Publishing House, New Delhi, 2008.

Reference Books

<https://ldrp.ac.in/images/syllabus/BEComputer/8023%20soft%20computing.pdf>

[http://itmgoi.in/download/CSE%20&%20IT/Soft%20Computing%20IT%20\(IT-802\).pdf](http://itmgoi.in/download/CSE%20&%20IT/Soft%20Computing%20IT%20(IT-802).pdf)

<http://mirlab.org/jang/book/>

SOFTWARE: Python / CPP / JAVA

Course Designer

Mr. A. Peermohamed

Assistant Professor of Information Technology

Course Code	Course Title	Category	Total Hours	Credits
20PCSC3Q	Mobile Application Development- Lab	Core -XIII	75	4

Nature of Course	
Knowledge Oriented	✓
Skill Oriented	✓
Employability Oriented	✓
Entrepreneurship Oriented	

Course Relevance	
Local	
Regional	
National	
Global	✓

Preamble

To understand how to work with various mobile application development framework.

Course Outcomes (CO)

On the successful completion of the course the students will be able to

No.	Course Outcome	Knowledge Level
CO1	Develop an activity in android environment, compare & evaluate the different activities.	K1,K2,K3,K4,K5
CO2	Create calculator with basic arithmetic operations, add the scroll view to the display window.	K1,K2,K3,K4,K5
CO3	Create menus, set and reset the count-down timer, make use of list view in android environment.	K1,K2,K3,K4,K5
CO4	Develop simple to do list & create multiple activities, able to use radio group functionality in android environment.	K1,K2,K3,K4,K5
CO5	Create alerts, develop animation, make use of action button	K1,K2,K3,K4,K5

K1-Knowledge K2-Understand K3-Apply K4- Analyse K5- Evaluate

Mapping of CO with PO

	P01	P02	P03	P04	P05
CO1	3	2	3	2	3
CO2	2	3	2	3	2
CO3	3	2	1	2	1
CO4	1	3	2	3	2
CO5	2	1	3	1	3

1-Low

2-Medium

3-Strong

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	3	3
CO2	3	3	3	3	3
CO3	1	3	3	3	2
CO4	2	3	3	3	3
CO5	3	2	3	2	1

1-Low

2-Medium

3-Strong

Syllabus

UNIT I

15 Hours

1. To create a java android to build a simple android application.
2. To create a java android program to demonstrate activity life cycle.
3. To create a java android to change the background of your activity.

UNIT II

15 Hours

1. To create a java android to perform all operations using calculators.
2. To create a java android to change the image displayed on the screen.
3. To create a java android to demonstrate the use of scroll view.

UNIT III

15 Hours

1. To create a java android to demonstrate the menu application.
2. To create a java android to demonstrate list view activity.
3. To create a java android to demonstrate the countdown timer application.

UNIT IV

15 Hours

1. To create a java android to demonstrate a simple to do list application
2. To create a java android to demonstrate radio group application.
3. To create a java android to create multiple activities within an application.

UNIT V

15 Hours

1. To create a java android to animate bitmap.
2. Java Android Program to Demonstrate Action Button by Implementing on Click Listener
3. Java Android Program to Demonstrate Alert Dialog Box.

Text Books

Michael burton. *Android App development for dummies*, A wiley Brand, 3rd Edition,

Course Designer

Mr. A. Peermohamed

Assistant Professor of Information Technology

Course Code	Course Title	Category	Total Hours	Credits
20PCSE31	Cloud Computing	Elective -III	75	4

Nature of Course	
Knowledge Oriented	
Skill Oriented	
Employability Oriented	✓
Entrepreneurship Oriented	

Course Relevance	
Local	
Regional	
National	
Global	✓

Preamble

This course covers a series of current cloud computing technologies, including technologies for Infrastructure as a Service, Platform as a Service, Software as a Service, and Physical Systems as a Service.

Course Outcomes (CO)

On the successful completion of the course the students will be able to

No.	Course Outcome	Knowledge Level
CO1	Identify the working of cloud computing concepts & develop the cloud computing environments	K1,K2
CO2	Define the principles of parallel and distributed computing , work with remote procedure call & distributed computing technologies	K1,K2
CO3	Describe the architecture of cloud, economics of the cloud	K1,K2
CO4	Describe the Paas, Iaas cloud services &work with it	K1,K2,K3,K4
CO5	Apply the monitoring & management in the cloud environments, impacts of SLA in using cloud services	K1,K2,K3,K4,K5

K1-Knowledge K2-Understand K3-Apply K4- Analyse K5- Evaluate

Mapping of CO with PO

	P01	P02	P03	P04	P05
CO1	2	1	2	3	3
CO2	1	3	2	2	3
CO3	2	3	2	3	2
CO4	3	2	2	3	3
CO5	1	3	2	3	3

1-Low

2-Medium

3-Strong

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	1	2	3	3
CO2	1	3	2	2	3
CO3	2	3	2	3	2
CO4	3	2	2	3	3
CO5	1	3	2	3	3

1-Low

2-Medium

3-Strong

Syllabus

UNIT I

15 Hours

Principles of Parallel and Distributed Computing: Eras of Computing - Parallel vs. Distributed Computing - Elements of Parallel Computing - What is Parallel Processing?- Hardware Architectures for Parallel Processing - Approaches to Parallel Programming - Levels of Parallelism - Laws of Caution - Elements of Distributed Computing - General Concepts and Definitions - Components of a Distributed System - Architectural Styles for Distributed Computing - Technologies for Distributed Computing - Remote Procedure Call - Distributed Object Frameworks - Service Oriented Computing.

UNIT II

15 Hours

Introduction - Cloud Computing at a Glance -The Vision of Cloud Computing - Defining a Cloud - A Closer Look - Cloud Computing Reference Model - Characteristics and Benefits - Challenges Ahead - Historical Developments - Distributed Systems - Virtualization - Web 2.0 -Service-Oriented Computing - Utility-Oriented Computing - Building Cloud Computing Environments- Application Development - Infrastructure and System Development.

UNIT III

15 Hours

Cloud Computing Architecture: Introduction - Cloud Reference Model – Architecture Infrastructure / Hardware as a Service - Platform as a Service - Software as a Service - Types of Clouds - Public Clouds - Private Clouds - Hybrid Clouds - Community Clouds - Economics of the Cloud - Open Challenge - Cloud Definition Cloud Interoperability and Standards - Scalability and Fault Tolerance – Contents - Security, Trust, and Privacy - Organizational Aspects.

UNIT IV

15 Hours

Infrastructure as a Service: Virtual Machines provisioning and Migration Services – Virtual Machine Provisioning and manageability – Virtual Machine Migration Services -Secure Distributed Data Storage in Cloud Computing – Cloud Storage from LANs to WANs - Technologies for Data Security in cloud Computing. **Platform and Software as a Service:** Dynamic ICT services – Importance of quality and Security in clouds – Dynamic Data center – Producing Business-ready, Dynamic ICT Services.

UNIT V

15 Hours

Monitoring and Management: An Architecture for Federated Cloud Computing - Introduction- A Typical Use Case – The Basic Principles of Cloud Computing – A Model for Federated Cloud Computing. **SLA Management in Cloud Computing:** Traditional Approaches to SLO Management - Types of SLA – Life Cycle of SLA. **Governance and Case Studies:** Data Security in the Cloud – The current state of data security in the cloud – Cloud Computing and Data Security Risk.

Text Books

RajkumarBuyya, Christian Vecchiola, S. ThamaraiSelvi, “**Mastering Cloud Computing**”, McGraw Hill Education (India) Private Limited Publications, First Reprint, 2013.

RajkumarBuyya, James Broberg and AndrzejGoscinski, “**Cloud Computing Principles and Paradigms**”, Wiley Publications, 2013.

Reference Books

Michael Miller, “**Cloud Computing Web Based Applications that change the way youwork and collaborate online**”, Pearson Education, 2009.

Pedagogy

Chalk & Talk, E-Resources, Group Discussion

Teaching aids

Black Board, LCD Projector, Charts and Mind Maps

Course Contents and Lecture Schedule

Module No.	Topic	No. of Lectures	Content Delivery Methods
UNIT - I			
1.1	Eras of Computing	2	Chalk & Talk
1.2	Parallel vs. Distributed Computing	2	Chalk & Talk
1.3	Hardware Architectures for Parallel Processing	2	Discussion
1.4	Elements of Distributed Computing	3	Chalk & Talk
1.5	Architectural Styles for Distributed Computing	3	PPT
1.6	Remote Procedure Call	3	Chalk & Talk
UNIT - II			
2.1	Defining a Cloud	1	Discussion
2.2	Cloud Computing Reference Model	3	PPT
2.3	Distributed Systems	3	Chalk & Talk
2.4	Virtualization	2	Chalk & Talk
2.5	Service-Oriented Computing	3	Chalk & Talk
2.6	Utility-Oriented Computing	1	Chalk & Talk
2.7	Infrastructure and System Development	2	PPT
UNIT - III			
3.1	Cloud Reference Model	2	Discussion
3.2	Architecture Infrastructure / Hardware as a Service	2	Chalk & Talk
3.3	Platform as a Service	1	Chalk & Talk
3.4	Software as a Service	2	Chalk & Talk
3.5	Types of Clouds	3	PPT
3.6	Economics of the Cloud	2	Chalk & Talk
3.7	Scalability and Fault Tolerance	3	Chalk & Talk
UNIT - IV			
4.1	Virtual Machine Provisioning and manageability	3	Chalk & Talk
4.2	Virtual Machine Migration Services	2	Discussion
4.3	Cloud Storage from LANs to WANs	3	PPT
4.4	Technologies for Data Security in cloud Computing	2	Chalk & Talk
4.5	Dynamic ICT services	2	PPT
4.6	Importance of quality and Security in clouds	3	Chalk & Talk

UNIT - V			
5.1	An Architecture for Federated Cloud Computing	2	PPT
5.2	The Basic Principles of Cloud Computing	2	Chalk & Talk
5.3	Traditional Approaches to SLO Management	3	Discussion
5.4	Types of SLA	3	Chalk & Talk
5.5	Life Cycle of SLA	1	Discussion
5.6	Data Security in the Cloud	2	PPT
5.7	Cloud Computing and Data Security Risk	2	Chalk & Talk
Total		75	

Course Designer

Mr. K. Iscaq Faizal

Assistant Professor of Information Technology

Course Code	Course Title	Category	Total Hours	Credits
20PCSE32	Big Data Analytics	Elective -III	75	4

Nature of Course	
Knowledge Oriented	✓
Skill Oriented	✓
Employability Oriented	
Entrepreneurship Oriented	

Course Relevance	
Local	
Regional	
National	
Global	✓

Preamble

This course covers foundational techniques and tools required for data science and big data analytics. The course focuses on concepts, principles, and techniques applicable to any technology environment and industry and establishes a baseline that can be enhanced by further formal training and additional real-world experience.

Course Outcomes (CO)

On the successful completion of the course the students will be able to

No.	Course Outcome	Knowledge Level
CO1	Differentiate traditional data processing with Big Data Analytics.	K1
CO2	Explain the technology landscape behind the Big Data Analytics using Hadoop and NoSQL.	K1,K2,K3
CO3	Solve distributed computing challenges with the help of Hadoop and MongoDB.	K1,K2,K3,K4
CO4	Perform CRUD operations using Cassandra and Hive.	K1,K2,K3,K4
CO5	Differentiate between Pig and Hive in terms of processing and to design JasperReports using Jaspersoft studio using data from NoSQL databases.	K1,K2,K3,K4,K5

K1-Knowledge K2-Understand K3-Apply K4- Analyse K5- Evaluate

Mapping of CO with PO

	P01	P02	P03	P04	P05
CO1	3	3	1	3	3
CO2	2	3	1	2	3
CO3	3	2	2	1	3
CO4	2	3	3	3	1
CO5	3	1	2	3	3

1-Low

2-Medium

3-Strong

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	1	2
CO2	3	3	1	3	3
CO3	2	1	2	3	1
CO4	2	3	1	2	2
CO5	3	1	2	3	1

1-Low

2-Medium

3-Strong

Syllabus

UNIT I

12 Hours

Grasping Fundamentals of Big Data: The Evolution of Data Management – Understanding the waves of Managing Data – Defining Big Data – Building a Successful Big Data Management Architecture – Examining Big Data Types : Defining Structured Data – putting big data together.

UNIT II

15 Hours

Operational databases – RDBMSs are important in a big data environment – Non relational data bases – Key-value pair databases – Document databases – Columnar databases – Graph databases –Spatial databases – Map reduce fundamentals – Tracing the origins of map reduce – Understanding the map function – Adding the reduce function – putting map and reduce together – Optimizing map reduce tasks.

UNIT III

16 Hours

Exploring the world of Hadoop – Explaining Hadoop – Understanding HDFS – Hadoop map reduce – The Hadoop foundation and eco system – Building a big data foundation with the Hadoop eco system - Managing resources and applications with Hadoop YARN – Storing big data with HBASE – Mining big data with Hive – Interacting with the Hadoop eco system.

UNIT IV

16 Hours

Defining big data analytics – Using big data to get results – Modifying Business Intelligence products to handle big data – Exploring unstructured data – Understanding Text Analytics – Analysis and Extraction techniques – Text Analytics tools for big data.

UNIT V

16 Hours

Integrating data sources – Identifying the data you need – Understanding the fundamentals of big data integration – Defining traditional ETL – Understanding ETL – Using Hadoop as ETL – Using Streaming data – Using Complex Event Processing – Differentiating CEP from streams

Text Books

Judith Hurwitz, Alan Nugent, Dr. Fern Halper, Marcia Kaufman, “**Big Data for Dummies**”, A Wiley Brand.

UNIT I : Chapter 1, 2

UNIT II : Chapter 7, 8

UNIT III : Chapter 9, 10

UNIT IV : Chapter 12, 13

UNIT V : Chapter 15, 16

Reference Books

Bart Baesens, “**Analytics in a Big Data World**”, Kindle Edition, 2014.

Pedagogy

Chalk & Talk, E-Resources, Group Discussion

Teaching aids

Black Board, LCD Projector

Course Contents and Lecture Schedule

Module No.	Topic	No. of Lectures	Content Delivery Methods
UNIT - I			
1.1	The Evolution of Data Management	1	Discussion
1.2	Understanding the waves of Managing Data	1	PPT
1.3	Defining Big Data	1	Chalk & Talk
1.4	Building a Successful Big Data Management Architecture	3	PPT
1.5	Big Data Types : Defining Structured Data	3	PPT
1.6	Putting big data together	3	PPT
UNIT - II			
2.1	Operational databases	1	Discussion
2.2	RDBMSs are important in a big data environment	1	Chalk & Talk
2.3	Non-relational data bases – Key-value pair databases	2	Chalk & Talk
2.4	Document databases	1	PPT
2.5	Columnar databases	1	PPT
2.6	Graph databases	1	PPT
2.7	Spatial databases	1	PPT
2.8	Map reduce fundamentals	1	PPT
2.9	Tracing the origins of map reduce – Understanding the map function	1	PPT
2.10	Adding the reduce function – putting map and reduce together	2	PPT
2.11	Optimizing map reduce tasks	3	PPT

UNIT - III			
3.1	Exploring the world of Hadoop	1	PPT
3.2	Explaining Hadoop – Understanding HDFS	2	PPT
3.3	Hadoop map reduce – The Hadoop foundation and eco system	3	Chalk & Talk
3.4	Building a big data foundation with the Hadoop eco system	3	PPT
3.5	Managing resources and applications with Hadoop YARN	3	PPT
3.6	Storing big data with HBASE	1	PPT
3.7	Mining big data with Hive – Interacting with the Hadoop eco system	3	Discussion
UNIT - IV			
4.1	Defining big data analytics	2	Discussion
4.2	Using big data to get results	1	PPT
4.3	Modifying Business Intelligence products to handle big data	3	PPT
4.4	Exploring unstructured data	2	PPT
4.5	Understanding Text Analytics	2	Chalk & Talk
4.6	Analysis and Extraction techniques	3	PPT
4.7	Text Analytics tools for big data	3	PPT
UNIT - V			
5.1	Integrating data sources – Identifying the data you need	3	PPT
5.2	Understanding the fundamentals of big data integration – Defining traditional ETL	4	Chalk & Talk
5.3	Understanding ETL – Using Hadoop as ETL	3	PPT
5.4	Using Streaming data	1	PPT
5.5	Using Complex Event Processing	2	PPT
5.6	Differentiating CEP from streams	3	PPT
Total		75	

Course Designer

Mr. Z. Abdul Basith

Assistant Professor of Information Technology

Course Code	Course Title	Category	Total Hours	Credits
20PCSC41	Software Engineering	Core -IX	75	4

Nature of Course	
Knowledge Oriented	✓
Skill Oriented	
Employability Oriented	
Entrepreneurship Oriented	

Course Relevance	
Local	
Regional	
National	
Global	✓

Preamble

To knowledge on Software engineering concepts in turn gives a roadmap to design a new software project and maintenance.

Course Outcomes (CO)

On the successful completion of the course the students will be able to

No.	Course Outcome	Knowledge Level
CO1	Plan a software engineering process life cycle , including the specification, design, implementation, and testing of software systems that meet specification, performance, maintenance and quality requirements	K1,K2
CO2	Able to elicit, analyze and specify software requirements through a productive working relationship with various stakeholders of the project	K1,K2,K3
CO3	Know how to develop the code from the design and effectively apply relevant standards and perform testing, and quality management and practice	K1,K2,K3
CO4	Analyze and translate a specification into a design, and then realize that design practically, using an appropriate software engineering methodology.	K1,K2,K3,K4
CO5	Able to use modern engineering tools necessary for software project management, time management and software reuse.	K1,K2,K3,K4,K5

K1-Knowledge

K2-Understand

K3-Apply

K4- Analyse

K5- Evaluate

Mapping of CO with PO

	P01	P02	P03	P04	P05
CO1	2	2	3	1	1
CO2	1	2	3	3	2
CO3	2	3	2	3	2
CO4	2	2	3	3	2
CO5	3	3	2	1	1

1-Low

2-Medium

3-Strong

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	3	2	3	3
CO2	3	3	2	2	3
CO3	2	2	3	3	1
CO4	3	2	3	2	1
CO5	3	3	2	1	1

1-Low

2-Medium

3-Strong

Syllabus

UNIT I

12 Hours

The Evolving Role of Software - Software - The Changing Nature of Software Legacy Software - Software Myths - Prescriptive Models - The Water Fall Model - Incremental Process Models Evolutionary Process Models.

UNIT II

15 Hours

Software Engineering Practice - Communication Practices - Planning Practices - Modeling Practices - Construction Practice. A Bridge to Design and Construction - Requirements Engineering Tasks - Eliciting Requirements - Developing Use - Cases - Building the Analysis Model .Requirements Analysis - Analysis Modeling Approaches - Data Modeling Concepts - Object Oriented Analysis - Scenario - Based Modeling - Flow Oriented Modeling - Class Based Modeling - Creating a behavioral Model.

UNIT III

16 Hours

Design within the Context of Software Engineering – Design Process and Design Quality – Design Concepts – The Design Models – Pattern Based Software Design. Software Architecture – Data Design – Architectural Styles and Patterns – Architectural Design – Assessing Alternative Architectural Design- Mapping Data Flow into a Software Architecture. What is a Component – Designing class based Components- Conducting Component-Level Design – Object Constraint Language – Designing Conventional Components. The Golden Rules – User Interface Analysis and Design – Interfaces Analysis Interface Design steps – Design Evaluation.

UNIT IV

16 Hours

A Strategic Approach to Software Testing – Strategic Issues – Test Strategies Conventional Software – Test Strategies for Object Oriented Software – Validation Testing – System Testing – The Art of Debugging. Software Testing Fundamentals – Black - Box and White Box Testing - Basis Path Testing - Control Structure Testing- Black – Box Testing- Object Oriented Testing Methods – Testing Methods Applicable at the Class Level Interclass Test Case Design – Testing for Specialized Environments, Architectures and Applications – Testing Pattern.

UNIT V

16 Hours

Software Quality – A Framework for Product Metrics- Metrics for the Analysis Model - Metrics for the Design Model- Metrics for Source Code – Metrics for Testing- Metrics for Maintenance. Attributes of Web-Based Systems and Applications – WebApp Engineering Layer - The Web Engineering Process – Web Engineering Best Practices. Formulating Web-Based Systems- Planning for Web Engineering Projects- Web Engineering Team – Project Management Issues for Web Engineering – Metrics for Web Engineering and WebApp- “Worst Practices” for WebApp Projects.

Text Books

Roger S Pressman *“Software Engineering, A Practitioners Approach”*, TMH, 6th Edition.

Unit I	: Chapter 1.1-1.5, 3.1, 3.2, 3.3, 3.4.1 - 3.4.4
Unit II	: Chapter 5.1 – 5.5, 7.1 – 7.3, 8.1 -8.7
Unit III	: Chapter 9.1 – 9.4, 10.1 – 10.4, 10.6
Unit IV	: Chapter 13.3 – 13.6, 14.1 – 14.7
Unit V	: Chapter 15.1-15.4, 16.1 – 16.3

Reference Books

Richard Fairley, *“Software Engineering Concepts”* TMH 30th reprint 2008.

Pedagogy

Chalk & Talk, E-Resources, Group Discussion

Teaching aids

Black Board, LCD Projector

Course Contents and Lecture Schedule

Module No.	Topic	No. of Lectures	Content Delivery Methods
UNIT - I			
1.1	The Evolving Role of Software	1	Chalk & Talk
1.2	The Changing Nature of Software Legacy Software	1	Chalk & Talk
1.3	Software Myths	1	Chalk & Talk
1.4	Prescriptive Models	3	PPT
1.5	The Water Fall Model	3	PPT
1.6	Incremental Process Models Evolutionary Process Models.	3	PPT
UNIT - II			
2.1	Software Engineering Practice - Communication Practices - Planning Practices - Modeling Practices - Construction Practice	2	Chalk & Talk
2.2	A Bridge to Design and Construction - Requirements Engineering Tasks	2	Chalk & Talk
2.3	Eliciting Requirements - Developing Use - Cases - Building the Analysis Model	2	Chalk & Talk
2.4	Requirements Analysis - Analysis Modeling Approaches - Data Modeling Concepts	3	PPT
2.5	Object Oriented Analysis - Scenario	3	PPT
2.6	Based Modeling - Flow Oriented Modeling - Class Based Modeling - Creating a behavioral Model	3	PPT
UNIT - III			
3.1	Design within the Context of Software Engineering - Design Process and Design Quality - Design Concepts - The Design Models - Pattern Based Software Design	2	Chalk & Talk

3.2	Software Architecture – Data Design – Architectural Styles and Patterns – Architectural Design	3	PPT
3.3	Assessing Alternative Architectural Design – Mapping Data Flow into a Software Architecture	3	Chalk & Talk
3.4	What is a Component – Designing class based Components- Conducting Component	2	PPT
3.5	Level Design – Object Constraint Language – Designing Conventional Components.	3	Chalk & Talk
3.6	The Golden Rules – User Interface Analysis and Design – Interfaces Analysis Interface Design steps – Design Evaluation	3	PPT
UNIT - IV			
4.1	A Strategic Approach to Software Testing – Strategic Issues – Test Strategies Conventional Software – Test Strategies for Object Oriented Software	3	Chalk & Talk
4.2	Validation Testing – System Testing – The Art of Debugging	2	PPT
4.3	Software Testing Fundamentals – Black - Box and White Box Testing - Basis Path Testing - Control Structure Testing- Black – Box Testing	3	PPT
4.4	Object Oriented Testing Methods	2	PPT
4.5	Testing Methods Applicable at the Class Level Interclass Test Case Design	3	Chalk & Talk
4.6	Testing for Specialized Environments, Architectures and Applications – Testing Pattern.	3	PPT

UNIT - V			
5.1	Software Quality – A Framework for Product Metrics- Metrics for the Analysis Model	2	Chalk & Talk
5.2	Metrics for the Design Model- Metrics for Source Code – Metrics for Testing- Metrics for Maintenance	2	PPT
5.3	Attributes of Web-Based Systems and Applications – WebApp Engineering Layer - The Web Engineering Process – Web Engineering Best Practices	3	PPT
5.4	Formulating Web-Based Systems- Planning for Web Engineering Projects- Web Engineering Team	3	Chalk & Talk
5.5	Web Engineering Team – Project Management Issues for Web Engineering	3	PPT
5.6	Metrics for Web Engineering and WebApp- “Worst Practices” for WebApp Projects.	3	PPT
Total		75	

Course Designer

Mr. K. A. Sheik Fareed

Assistant Professor of Information Technology

Course Code	Course Title	Category	Total Hours	Credits
20PCSE41	Computer Graphics and Multimedia	Elective -IV	75	4

Nature of Course	
Knowledge Oriented	
Skill Oriented	✓
Employability Oriented	
Entrepreneurship Oriented	

Course Relevance	
Local	
Regional	
National	
Global	✓

Preamble

To understand the multimedia communications systems, application and basic principles and to provide fundamental concepts of all graphics and multimedia concepts.

Course Outcomes (CO)

On the successful completion of the course the students will be able to

No.	Course Outcome	Knowledge Level
CO1	Discuss the basic concepts of computer graphics application and its algorithms	K1,K2,K3
CO2	Describe the concepts of windows viewing, clipping and 2D transformations	K1,K2,K3
CO3	Describe and demonstrate 3D transformation and hidden surfaces in transformation	K1,K2,K3,K4
CO4	Discuss and demonstrate the multimedia, visual display systems and file formats	K1,K2,K3,K4,K5
CO5	Demonstrate the audio and video formats and its broadcasting	K1,K2,K3,K4,K5

K1-Knowledge K2-Understand K3-Apply K4- Analyse K5- Evaluate

Mapping of CO with PO

	P01	P02	P03	P04	P05
CO1	2	3	1	3	3
CO2	3	1	2	3	2
CO3	1	3	2	3	3
CO4	3	2	2	3	2
CO5	3	3	1	2	3

1-Low

2-Medium

3-Strong

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	1	3	3
CO2	3	1	2	3	2
CO3	1	3	2	3	3
CO4	3	2	2	3	2
CO5	3	3	1	2	3

1-Low

2-Medium

3-Strong

Syllabus

UNIT I

15 Hours

Computer Graphic Applications: Introduction – Applications – Graphic Devices: Introduction – Display Systems – Hardware Components. Graphical User Interface: Introduction – Types of GUI – Designing a GUI – Principles for good GUI Design – User Interface Engineering – GUI Examples – Creating Graphical Interfaces – Scan Conversion: Line Drawing Algorithms – DDA Algorithm – Bresenham's Line Drawing Algorithm – General Bresenham's Algorithm – Bresenham's Circle Generation Algorithm Polygon Filling.

UNIT II

15 Hours

Windows and Clipping: Windows & Viewports – Window to Viewport Mapping – Clipping – Sutherland Cohen Subdivision Line Clipping Algorithm – Midpoint Subdivision Algorithm.

2D Transformation: Introduction Representations of Points in Matrix form – Representation of 2D points in any Matrix form – Transformation of points – Transformation – 2D Rotation – Reflection – Scaling – Shearing.

UNIT III

15 Hours

3D Transformation: Introduction – Representation of points – Representation of 3D object in Matrix form – 3D Translation – 3D Rotation – 3D Reflection – 3D Scaling – 3D Shearing. 3D Perspective Geometry: 3D Viewing – Introduction – Terms related to Projection – Orthographic Projection – Axonometric Projection – Oblique projection.

Hidden Surfaces: Hidden Surface and Lines – Back face Detection – Back face Removal – Z Buffer Algorithm – A Buffer Algorithm.

UNIT IV

15 Hours

Multimedia: An Overview – Introduction – Presentation and Production – Characteristics of Multimedia Presentation – Hardware and Software Requirements – Uses of Multimedia – **Visual Display Systems:** Introduction – Cathode Ray Tube – Video Adapter Card – Video Adapter Cable – Liquid Crystal Display – Plasma Display Panel. Text: Introduction – Types – Unicode Standard – Font – Insertion of text – Text Compression – File formats. **Image:** Introduction Standards – Color Management Systems – File formats.

UNIT V

15 Hours

Audio: Introduction – Nature – Fundamental Characteristics of sound – Elements of audio systems – MIDI – Sound card – Audio File formats and CODECs.

Video: Introduction Analog Video Camera – Transmission of video signals – Video signal formats – Television broadcasting standards – Digital Video – Digital Video Standards – **Video File formats & CODECs. Compression:** Introduction – CODECs – Types – Lossless Compression Techniques – Lossy Compression Techniques – JPEG Image Coding Standard – MPEG Standards Overview.

Text Books

ISR Group, ***“Computer Graphics”***, Tata McGraw Hill, 2006.

Ranjan Parekh, ***“Principles of Multimedia”***, Tata McGraw Hill 2006.

Reference Books

Malay K. Pakhira, ***“Computer Graphics, Multimedia and Animation”***, PHI, 2008.

Donold Hearn, Pauline Baker, ***“Computer Graphics”***, PHI, 2007.

Tay Vaughan, ***“Multimedia Making it work”***, TMH, 2007.

Pedagogy

Chalk & Talk, E-Resources, Group Discussion

Teaching aids

Black Board, LCD Projector, Charts and Mind Maps

Course Contents and Lecture Schedule

Module No.	Topic	No. of Lectures	Content Delivery Methods
UNIT – I			
1.1	Computer graphic applications	1	Chalk & Talk
1.2	Display Systems	2	PPT
1.3	Types of GUI	3	Discussion
1.4	Principles for good GUI Design	2	Chalk & Talk
1.5	DDA Algorithm	2	Chalk & Talk
1.6	Bresenham's Line Drawing Algorithm	2	Chalk & Talk
1.7	Bresenham's Circle Generation Algorithm Polygon Filling	3	PPT
UNIT – II			
2.1	Window to Viewport Mapping	3	Discussion
2.2	Sutherland Cohen Subdivision Line Clipping Algorithm	3	Chalk & Talk
2.3	Midpoint Subdivision Algorithm Midpoint Subdivision Algorithm	3	Chalk & Talk
2.4	Transformation of points	3	Chalk & Talk
2.5	2D Rotation	3	PPT
UNIT – III			
3.1	Representation of 3D object in Matrix form	3	PPT
3.2	3D Reflection	2	Chalk & Talk
3.3	3D Viewing	2	Discussion
3.4	Orthographic Projection	2	PPT
3.5	Z Buffer Algorithm	3	Chalk & Talk
3.6	A Buffer Algorithm	3	Chalk & Talk
UNIT – IV			
4.1	Characteristics of Multimedia Presentation	2	Discussion
4.2	Uses of Multimedia	2	Chalk & Talk
4.3	Cathode Ray Tube	2	Chalk & Talk
4.4	Video Adapter Cable	3	PPT
4.5	Unicode Standard	3	PPT
4.6	Text Compression	1	Chalk & Talk
4.7	Color Management Systems	2	PPT

UNIT -V			
5.1	MIDI	1	Chalk & Talk
5.2	Audio File formats and CODECs	2	Chalk & Talk
5.3	Video signal formats	2	Discussion
5.4	Lossless Compression Techniques	2	Chalk & Talk
5.5	Lossy Compression Techniques	2	Chalk & Talk
5.6	JPEG Image Coding Standard	3	PPT
5.7	MPEG Standards Overview	3	Chalk & Talk
Total		75	PPT

Course Designer

Mr. K. Iscaq Faizal

Assistant Professor of Information Technology

Course Code	Course Title	Category	Total Hours	Credits
20PCSE42	Digital Image Processing	Elective -IV	75	4

Nature of Course	
Knowledge Oriented	✓
Skill Oriented	
Employability Oriented	
Entrepreneurship Oriented	

Course Relevance	
Local	
Regional	
National	
Global	✓

Preamble

To study the image fundamentals and mathematical transforms necessary for image processing and to study the image enhancement techniques.

Course Outcomes (CO)

On the successful completion of the course the students will be able to

No.	Course Outcome	Knowledge Level
CO1	Understand the basic concepts and origins of digital image processing.	K1
CO2	Understand the concepts of image transformation and filters used in digital processing	K1,K2,K3
CO3	Understand and demonstrate Restoration and Reconstruction of image processing	K1,K2,K3,K4
CO4	Understand and demonstrate the colour processing and colour models of image	K1,K2,K3,K4
CO5	Demonstrate the image morphing and its algorithm	K1,K2,K3,K4,K5

K1-Knowledge K2-Understand K3-Apply K4- Analyse K5- Evaluate

Mapping of CO with PO

	P01	P02	P03	P04	P05
CO1	2	3	1	3	3
CO2	3	3	1	1	2
CO3	3	3	2	3	1
CO4	1	1	3	2	3
CO5	3	3	2	2	1

1-Low

2-Medium

3-Strong

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	1	2	3
CO2	3	2	1	3	2
CO3	1	3	2	3	3
CO4	2	3	3	3	1
CO5	3	3	2	1	3

1-Low

2-Medium

3-Strong

Syllabus

UNIT I

15 Hours

Digital Image Processing: Origins of Digital Image Processing - Steps in Digital Image Processing - Digital Image Fundamentals: Elements of Visual Perception - Light and the Electromagnetic Spectrum - Image Sensing and Acquisition - Image Sampling and Quantization - Basic Relationships between Pixels, Mathematical Tools used in Digital Image Processing.

UNIT II

15 Hours

Image Transformation & Filters: Basic Intensity Transformation Functions - Histogram Processing - Fundamentals of Spatial Filtering - Smoothing Spatial Filter - Sharpening Spatial Filters - Combining Spatial Enhancement methods - Fuzzy techniques for Intensity Transformation and Spatial Filtering. Filtering in the Frequency Domain: Preliminary Concepts - Sampling and the Fourier Transforms of Sampled Functions - The Discrete Fourier Transform (DFT) - Properties of the 2-D DFT - Filtering in the Frequency Domain - Image Smoothing and Sharpening using Frequency Domain Filters - Selective Filtering.

UNIT III

15 Hours

Image Restoration - Reconstruction and Image Segmentation: Image Degradation/Restoration process - Noise Models - Restoration in the presence of Noise only-Spatial Filtering - Periodic Noise Reduction by Frequency Domain Filtering - Linear - Position-Invariant Degradations - Estimating the Degradation Functions - Inverse Filtering - Wiener Square Error Filtering - Constrained Least Square Filtering - Geometric Mean Filter - Image Reconstruction from Projections. Image Segmentation: Point - Line and Edge Detection -Thresholding - Region-Based Segmentation - Segmentation Using Morphological Watersheds - Use of Motion in Segmentation.

UNIT IV

15 Hours

Color Image Processing: Color Fundamentals - Color Models - Pseudocolor Image Processing - Full Color Image Processing - Color Transformation - Smoothing and Sharpening - Image Segmentation Based on Color - Noise in Color Images. Wavelets and Multiresolution Processing: Multiresolution Expansion - Wavelet Transforms in One Dimension - The Fast Wavelet Transforms - Wavelet Transforms in Two Dimensions - Wavelet Packets. Image Compression: Fundamentals - Basic Compression Methods - Digital Image Watermarking.

UNIT V

15 Hours

Morphological Image Processing: Erosion and Dilation - Opening and Closing - The Hit-Or-Miss Transformation - Basic Morphological Algorithms - Gray-Scale Morphology. Object Recognition: Patterns and Pattern Classes - Recognition Based on Decision-Theoretic Methods - Structural Methods.

Text Books

Rafael C. Gonzalez, Richard E. Woods, "***Digital Image Processing***", 3rd Edition, Pearson Education, 2008.

UNIT I : Chapter 1 and 2

UNIT II : Chapter 3 and 4

UNIT III : Chapter 5 and 10

UNIT IV : Chapter 6 and 7

UNIT V : Chapter 9 and 12

Reference Books

Rafael C. Gonzalez, Richard E. Woods, "***Digital Image Processing using MATLAB***", 2nd Edition, Prentice Hall of India, 2002.

Jain, "***Fundamentals of Digital Image Processing***", Prentice Hall of India.

Pedagogy

Chalk & Talk, E-Resources, Group Discussion

Teaching aids

Black Board, LCD Projector

Course Contents and Lecture Schedule

Module No.	Topic	No. of Lectures	Content Delivery Methods
UNIT - I			
1.1	Digital Image Processing: Origins of Digital Image Processing	1	Chalk & Talk
1.2	Steps in Digital Image Processing	2	PPT
1.3	Digital Image Fundamentals: Elements of Visual Perception	2	PPT
1.4	Light and the Electromagnetic Spectrum	2	PPT
1.5	Image Sensing and Acquisition	2	PPT
1.6	Image Sampling and Quantization	2	PPT
1.7	Basic Relationships between Pixels	2	PPT
1.8	Mathematical Tools used in Digital Image Processing.	2	PPT
UNIT - II			
2.1	Image Transformation & Filters: Basic Intensity Transformation Functions	1	Discussion
2.2	Histogram Processing	1	PPT
2.3	Fundamentals of Spatial Filtering	1	PPT
2.4	Smoothing Spatial Filter	1	PPT
2.5	Sharpening Spatial Filters	1	PPT
2.6	Combining Spatial Enhancement methods	1	PPT
2.7	Fuzzy techniques for Intensity Transformation and Spatial Filtering.	1	Chalk & Talk
2.8	Filtering in the Frequency Domain: Preliminary Concepts	1	PPT
2.9	Sampling and the Fourier Transforms of Sampled Functions	2	PPT
2.10	The Discrete Fourier Transform (DFT)	1	PPT
2.11	Properties of the 2-D DFT	1	PPT
2.12	Filtering in the Frequency Domain	1	PPT
2.13	Image Smoothing and Sharpening using Frequency Domain Filters	1	PPT
2.14	Selective Filtering	1	PPT
UNIT - III			
3.1	Image Restoration, Reconstruction and Image Segmentation: Image Degradation/Restoration process	2	Chalk & Talk

3.2	Noise Models - Restoration in the presence of Noise only	1	PPT
3.3	Spatial Filtering - Periodic Noise Reduction by Frequency Domain Filtering	1	PPT
3.4	Linear - Position-Invariant Degradations	1	PPT
3.5	Estimating the Degradation Functions	1	PPT
3.6	Inverse Filtering - Wiener Square Error Filtering	1	PPT
3.7	Constrained Least Square Filtering - Geometric Mean Filter	1	PPT
3.8	Image Reconstruction from Projections	1	PPT
3.9	Image Segmentation: Point - Line and Edge Detection	1	PPT
3.10	Thresholding	1	PPT
3.11	Region-Based Segmentation	1	PPT
3.12	Segmentation Using Morphological Watersheds	2	PPT
3.13	Use of Motion in Segmentation	1	PPT
UNIT - IV			
4.1	Color Image Processing: Color Fundamentals	1	PPT
4.2	Color Models	1	PPT
4.3	Pseudocolor Image Processing	1	PPT
4.4	Full Color Image Processing - Color Transformation	1	PPT
4.5	Smoothing and Sharpening	1	PPT
4.6	Image Segmentation Based on Color	1	PPT
4.7	Noise in Color Images	1	PPT
4.8	Wavelets and Multiresolution Processing: Multi resolution Expansion	1	PPT
4.9	Wavelet Transforms in One Dimension	1	PPT
4.10	The Fast Wavelet Transforms	1	PPT
4.11	Wavelet Transforms in Two Dimensions	1	PPT
4.12	Wavelet Packets	1	PPT
4.13	Image Compression: Fundamentals	1	PPT
4.14	Basic Compression Methods	1	PPT
4.15	Digital Image Watermarking	1	PPT

UNIT - V			
5.1	Morphological Image Processing: Erosion and Dilation	2	PPT
5.2	Opening and Closing	1	Chalk & Talk
5.3	The Hit-Or-Miss Transformation	2	PPT
5.4	Basic Morphological Algorithms	2	PPT
5.5	Gray-Scale Morphology	1	PPT
5.6	Object Recognition: Patterns and Pattern Classes	3	PPT
5.7	Recognition Based on Decision	2	PPT
5.8	Theoretic Methods	1	PPT
5.9	Structural Methods	1	PPT
Total		75	

Course Designer

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