

Sadakathullah Appa College **(Autonomous)**

(Reaccredited by NAAC at an 'A' Grade. An ISO 9001:2015 Certified Institution)

Rahmath Nagar, Tirunelveli - 11.
Tamil Nadu.

DEPARTMENT OF COMPUTER SCIENCE



CBCS SYLLABUS

For

B.Sc. COMPUTER SCIENCE

(Applicable for students admitted in June 2021 and onwards)

(As per the Resolutions of the Academic Council Meetings

held on . . . 2021)

B.Sc. Computer Science - CBCS Syllabus
TITLE OF THE PAPERS, CREDITS & MARKS

I SEMESTER 2021

I	TA - I		21ULTA11	6	3	25	75	100
	AR - I		21ULAR11					
II	EN - I		21ULEN11	6	3	25	75	100
III	C-I	C Programming	21UCCS11	4	4	25	75	100
	C-II	Discrete Mathematics	21UCCS12	4	4	25	75	100
	CP-I	C-Programming Practical	21UCCS1P1	2	1	40	60	100/2
	A-I/1	Office Automation	21UACS11	4	3	25	75	100
	A-I/1P	Office Automation Practical	21UACS1P1	2	1	40	60	100/2
IV	AECC-I	Value Education - I	21USVE1A	2	2	25	75	100
		Value Education - II	21USVE1B					
			TOTAL	30	21			700

II SEMESTER 2021

I	TA - II		21ULTA21	6	3	25	75	100
	AR - II		21ULAR21					
II	EN - II		21ULEN21	6	3	25	75	100
III	C- III	Object-oriented Programming with C++	21UCCS21	4	4	25	75	100
	C- IV	Digital Principles & Applications	21UCCS22	4	4	25	75	100
	CP-II	Object-oriented Programming with C++ -Practical	21UCCS2P1	2	1	40	60	100/2
	A-I/2	Flash	21UACS21	4	3	25	75	100
	A-I/2P	Flash Practical	21UACS2P1	2	1	40	60	100/2
IV	AECC-II	Environmental Studies	21UENS21	2	2	25	75	100
			TOTAL	30	21			700

III SEMESTER 2021								
III	C - V	Java Programming	21UCCS31	4	4	25	75	100
	C - VI	Computer Graphics	21UCCS32	4	4	25	75	100
	C - VII	Web Technology	21UCCS33	4	4	25	75	100
	CP-III	Java Programming Practical	21UCCS3P1	4	2	40	60	100
	CP-IV	Web Technology Practical	21UCCS3P2	2	1	40	60	100/2
	A-II/1	UNIX and Shell Programming	21UACS31	4	3	25	75	100
	A-II/1P	UNIX and Shell Programming Practical	21UACS3P1	2	1	40	60	100/2
	SEC-I	Operations Research	21UECS31	2	2	25	75	100
	SEC-II	MOOC - NPTEL	21UECS32	2	2	25	75	100
IV	NME - I	Office Automation	21UNCS31	2	2	25	75	100
TOTAL				30	25			900
IV SEMESTER 2021								
III	C-VIII	Operating System	21UCCS41	4	4	25	75	100
	C-IX	Active Server Pages	21UCCS42	4	4	25	75	100
	C-X	PHP	21UCCS43	4	4	25	75	100
	CP-V	PHP Practical	21UCCS4P1	4	2	40	60	100
	CP-VI	Active Server Pages Practical	21UECS4P2	2	1	40	60	100/2
	A-II/2	Python Programming	21UACS41	4	3	25	75	100
	A-II/2P	Python Programming Practical	21UACS4P1	2	1	40	60	100/2
	SEC-III	Personality Development	21UECS41	2	2	25	75	100
	SEC-IV	Data Structures in C	21UECS42	2	2	25	75	100
IV	NME-II	Web Design	21UNCS41	2	2	25	75	100
V	EX	Extension Activities (Choose from the list)	--	--	1	--	--	--
		SOP	--	--	1	--	--	--
VI		Field Work / Internship Training	--	--	2	--	--	--
TOTAL				30	29			900

V SEMESTER 2021								
III	C-XI	Software Engineering	21UCCS51	5	4	25	75	100
	C-XII	J2EE	21UCCS52	4	4	25	75	100
	C-XIII	Microprocessor	21UCCS53	4	4	25	75	100
	CP-VII	J2EE Practical	21UCCS5P1	4	2	40	60	100
	CP-VIII	Microprocessor Practical	21UCCS5P2	4	2	40	60	100
	DSE-I	RDBMS	21UECS5A	4	3	25	75	100
		ANDROID Programming	21UECS5B					
	DSE-II	Quantitative Aptitude	21UECS5C	4	3	40	60	100
Artificial Intelligence		21UECS5D						
IV	EX	Library Reading Hour	-----	1	--	--	--	--
TOTAL				30	22			700

VI SEMESTER 2021								
III	C-XIV	Data communications and Networking	21UCCS61	4	4	25	75	100
	C-XV	C# Programming	21UCCS62	4	4	25	75	100
	C-XVI	ORACLE	21UCCS63	4	4	25	75	100
	CP-IX	C# Programming Practical	21UCCS6P1	4	2	40	60	100
	CP-X	ORACLE Practical	21UCCS6P2	4	2	40	60	100
	DSE-III	Mobile Communications	21UECS6A	4	3	25	75	100
		DATA MINING	21UECS6B					
DSE-IV	PROJECT	21UECS6P	4	6	40	60	100	
IV	SEC-V	Internet of Things	21USCS61	2	2	25	75	100
TOTAL				30	27			800

Department of Computer Science
Programme : B.A / B.Sc./ B.Com. / M.A / M.Sc./ M.Com.
Programme Learning Outcomes

PLO 1: Disciplinary Knowledge

- Acquire scientific knowledge and the understanding of major concepts and theoretical principles.

PLO 2: Creative Thinking and Practical Skills / Problem Solving Skills

- Enrich skills of observation / research related skills to draw logical inferences from scientific experiments/ programming and skills of creative thinking to develop novel ideas.
- Hone problem solving skills in theoretical, experimental and computational areas and to apply them in research fields and in real life situations.

PLO 3: Sense of inquiry and Skilled Communicator

- Develop the capability for raising appropriate questions relating to the current/emerging issues encountered in the scientific field and to plan, execute and express the results of experiments / investigations through technical writings as well as through oral presentations.

PLO 4: Ethical Awareness / Team Work / Environmental Conservation and Sustainability

- Equip them for conducting work as an individual / as a member, or as a leader in diverse teams upholding values such as honesty and precision and thus preventing unethical behaviours such as fabrication, falsification, misrepresentation of data, plagiarism etc. to ensure academic integrity.
- Realise that environment and humans are dependent on one another and to know about the responsible management of our ecosystem for survival, and for the well-being of the future generation as well.

PLO 5: Usage of ICT/ Lifelong Learning / Self-Directed Learning

- Inculcate the habit of learning continuously through the effective adoption of ICT to update knowledge in the emerging areas in Sciences for inventions/discoveries and also to engage in remote / independent learning.

Programme Specific Outcomes

PSO	Upon completion of B.Sc. Computer Science Degree Programme, the students will be able to:	PLOs Mapped
PSO-1	Develop sufficient skills with ethical concerns in the areas of programming, multimedia, animation, and networking through various concepts of computer languages.	1,4,5
PSO-2	Build the basic knowledge of computer organization, digital computers and circuits to apply and solve real time problems in research fields.	1,2,3
PSO-3	Illustrate the nature of software development process, testing and effective document preparation to address the current issues encountered in the scientific fields.	1,3
PSO-4	Distinguish and explain data distribution concepts with that of networking to equip themselves as individuals or as a team.	2,4
PSO-5	Construct their knowledge to apply mathematical concepts on common computing applications besides developing web pages through self-directed learning using various technologies.	1,5

Semester – I

Course Title	C Programming
Total Hrs	60
Hrs/Week	4
Sub.Code	21UCCS11
Course Type	C I
Credits	4
Marks	100

General Objective:

To understand the tools and features of the programming language to design programs and develop software

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Understand the basic concepts of C Programming.
CO-2	Distinguish loops and conditional statements
CO-3	Classify arrays and strings.
CO-4	Apply the concepts of built-in functions and develop user defined functions in C Programming.
CO-5	Categorize the structures and union besides pointers.

UNIT I

Character Set – C tokens – Keywords and Identifiers – Constants, Variables, data types-Declaration of variables – declaration of storage classes – Assigning values to the variables – defining symbolic constants – Declaring a variable as constant – Arithmetic operators – Relational operators – Logical operators – Assignment operators – Increment and decrement operators – Conditional operators – bitwise operators – Special operators – Arithmetic expressions – evaluation of expressions – precedence of Arithmetic operators- Type conversions in expressions – Mathematical functions.

UNIT II

Decision Making – If Statement – The If-else statement – Nesting of If statement – The else-if ladder – the switch statement – the ?: operator – the goto statement-Decision making and looping – the while statement – the do statement – the for statement – jumps in loops.

UNIT III

Arrays – one dimensional, two dimensional and multi dimensional arrays – Dynamic arrays – Character arrays and strings – Declaring and initializing string variables – Reading string from terminals – string handling functions.

UNIT IV

User defined functions – Category of functions – Nesting of functions – Recursive functions – Passing arrays, strings to functions – the scope, visibility and lifetime of variables.

UNIT V

Structure and Unions – Accessing structure members – Arrays of structures – Arrays within structures – Unions – bit fields – pointers – pointer expressions – pointers and arrays – pointers and character strings – Array of pointers – pointers and structures.

TEXT BOOK:

Computing Fundamentals and C Programming – E Balagurusamy –Tata McGraw – Hill Publishing Company.

Course Outcomes

Course Outcomes: The learners will be able to:

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Identify the use of basic concepts of C programming.	1	Understanding
CO-2	Develop their knowledge to design programs using loops and conditional statements.	1,5	Applying
CO-3	Apply the concepts of arrays and strings in the real time applications.	1,5	Applying
CO-4	Explain the concepts of built-in and user defined functions in C Programming.	1,5	Analyzing
CO-5	Assess structures, union and pointers to manage memory locations effectively.	1,5	Evaluating

Relationship Matrix

Semester	Course Code	Title of the Course					Hours	Credit		
I	21UCCS11	C Programming					4	4		
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓			✓	✓	✓				✓
CO-2	✓			✓	✓	✓				✓
CO-3	✓			✓	✓	✓				✓
CO-4	✓			✓	✓	✓				✓
CO-5	✓			✓	✓	✓				✓
	Number of matches (✓) =25 Relationship = Low/ Medium /High									

Prepared by
 Mrs. S. Fathima Suhara
 Name and Signature

Checked by

 Head of the Department

Semester – I

Course Title	Discrete Mathematics
Total Hrs	60
Hrs/Week	4
Sub.Code	21UCCS12
Course Type	C – II
Credits	4
Marks	100

General Objective:

Simplify and evaluate basic logic statements including compound statements, implications, inverses, converses, and contra positives using truth tables and the properties of logic. Apply basic concepts for clear understanding of mathematical principles and to solve practical problems. Understand the concepts of graph theory.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Understand the concepts and principles of sets.
CO-2	Understand the concepts of relations and their types.
CO-3	Simplify and evaluate the Logical statements.
CO-4	Apply the concepts of vectors and matrices to solve problems.
CO-5	Study and apply the various types of graphs and its applications to solve problems.

Unit – I Set theory:

Sets and elements, Universal Set and Empty Set, Subsets, Venn Diagrams, Set Operations, Algebra of Sets and Duality, Finite, Infinite Sets and Counting Principle, The Inclusion-Exclusion Principle, Classes of Sets, Power Sets, Partitions.

Unit – II Relations:

Product Sets, Relations, Picture Representations of Relations, Composition of Relations, Types of Relations, Closure Properties, Equivalence Relations, Partial Ordering Relations.

Unit – III Logic and Propositional Calculus:

Propositions and Compound Propositions, Basic Logical Operations, Propositions and Truth Tables, Tautologies and Contradictions, Logical Equivalence, Algebra of propositions, Conditional and Biconditional statements, Arguments, Logical Implication

Unit – IV Vectors and Matrices:

Vectors, Matrices, Matrix Addition and Scalar Multiplication, Matrix Multiplication, Transpose, Square Matrices, Invertible(Non-singular) Matrices, Inverses, Determinants, Boolean(Zero-One) Matrices.

Unit – V Graph Theory:

Graphs and Multigraphs, Subgraphs, Paths, Connectivity, Euler graph, Hamiltonian graph, Labeled and Weighted graphs, Complete, Regular and Bipartite graphs, Tree graphs, Planar graphs.

Textbooks:

Discrete Mathematics – Seymour Lipschutz and Marc Lars Lipson - Schaum's Series – Third Edition – Tata McGraw Hill Publications.

Reference Books:

1. Modern Algebra - Arumugam and Isaac, SciTech Publication.
2. Graph Theory - Arumugam and Isaac, SciTech Publication.

Course Outcomes: The learners will be able to:

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain the basic principles of sets and operation in sets	1,5	Understanding
CO-2	Understand the concept of Relations and its types	1,2,5	Understanding
CO-3	Apply logical reasoning to solve a variety of problems.	1,2,5	Applying
CO-4	Apply the concept of vectors and matrices to solve the problem.	1,5	Applying
CO-5	Analyse various types of graphs and apply it in problem solving.	1,5	Analyzing

Relationship Matrix

Semester	Course Code	Title of the Course					Hours	Credit		
I	21UCCS12	Discrete Mathematics					60	4		
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓			✓	✓	✓				✓
CO-2	✓	✓	✓	✓	✓	✓				✓
CO-3	✓	✓	✓	✓	✓	✓				✓
CO-4	✓			✓	✓	✓				✓
CO-5	✓			✓	✓	✓				✓
	Number of matches (✓) = 29 Relationship = Low/ Medium /High									

Prepared by
Name and Signature
M. Yogasini

Checked by
Head of the Department

Semester – I

Course Title	C Programming Practical
Total Hrs	30
Hrs/Week	2
Sub.Code	21UCCS1P1
Course Type	CP I
Credits	1
Marks	50

General Objective:

To develop the ability of framing the programs and enrich sufficient knowledge in creating software.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Apply the concept of library functions.
CO-2	Implement the concepts of loops.
CO-3	Compute arrays in the concept of Matrix Multiplication and Addition
CO-4	Developing programs on strings for effective usage of memory allocation.
CO-5	Create a user defined function with predefined functions.

C - PROGRAMMING (PRACTICAL)

1. Program using Library Functions (minimum 5 functions)
2. Program using nested if-else and/or else-if ladder
3. Program using 'switch' and/or conditional operator
4. Program using for-loop
5. Program using while loop
6. Program using do-loop
7. Program using nested loops
8. Program dealing One-dimensional Array
9. Program using Two-dimensional Array
10. Program using user-defined Functions
11. Program using Recursive Function
12. Program implementing structure
13. Program implementing union
14. Program using string methods

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Solve the various mathematical functions	1,5	Applying
CO-2	Develop programs based on loops	1,5	Applying
CO-3	Apply the concept of Arrays in Matrix Addition and Matrix Multiplication.	1,5	Applying
CO-4	Prepare programs using String Methods.	1,5	Creating
CO-5	Design User Defined Functions and make use of it in an effective manner	1,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credit						
I	21UCCS1P1	C Programming Practical	2	1						
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓			✓	✓	✓				✓
CO-2	✓			✓	✓	✓				✓
CO-3	✓			✓	✓	✓				✓
CO-4	✓			✓	✓	✓				✓
CO-5	✓			✓	✓	✓				✓
Number of matches (✓) = 25 Relationship = Low/ Medium /High										

Prepared by

Checked by

Mrs. S. Fathima Suhara

Name and Signature

Head of the Department

Semester – I

Course Title	OFFICE AUTOMATION
Total Hrs	60
Hrs/Week	4
Sub.Code	21UACS11
Course Type	A-I/1
Credits	3
Marks	100

General Objective:

The backbone of office automation is a LAN, which allows users to transfer data, mail and even voice across the network and including dictation, typing, filing, copying, fax, Telex, microfilm and all office functions, Records management, telephone and telephone switchboard operations, fall into this category.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Understand the concept of manipulation of relay office information needed for accomplishing basic tasks.
CO-2	Apply the concept of mail merge.
CO-3	Analyze business productivity and optimize existing office procedure which saves time.
CO-4	Create and Edit spreadsheet document and files and images.
CO-5	Design and create the concept of validation and goal seek and skills in enhancing the PowerPoint slides with animation and sound effects.

UNIT I Documentation Using MS-Word:

Introduction to Office Automation, Creating & Editing Document, Formatting Document, Page Formatting, Bookmark.

UNIT II Advance MS-Word:

Advance Features of MS-Word [Mail Merge], Tables, File Management, Printing, Styles.

UNIT III Electronic Spread Sheet using MS-Excel:

Introduction to MS-Excel, Creating & Editing Worksheet, Formulas and Functions, Charts.

UNIT IV Advance features of MS- Excel:

Formatting and Essential Operations, Data Sorting, Filtering data in worksheet, Validation, Goal Seek.

UNIT V Presentation Using MS-PowerPoint:

Presentations, Creating Slides, Manipulating & Enhancing Slides, Custom Animation.

TEXT BOOK:

Microsoft Office – Complete Reference – BPB Publication

REFERENCE BOOK:

Learn Microsoft Office – Russell A. Stultz – BPB Publication.

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand the concept of manipulation of relay office information needed for accomplishing basic tasks.	1,2	Understanding
CO-2	Apply the concept of mail merge.	2,3,5	Applying
CO-3	Analyze business productivity and optimize existing office procedure which saves time.	2,3,5	Analyzing
CO-4	Create and Edit spreadsheet document and files and images.	1,2,3,5	Creating
CO-5	Design and create the concept of validation and goal seek and skills in enhancing the PowerPoint slides with animation and sound effects.	1,3,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credit						
I	21UACS11	OFFICE AUTOMATION	60	4						
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PL O 2	PL O 3	PL O 4	PL O 5	PSO 1	PSO 2	PS O 3	PSO 4	PSO 5
CO-1	✓	✓		✓	✓	✓	✓			
CO-2	✓	✓	✓	✓	✓		✓	✓		✓
CO-3	✓	✓	✓	✓	✓		✓	✓		✓
CO-4	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO-5	✓	✓	✓	✓	✓	✓		✓		✓
Number of matches (✓) = 39 Relationship = Low/Mediam/ High										

Prepared by
V. Uma Devi
Name and Signature

Checked by
Dr. A. Shakul Hamid
Head of the Department

Semester – I

Course Title	OFFICE AUTOMATION PRACTICAL
Total Hrs	30
Hrs/Week	2
Sub.Code	21UACS1P1
Course Type	A-I/1P
Credits	1
Marks	100

General Objective:

The backbone of office automation is a LAN, which allows users to transfer data, mail and even voice across the network and including dictation, typing, filing, copying, fax, Telex, microfilm and all office functions, Records management, telephone and telephone switchboard operations, fall into this category.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Understand the concept of manipulation of relay office information needed for accomplishing basic tasks.
CO-2	Apply the concept of mail merge.
CO-3	Analyze business productivity and optimize existing office procedure which saves time.
CO-4	Create and Edit spreadsheet document and files and images.
CO-5	Design and create the concept of validation and goal seek and skills in enhancing the PowerPoint slides with animation and sound effects.

MS WORD 2000

1. Typing letters, Editing and Printing.
2. Using Spell Check and Thesaurus.
3. Designing a Cover Page with Word Art.
4. Using Header, Footer, Bookmark, End notes and Foot notes.
5. Mail merge a letter to an address file.
6. Typing Mathematical equations and symbols.
7. Create a table.

POWER POINT 2000

1. Creation of presentation with different styles on a given topic of current interest.
2. Preparing Presentation for a topic in the study of all courses.

EXCEL 2000

1. Entering spread sheets with formula
2. Entering spreadsheet and doing Statistical Calculations
3. Printing of Graphs and charts for the given data.
4. Creating and using Macros.
5. Create a list of data using Sorting
6. Create a list of data using Validation option
7. Create spreadsheet with the concept of Goal Seek and Scenario.

TEXT BOOK:

Microsoft Office – Complete Reference – BPB Publication

REFERENCE BOOK:

Learn Microsoft Office – Russell A. Stultz – BPB Publication.

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand the concept of manipulation of relay office information needed for accomplishing basic tasks.	1,2	Understanding
CO-2	Apply the concept of mail merge.	2,3,5	Applying
CO-3	Analyze business productivity and optimize existing office procedure which saves time.	2,3,5	Analyzing
CO-4	Create and Edit spreadsheet document and files and images.	1,2,3,5	Creating
CO-5	Design and create the concept of validation and goal seek and skills in enhancing the PowerPoint slides with animation and sound effects.	1,3,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course					Hours	Credit				
I	21UACS1P1	OFFICE AUTOMATION PRACTICAL					30	1				
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)						
	PLO 1	PLO 2	PL O 3	PL O 4	PLO 5	PS O 1	PSO 2	PS O 3	PSO 4	PSO 5		
CO-1	✓	✓		✓	✓	✓	✓					
CO-2	✓	✓	✓	✓	✓		✓	✓		✓		
CO-3	✓	✓	✓	✓	✓		✓	✓		✓		
CO-4	✓	✓	✓	✓	✓	✓	✓	✓		✓		
CO-5	✓	✓	✓	✓	✓	✓		✓		✓		
Number of matches (✓) = 39 Relationship = Low/Medium/ High												

Prepared by
V. Uma Devi
Name and Signature

Checked by
Dr. A. Shakul Hamid
Head of the Department

Semester – II

Course Title	Object Oriented Programming with C++
Total Hrs	60
Hrs/Week	4
Sub.Code	21UCCS21
Course Type	C III
Credits	4
Marks	100

General Objective:

C++ improves the concept of Object Oriented features and equip knowledge in creating the Syntax and semantics of this Language.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Classify the concepts of OOPS and learn how to design C++ Classes for Code reuse.
CO-2	Compare the Concept of Constructor and Destructor.
CO-3	Criticize on operator overloading and rules for operator overloading.
CO-4	Predict the concept of Inheritance and apply constructor in the derived classes
CO-5	Develop files and enhance knowledge in various files operations and random access.

UNIT I Classes and objects

Introduction- C structures revisited - specifying a class- defining member functions - a c++ program with class - Making an outside function inline - Nesting of member functions - Private member functions - Array within a class - Memory allocation for objects - Static data members -Static member functions - Array of objects - Object as function arguments - Friendly functions - returning objects.

UNIT II Constructors and Destructors

Introduction - constructors - parameterized constructors - multiple constructor in a class - constructor with default arguments - dynamic initialization of objects - copy constructor - dynamic constructors - constructing two - dimensional arrays - const objects - Destructors.

UNIT III Operator overloading

Introduction - defining operator overloading - overloading unary operators - overloading binary operators - overloading binary operators using friends - manipulation of strings using operators - rules for overloading operators - Type Conversions.

UNIT IV Inheritance: Extending classes

Introduction - defining derived classes- single inheritance - making a private member inheritable - multilevel inheritance- multiple inheritance - hierarchical inheritance - hybrid inheritance - virtual base classes - abstract classes - constructors in derived classes- member classes: Nesting of classes.

UNIT V Working with Files

Introduction -classes for file stream operations - opening and closing a file - detecting End-of-file - more about open(): file modes - file pointers and their manipulations- sequential input and output operations- updating a file: Random Access - error-handling during file operations.

TEXT BOOKS:

Object –Oriented Programming with C++ By E.Balagurusamy, The McGraw-Hill, 4th Edition. Chapters: 5 (except 5.17, 5.18, 5.19), 6, 7, 8, 15.

REFERENCE BOOKS:

Object – Oriented programming in Turbo C++ By Robert Lafore

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Discuss Object Oriented approach in connection with C++	1	Understanding
CO-2	Develop programs on constructor and Destructors	1,3,5	Applying
CO-3	Analyze the concept of function overloading, operator overloading.	1,3,5	Analyzing
CO-4	Classify inheritance with the understanding of run time polymorphism and compile time polymorphism.	1,3,5	Understanding, Analyzing
CO-5	Create and process File operations in C++	1,3,5	Applying

Relationship Matrix

Semester	Course Code	Title of the Course					Hours	Credit		
II	21UCCS21	Object Oriented Programming with C++					4	4		
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓		✓	✓	✓	✓				
CO-2	✓		✓	✓	✓	✓		✓		✓
CO-3	✓		✓	✓	✓	✓		✓		✓
CO-4	✓		✓	✓	✓	✓		✓		✓
CO-5	✓		✓	✓	✓	✓		✓		✓
Number of matches (✓) = 33 Relationship = Low/Medium/ High										

Prepared by
Mrs. J. Jannathul Firthous
Name and Signature

Checked by
Head of the Department

Semester – II

Course Title	Digital Principles and Applications
Total Hrs	60
Hrs/Week	4
Sub.Code	21UCCS22
Course Type	C-IV
Credits	4
Marks	100

General Objective:

To learn fundamentals of number systems and building blocks used in digital computer. Understand the concepts of logic gates and logic circuits. Learn registers and counters to build circuits.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Understand the concept of number systems and their applications.
CO-2	Apply the logical gates to build circuits.
CO-3	Understand various types of logical circuits.
CO-4	Learn registers and its types.
CO-5	Learn counters and its types and apply the concept of circuits.

Unit – I Number Systems:

Binary Addition and Subtraction – Binary Multiplication and Division. Converting Decimal numbers to Binary- Negative numbers – Use of Complements to represent Negative numbers – Binary number complements – Binary-Coded-Decimal(BCD) Number – Octal and Hexadecimal number systems. .

Unit – II Boolean Algebra and Gate Networks:

Fundamental concepts of Boolean algebra – Logical multiplication – AND gates and OR gates – complementation and inverters – logic expressions evaluation – Basic laws of Boolean Algebra – De Morgan’s theorem – Duality of boolean algebra - Sum of Products (SOPs) and Product of Sums (POSs) – Map Simplification using Karnaugh Maps – Don’t care conditions.

Unit – III Logic Circuits:

Combinational Circuits - Half Adder – Full Adder. Flip-Flop – SR flip-flops – D flip-flop - JK flip flop – T flip_flop – Edge_Triggered flip-flops.

Unit – IV Registers:

Registers with parallel load- four bit registers - Shift Registers – four bit shift registers-Bidirectional Shift Registers with parallel load

Unit – V Counters:

Binary counter – Ripple counter with parallel load - BCD counters – four bit Synchronous and Asynchronous counters – Shift Counter – Ring Counter

Textbooks:

1. Digital computer Fundamentals – Thomas C. Bartee, Sixth Edition, McGraw – Hill Publications
2. Computer System Architecture – M.Morris Mano, third Edition, PHI Publication

Reference Books:

Digital principles and Applications – Malvino and leach, TMH publications, fifth Editions.

Course Outcomes: The learners will be able to:

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand fundamentals of number system, binary codes and Boolean algebra to minimize logic expression.	1,5	Understanding
CO-2	Illustrate k-map to minimize and optimize logic functions.	1,5	Applying
CO-3	Deduce knowledge about various and logic families.	1,2,5	Analyzing
CO-4	Analyze the circuits of logic families.	1,2,5	Analyzing
CO-5	Discriminate the basic concepts of multiplexer and flip flop and counters.	1,5	Evaluating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credit						
II	21UCCS22	Digital Principles and Applications	60	4						
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO3	PLO4	PLO5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓			✓	✓	✓	✓			✓
CO-2	✓			✓	✓	✓	✓			✓
CO-3	✓	✓	✓	✓	✓	✓	✓			✓
CO-4	✓	✓	✓	✓	✓	✓	✓			✓
CO-5	✓			✓	✓	✓	✓			✓
	Number of matches (✓) = 34 Relationship = Low/Medium/ High									

Prepared by
Name and Signature
M.Yogasini

Checked by
Head of the Department

Semester – II

Course Title	Object Oriented Programming with C++ Practical
Total Hrs	30
Hrs/Week	2
Sub.Code	21UCCS2P1
Course Type	CP II
Credits	1
Marks	50

General Objective:

Improve the knowledge in the programming style and reliability. practice the use of C++ classes and class libraries, arrays, vectors, inheritance and file I/O stream concepts.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Apply the concepts of classes and objects.
CO-2	Develop programs using Member Functions for efficiency and performance.
CO-3	Implement arrays for effective access of memory storage.
CO-4	Implement overloading operators and its types.
CO-5	Demonstrate inheritance and develop applications using stream I/O and File I/O.

OBJECT ORIENTED PROGRAMMING WITH C++ (PRACTICAL)

1. Program using arrays within a class.
2. Program using nesting of member functions
3. Program using static class members.
4. Program using array of objects.
5. Program implementing overloaded constructors.
6. Program that initializes objects dynamically
7. Program implementing Two-dimensional arrays.
8. Program to overload unary operators.
9. Program to overload binary operators.
10. Program to overload operators using friend functions.
11. Program implementing multilevel inheritances
12. Program implementing multiple inheritances
13. Program to work with multiple files.

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Develop programs on classes and objects.	1	Applying
CO-2	Illustrate the concept of member function to manipulate classes and objects	1,5	Analyzing
CO-3	Classify Arrays for the concept of Matrix Multiplication and Addition	1,5	Analyzing
CO-4	Create overloading operators using string Functions	1,5	Creating
CO-5	Develop inheritance and process data manipulation using c++	1,3,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course					Hours	Credit		
II	21UCCS2P1	Object Oriented Programming with C++ Practical					2	1		
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓			✓	✓	✓				
CO-2	✓			✓	✓	✓				✓
CO-3	✓			✓	✓	✓				✓
CO-4	✓			✓	✓	✓				✓
CO-5	✓		✓	✓	✓	✓		✓		✓
Number of matches (✓) = 26..... Relationship = Low/ Medium /High										

Prepared by
Mrs. J. Jannathul Firthous

Checked by

Name and Signature

Head of the Department

Semester – II

Course Title	FLASH
Total Hrs	60
Hrs/Week	4
Sub.Code	21UACS21
Course Type	A-I/2
Credits	3
Marks	100

General Objective:

To understand various tools and features of flash software to create graphics based animation.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Understand the various tools and techniques to create, test and publish a flash movie
CO-2	Create objects and apply colors
CO-3	Apply the concept of transformation, aligning the objects and works with text.
CO-4	Create symbols and instances
CO-5	Perform various animations like shape, motion tweening.

UNIT I

Introduction to Flash: Flash files and player – Introducing the Flash Workspace – Tools –Panels – Component Inspector Panel – Timeline – Frames – Concept of frames – Scenes in Flash – Layers in Flash –Testing a flash movie – Publishing a flash movie

UNIT II

Working with Graphics and Color : Understanding Vector and Bitmap – Selecting objects –Creating objects in flash - Fills and Outlines- Colors- The Color Palette –Color swatches panel-Color mixer panel-Applying a locked gradient as a Fill.

UNIT III

Transformation and Aligning Graphics: Grouping Objects – Stacking order of objects – Breaking apart groups and objects – Transforming the objects – Aligning objects.

Working with text: Understanding Font Display – Modifying text attributes – Check spelling feature – Transforming Text.

UNIT IV

Symbols and Library: Creating Symbols and instances – Creating a button – Editing symbols – Modifying the instance of a symbol – Library – Using the library – Using the Common Library – Creating Custom library.

UNIT V

Animation: Working with Time line effects – Using the Explode Timeline Effect - Frame by Frame Animation Technique.

Tweening: Motion Tweening to create animations – Shape Tweening to create animations– Creating masking effects.

TEXT BOOK:

1. Flash 8 in Simple steps, Salini Gupta and Aditya gupta, Dreamtech Press, 2006

REFERENCE BOOK:

- 1.Macromedia Flash 8 Bible, Robert Reinhardt and Snoc Dowd, John Wiley & sons, 2006

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand the various tools and techniques to create, test and publish a flash movie	1,3,5	Understanding
CO-2	Apply colors and objects	1,3,5	Applying
CO-3	Apply and design the concept of transformation, aligning the objects and works with text.	1,2,3,5	Creating
CO-4	Create symbols and instances	1,3,5	Creating
CO-5	Design various animations like shape, motion tweening.	1,3,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credit						
II	21UACS21	FLASH	4	3						
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO4	PLO5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓		✓	✓		✓		✓
CO-2	✓	✓	✓		✓	✓		✓		✓
CO-3	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO-4	✓	✓	✓		✓	✓		✓		✓
CO-5	✓	✓	✓		✓	✓		✓		✓
Number of matches (✓) = 37 Relationship = Low/Medium/ High										

Prepared by
P. Neamathul Fayed
Name and Signature

Checked by
Dr. A. Shakul Hamid
Head of the Department

Semester – II

Course Title	FLASH PRACTICAL
Total Hrs	30
Hrs/Week	2
Sub.Code	21UACS2P1
Course Type	A-I/2P
Credits	1
Marks	50

General Objective:

To understand various tools and features of flash software to create graphics based animation.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Understand the various tools and techniques to create, test and publish a flash movie
CO-2	Create objects and apply colors
CO-3	Apply the concept of transformation, aligning the objects and works with text.
CO-4	Create symbols and instances
CO-5	Perform various animations like shape, motion tweening.

1. Create and change the color of an object by inserting key frames.
2. Skewing, rotating and flipping objects.
3. Create a Draggable Movie Clip
4. Testing a movie in a Web Browser.
5. Creating a Button.
6. Working with Timeline Effects.
7. Creating Animations on Text.
8. Moving an object using Motion Tweening.
9. Moving an object along the path using Motion Tweening .
10. Creating Animations using Shape Tweening.
11. Creating Masking Effects using Motion Tweening.
12. Creating Masking Effects using Shape Tweening.

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand the various tools and techniques to create, test and publish a flash movie	1,3,5	Understanding
CO-2	Apply colors and objects	1,3,5	Applying
CO-3	Apply and design the concept of transformation, aligning the objects and works with text.	1,2,3,5	Creating
CO-4	Create symbols and instances	1,3,5	Creating
CO-5	Design various animations like shape, motion tweening.	1,3,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credit						
II	21UACS2P1	FLASH PRACTICAL	30	1						
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓		✓	✓		✓		✓
CO-2	✓	✓	✓		✓	✓		✓		✓
CO-3	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO-4	✓	✓	✓		✓	✓		✓		✓
CO-5	✓	✓	✓		✓	✓		✓		✓
Number of matches (✓) = 37 Relationship = Low/Medium/ High										

Prepared by
P. Neamathul Fayed
Name and Signature

Checked by
Dr. A. Shakul Hamid
Head of the Department

Semester – III

Course Title	Java Programming
Total Hrs	60
Hrs/Week	4
Sub.Code	21UCCS31
Course Type	C V
Credits	4
Marks	100

General Objective:

Improve knowledge about basic java syntax and semantics to write programs and concepts like inheritance, packages, interface and multithreading were introduced.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Understand the fundamentals of object-oriented programming in Java, including managing classes, objects, invoking methods etc and exception handling mechanisms.
CO-2	Concepts of packages, interfaces are introduced.
CO-3	Apply the concept of multithreading and exception to avoid run time errors
CO-4	Apply applet programming for designing Web pages
CO-5	Discuss on event driven programming for developing web pages.

UNIT I Class, Objects, Inheritances, Arrays, Strings, Vectors:

Classes, Objects and methods: Defining A Class – Fields Declaration – Methods Declaration – Creating Objects – Accessing Class Members – Constructors – Methods Overloading – Static Members – Nesting Of Methods. Inheritance : Extending a Class – Overriding Methods – Final – Variables, Methods And Classes – Finalizer Methods

One-Dimensional Arrays – Creating An Array – Two-Dimensional Arrays – Strings – Vectors

UNIT II Interfaces and Packages:

Interfaces: Defining Interfaces – Extending Interfaces – Implementing Interfaces – Accessing Interface Variables.

Java API Packages – Using System Packages – Naming Conventions – Creating Packages - Accessing A Package – Using A Package – Adding Classes To A Package – Hiding Classes – Static Import.

UNIT III Multithreading and Exceptions:

Creating Threads – Extending Thread Class – Stopping And Blocking A Thread – Life Cycle Of A Thread – Using Thread Methods – Thread Exceptions – Thread Priority – Synchronization – Implementing Runnable Interface

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

UNIT IV Applet Programming

Applet Programming: How Applets Differ From Applications? – Preparing Applets – Building Applet Code – Applet Life Cycle – Creating An Executable Applet – Designing A Web Page – Applet Tag – Adding Applet To HTML File – Running Applet - More About Applet Tag - Passing Parameters To Applets – Aligning The Display – Displaying Numerical Values

UNIT V Event Handling and Graphics Programming

Getting Input from User – Event Handling

The Graphics Class – Drawing Lines, Rectangles, Circles, Ellipses, Arcs, Polygons – Line Graphs – Using Control Loops in Applets – Drawing Bar Charts – Introducing to AWT Package And Swings.

TEXT BOOK:

Programming with Java A Primer – E.Balagurusamy, McGraw Hill- Fourth Edition

Chapter:8 - 8.1 To 8.15 Chapter: 9 - 9.2 To 9.6 Chapter: 10- 10.1 To 10.5

Chapter:11 – 11.1 To 11.10 Chapter:12 – 12.1 To 12.10 Chapter:13 – 13.1 To 13.8

Chapter:14 – 14.1 To 14.17 Chapter:15 – 15.1 To 15.9

REFERENCE BOOKS:

Java2 – Complete Reference – Herbert Schildt, Tata McGraw Hill Publications

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Classify the various concepts of java programming like vectors and strings	1,3,5	Understanding
CO-2	Illustrate the concept of packages for the reuse of classes	1,3,5	Applying
CO-3	Apply Threading concept and Exceptions to avoid run time error	1,3,5	Applying
CO-4	Design WebPages using Applet programming	1,3,5	Creating
CO-5	Design Webpages using Graphics and Event Handling concepts.	1,3,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credit						
III	21UCCS31	Java Programming	4	4						
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO3	PLO4	PLO5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓		✓	✓	✓	✓		✓		✓
CO-2	✓		✓	✓	✓	✓		✓		✓
CO-3	✓		✓	✓	✓	✓		✓		✓
CO-4	✓		✓	✓	✓	✓		✓		✓
CO-5	✓		✓	✓	✓	✓		✓		✓
Number of matches (✓) = 35 Relationship = Low/Medium/ High										

Prepared by
Mrs. S. Fathima Suhara
Name and Signature

Checked by
Head of the Department

Semester – III

Course Title	Computer Graphics
Total Hrs	60
Hrs/Week	4
Sub.Code	21UCCS32
Course Type	C – VI
Credits	4
Marks	100

General Objective:

To learn fundamentals principles and algorithms of computer graphics. Understand the working of display devices and two-dimensional display concepts.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Understand the applications of graphics.
CO-2	Understand the working of video display devices.
CO-3	Apply the concept of drawing algorithms.
CO-4	Understand the concept of a two-dimensional system.
CO-5	Applications of two-dimensional clipping and understanding the concept of a three-dimensional system.

Unit – I

Application of Computer Graphics - Video display devices - Refresh Cathode Ray Tube - Color CRT Monitor - Direct View Storage Tubes - Flat Panel Displays

Unit – II

Raster Scan Systems - Random Scan Systems - Interactive Input devices - Hard copy devices - Graphics software

Unit – III

Output primitives - Line drawing algorithms: DDA Line Drawing Algorithm - Bresenham's Line Drawing Algorithm - Circle Generating Algorithm: Midpoint Circle Drawing Algorithm

Unit – IV

Two-dimensional Geometric Transformation: Basic transformations - Translation - Rotation - Scaling - Other transformations: Reflection - Shear - Matrix Representations and Homogeneous coordinates - Composite Transformation

Unit - V

Window- to view port co-ordinate transformation - Two dimensional Viewing functions - Clipping operation - Point Clipping - Line Clipping - Polygon Clipping - Curve Clipping - Text Clipping.

Textbooks:

(D.Hearn and M.P.Baker - Computer Graphics (C version) - Pearson Education.

Reference Books:

W.M. Newman and R.F.Sproull - Principles of Interactive Computer Graphics - McGraw Hill International Edition - 1979.

Course Outcomes: The learners will be able to:

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand the characteristics and functioning of common graphics input and output devices, graphics processors.	1,3	Understanding
CO-2	Apply standard graphics devices at various levels.	1,3	Applying
CO-3	Apply graphics output primitives to implement various algorithms.	1,3,5	Applying
CO-4	Apply 2D transformations to display various graphic effects including motion.	1,5	Applying
CO-5	Analyze 2D viewing and its function for handling clipping operations, classify the concept of parallel and perspective projection on 3D viewing and visible surface detection algorithms.	1,5	Analyzing

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credit						
III	21UCCS32	Computer Graphics	60	4						
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO3	PLO4	PLO5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓		✓	✓	✓	✓		✓		
CO-2	✓		✓	✓	✓	✓		✓		
CO-3	✓		✓	✓	✓	✓		✓		✓
CO-4	✓			✓	✓	✓				✓
CO-5	✓			✓	✓	✓				✓
Number of matches (✓) = 29 Relationship = Low/ Medium /High										

Prepared by
Name and Signature
M.Yogasini

Checked by
Head of the Department

Semester – III

Course Title	Web Technology
Total Hrs	60
Hrs/Week	4
Sub.Code	21UCCS33
Course Type	C VII
Credits	4
Marks	100

General Objective:

The main objective of the course is **present the basic web technology concepts that are required for developing web applications**. The key technology components are HTML,DHTML and RUBY..

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Implement the concept of HTML.
CO-2	Discuss on Tables and Lists.
CO-3	Demonstrate on DHTML and Forms.
CO-4	Discuss on basic concepts of Ruby and loops
CO-5	Demonstrate on Ruby strings and classes

UNIT I : Introduction to HTML

History of HTML – HTML documents – Anchor tag, Hyperlinks-HEAD and BODY sections – Title, Prologue, Links – Colorful Webpage-Comment Line – Designing the Body section – Aligning the headings – HR tag – Paragraphs – Images and Pictures – Embedding PNG format images.

UNIT II : Lists and Tables

Ordered and Unordered lists – Nested Lists – Headings in a list – Table Handling – Table creation in HTML – width of the table and Cells – Cell spanning – Coloring cells – Column specification

UNIT III : DHTML and Forms

DHTML and styles sheets-Defining styles-Elements of styles-Linking a style sheet to a HTML document-In-line Styles - External styles sheets-Internal Style Sheets -Multiple Styles. Forms - Action attributes-Method attribute - Enctype attribute - Check Boxes-Radio Buttons - Text Fields - Text Areas - Password-Submit and Reset Buttons - Drop down list - Sample forms.

UNIT IV : Introduction to Ruby

Introduction – Ruby features- Data types and variables – operators- Control and Looping Statements: - RUBY If Else - RUBY Case - RUBY For - RUBY While - RUBY Do While - RUBY Until - RUBY Break next - RUBY redo retry - RUBY Comments.

UNIT V : Strings and Classes

Arrays - Strings - String Methods - Classes And Objects - Ruby Methods - Ruby `Modules - Ruby Blocks.

TEXT BOOK:

1. “World Wide Web Design with HTML” by C.Xavier-2007, Tata McGraw Hill Publishing
2. “The Ruby Programming Language” by David Flanagan and Yukihiro Matsumoto, 1st Edition, 2008, O’Reilly Publications.

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Describe the concept of HTML for the purpose of designing the web pages.	13,5	Understanding
CO-2	Develop Tables for the use Table creation	1,35	Understand
CO-3	Create web pages using DHTML and Cascading Style Sheets	1,3,5	Creating
CO-4	Write object-oriented Ruby programs using classes and objects	1,3,5	Creating
CO-5	Manipulate strings using regular expressions	1,3,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course					Hours	Credit				
III	21UCCS33	Web Technology					4	4				
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)						
	PLO 1	PLO 2	PLO3	PLO4	PLO5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5		
	1	2				1	2	3	4	5		
CO-1	✓		✓	✓	✓	✓		✓		✓		
CO-2	✓		✓	✓	✓	✓		✓		✓		
CO-3	✓		✓	✓	✓	✓		✓		✓		
CO-4	✓		✓	✓	✓	✓		✓		✓		
CO-5	✓		✓	✓	✓	✓		✓		✓		
Number of matches (✓) = ...35.... Relationship = Low/Medium/ High												

Prepared by

Checked by

Mrs. S. Fathima Suhara
Name and Signature

Head of the Department

Semester – III

Course Title	Java Programming Practical
Total Hrs	60
Hrs/Week	4
Sub.Code	21UCCS3P1
Course Type	CP5
Credits	2
Marks	100

General Objective:

Develop Knowledge in programming skills and has the ability of being software developer.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Demonstrate the concepts of constructors.
CO-2	Discuss on Arrays.
CO-3	Import Packages.
CO-4	Deal with Exception.
CO-5	Demonstrate Events and Applet.

JAVA PROGRAMMING PRACTICAL

1. Program using Multiple Constructors
2. Program using different types of inheritance
3. Program using one-dimensional arrays
4. Program using Two-dimensional arrays
5. Program handling methods of Vector class
6. Program implementing interface(s)
7. Program to create and import package
8. Program to create and deal multiple threads
9. Program throwing your own exception
10. Program handling mouse events
11. Program handling keyboard events
12. Program to draw various shapes

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Write Java application programs using OOP principles and proper program structure	1,3,5	Applying
CO-2	Apply the concepts of arrays and strings in the real time applications.	1,3,5	Applying
CO-3	Develop packages	1,3,5	Applying
CO-4	Write Java programs to implement error handling techniques using exception handling	1,3,5	Creating
CO-5	Develop Webpages using Applet programming	1,3,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course					Hours	Credit		
III	21UCCS3P1	Java Programming Practical					4	2		
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓		✓	✓	✓	✓		✓		✓
CO-2	✓		✓	✓	✓	✓		✓		✓
CO-3	✓		✓	✓	✓	✓		✓		✓
CO-4	✓		✓	✓	✓	✓		✓		✓
CO-5	✓		✓	✓	✓	✓		✓		✓
Number of matches (✓) = 35 Relationship = Low/Medium/ High										

Prepared by

Checked by

Mrs. S. Fathima Suhara

Name and Signature

Head of the Department

Semester – III

Course Title	Web Technology Practical
Total Hrs	30
Hrs/Week	2
Sub.Code	21UCCS3P2
Course Type	CP IV
Credits	1
Marks	50

General Objective:

The main objective of the course is **present the basic web technology concepts that are required for developing web applications**. The key technology components are descriptive languages, server side program elements and client side program elements.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Illustrate Hyperlink.
CO-2	Implement lists.
CO-3	Develop registration form using controls.
CO-4	Demonstrate on Ruby operators.
CO-5	Discuss on Ruby strings and classes and objects.

WEB TECHNOLOGY PRACTICAL

1. Write a HTML Program using Hyperlink
2. Write a HTML Program to insert an image
3. Write a HTML Program using Nested List
4. Write a HTML Program create a Timetable
5. Write a HTML Program using Inline Styles
6. Create a Registration Form using form controls
7. Write a Ruby Program using Operators
8. Write a Ruby Program using redo retry
9. Write a Ruby Program using While Statement
10. Write a Ruby Program using Strings
11. Write a Ruby Program using Classes and Objects
12. Write a Ruby Program using Modules

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Apply Hyperlink for web pages.	1,3,5	Applying
CO-2	Develop list for the purpose of designing	1,3,5	Applying
CO-3	Develop web pages using form controls	1,3,5	Applying
CO-4	Develop our own web applications using Ruby operators.	1,3,5	Applying
CO-5	Apply the concepts of arrays and strings in the real time applications.	1,3, 5	Applying

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credit						
III	21UCCS3P2	Web Technology Practical	2	1						
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO3	PLO4	PLO5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓		✓	✓	✓		✓		✓
CO-2	✓	✓		✓	✓	✓		✓		✓
CO-3	✓	✓		✓	✓	✓		✓		✓
CO-4	✓	✓		✓	✓	✓		✓		✓
CO-5	✓	✓		✓	✓	✓		✓		✓
Number of matches (✓) = 35 Relationship = Low/Medium/ High										

Prepared by

Name and Signature

Mrs. S. Fathima Suhara

Head of the Department

Semester – III

Course Title	UNIX AND SHELL PROGRAMMING
Total Hrs	60
Hrs/Week	4
Sub.Code	21UACS31
Course Type	A-II/1
Credits	3
Marks	100

General Objective:

Understand the Architecture, design and basic structure of the UNIX operating system and implement various basic UNIX commands and expose to a minimum of one text editor in UNIX.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Understanding the concepts of theoretical and practical study of the UNIX operating system.
CO-2	Construct UNIX commands to manipulate files and directories..
CO-3	Experiment the shell programs by using the editor vi extensively.
CO-4	Justify UNIX by changing passwords, profiles.
CO-5	Design and Learn Life cycle of processes and to understand the usage of UNIX inter process communications (IPC) and Develop their own shell programs by using built-in and user-defined shell variables.

UNIT I

History of Unix – Features of Unix – Architecture of Unix – File system – Metacharacters - Commands –cat,ls,ls-l,cal,who,mkdir,rmdir - Creating files – Redirecting input and output – Pipelines – Appending output to your files.

UNIT II

Personalized Unix – Changing Password – Login Profiles – Own login profile – Permissions – Changing owner, groups and others permission – Processes – background & foreground process – Killing process – Process status command – Multi line commands – Sleep.

UNIT III

Vi editor – Creating Text – Editing text – EX command mode – Shell within Vi – Printing and spooling – Simple formatting with pr.

Unit IV

Sort – Head – Tail – Split – Cut – Paste – Find – tr – dd – grep family – awk.

UNIT V

Shell Programming – Shell Scripting Steps Simple Shell Program – Shell and sub shell variables – Setting and unsetting variables – Positional parameters– Loops – test – read.

TEXT BOOK :

UNIX Concepts and Applications by Sumitabha Das –Tata McGraw Pub. Company Ltd 3rd Edition.

REFERENCE BOOK :

UNIX Complete by Peter Dyson, Stan Kelly – Bootle and John Heilbern.

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand the theoretical concepts and Architecture of the OS.	1,2,5	Understanding
CO-2	Apply the concepts of various utilities and commands in Unix environment.	1,2,5	Applying
CO-3	Evaluate and Apply UNIX utilities for simple file processing operations, organize directory structures with appropriate security.	2,5	Analyzing
CO-4	Predict the use of UNIX pipes and redirection, filter commands, filter options, and Regular Expressions..	2,5	Evaluating
CO-5	Create vi editors commands and enter scripts for shell programming and navigate throughout the text and perform different tasks.	1,2,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credit						
III	21UACS31	UNIX AND SHELL PROGRAMMING	4	3						
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓	✓	✓	✓	✓			✓
CO-2	✓	✓	✓	✓	✓	✓	✓			✓
CO-3	✓	✓		✓	✓		✓			✓
CO-4	✓	✓		✓	✓		✓			✓
CO-5	✓	✓	✓	✓	✓	✓	✓			✓
Number of matches (✓) = 36 Relationship = Low/Medium/ High										

Prepared by
Name and Signature
S.M.A.Khaleelur Rahman

Checked by
Head of the Department
Dr. A.Shakul Hamid

Semester – III

Course Title	UNIX AND SHELL PROGRAMMING PRACTICAL
Total Hrs	30
Hrs/Week	2
Sub.Code	21UACS3P1
Course Type	A-II/1P
Credits	1
Marks	100

General Objective:

Understand the Architecture, design and basic structure of the UNIX operating system and implement various basic UNIX commands and expose to a minimum of one text editor in UNIX.

. Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Discuss with login ,logout ,simple commands, utilities and changing passwords.
CO-2	Construct the file and directory access and permissions.
CO-3	Classify vi editor commands .
CO-4	Justify the knowledge of pipes, redirection and filter operations.
CO-5	Design and develop simple and logical shell programs by using shell scripts and different loop and control statement in shell programming.

1. Program for finding factorial.
2. Program for generating Multiplication Table.
3. Finding Simple Interest.
4. Leap year checking.
5. Fibonacci Series.
6. Over time pay calculation.
7. Check whether a given number is an Armstrong number or not.
8. Check whether a given number is Prime or not.
9. i) Checking file access permission.
ii) Creating, moving, copying, and removing files using Command.
10. i) Creating, changing and removing directory using Command.
ii) Granting and revoking permissions for user, groups and others.
11. Program using Loops.

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand and familiarize with login, logout and passwords procedures.	1,2,3,5	Understanding
CO-2	Construct and implement simple commands and utilities.	1,2,3,5	Applying
CO-3	Develop and changing permissions of files/directories to groups and individuals.	1,3,5	Applying
CO-4	Classify vi editor commands .	1,3,5	Analyzing
CO-5	Create skills by implementing pipes, filters and redirection and Write/enter and execute shell programs by using user-defined, system variables ,loops, and various control statements.	1,3,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credit						
IV	21UACS3P1	UNIX AND SHELL PROGRAMMING PRACTICAL	2	2						
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO3	PLO4	PLO5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓		✓	✓	✓	✓		✓
CO-2	✓	✓	✓		✓	✓	✓	✓		✓
CO-3	✓	✓	✓		✓	✓		✓		✓
CO-4	✓	✓	✓		✓	✓		✓		✓
CO-5	✓	✓	✓		✓	✓		✓		✓
Number of matches (✓) =37 Relationship = Low/Medium/ High										

Prepared by

Checked by

Name and Signature

Head of the Department

S.M.A.Khaleelur Rahman

Dr. A.Shakul Hamid

Semester – III

Course Title	Operation Research
Total Hrs	30
Hrs/Week	2
Sub.Code	21UECS31
Course Type	SEC – I
Credits	2
Marks	100

General Objective:

Establish mathematical model for business domain and solve mathematical optimization problems that translate to industrial decision making problems.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Understand the concept of decision making problem in mathematical model.
CO-2	Distinguish the strategies of different type of game.
CO-3	Solve the problem of consumer and producer in business domain and also Solve the mortality staffing problem.
CO-4	Estimate the time scheduling process in real time project.
CO-5	Evaluate the Queuing process in ticket reservation.

Unit – I **Simplex Method:**

Different forms of Linear Programming Problem – Basic solution, Degenerate solution, Non-Degenerate solution, Basic feasible solution, Improved BFS, Optimum BFS – Slack, Surplus - Bounded and Unbounded solution.

Unit – II **Theory of Games:**

Introduction – payoff matrix, fair game, strictly determinable game – Two person zero sum games – The Maximin Minimax principle of game theory – Games without saddle points – Mixed strategies.

Unit – III **Replacement Problem:**

Introduction – Replacement of items that Deteriorate with time –Replacement of Items whose Maintenance costs increase with time and the value of money also changes with time – Mortality and Staffing problem.

Unit– IV **Network Scheduling:**

Introduction – Basic concepts: Activities, Nodes, Network, Critical path – Constraints in Networks – Construction of the Network.

Unit – V **Queuing Theory:**

Introduction – Characteristics of queuing systems – Basic queuing process – Customer’s behaviors in the queue – Postulate for the Poisson process – Distribution of arrival time – Distribution of service time – Symbols and Notations – Classification of Queues – Basic characteristic of model one.

Textbooks:

Operations Research – P.K.Gupta, Kanti Swarup and Man Mohan, Sultan Chand & Sons Publications.

Reference Books:

1. Operations Research – J.A. Mangaladoss, Presi – Persi Publications
2. Operations Research – R.Paneer Selvam, Prentice Hall of India .

Course Outcomes

Course Outcomes: The learners will be able to:

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Identify the mathematical optimization problem and use in real time business domain.	1,5	Understanding
CO-2	Understand the strategic actions of a game.	1,5	Understanding
CO-3	Illustrate the problem in business domain and human resource recruitment domain.	1,2,5	Applying
CO-4	Estimate the level of network scheduling task.	1,4,5	Analyzing
CO-5	Evaluate the concept of queuing model in real time process.	1,4,5	Evaluating

Relationship Matrix

Semester	Course Code	Title of the Course					Hours	Credit		
III	21UECS31	Operation Research					2	2		
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO3	PLO4	PLO5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓			✓	✓	✓				✓
CO-2	✓			✓	✓	✓				✓
CO-3	✓	✓	✓	✓	✓	✓	✓			✓
CO-4	✓	✓		✓	✓	✓			✓	✓
CO-5	✓	✓		✓	✓	✓			✓	✓
Number of matches (✓) =32 Relationship = Low/ Medium /High										

Prepared by
Name and Signature

Checked by
Head of the Department

Semester – III

Course Title	OFFICE AUTOMATION
Total Hrs	30
Hrs/Week	2
Sub.Code	21UNCS31
Course Type	NME-I
Credits	2
Marks	100

General Objective:

The backbone of office automation is a LAN, which allows users to transfer data, mail and even voice across the network and including dictation, typing, filing, copying, fax, Telex, microfilm and all office functions, Records management, telephone and telephone switchboard operations, fall into this category.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Understand the concept of manipulation of relay office information needed for accomplishing basic tasks.
CO-2	Apply the concept of mail merge.
CO-3	Analyze business productivity and optimize existing office procedure which saves time.
CO-4	Create and Edit spreadsheet document and files and images.

CO-5	Design and create the concept of validation and goal seek and skills in enhancing the PowerPoint slides with animation and sound effects.
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UNIT I Documentation Using MS-Word:

Introduction to Office Automation, Creating & Editing Document, Formatting Document, Page Formatting, Bookmark.

UNIT II Advance MS-Word:

Advance Features of MS-Word [Mail Merge], Tables, File Management, Printing, Styles.

UNIT III Electronic Spread Sheet using MS-Excel:

Introduction to MS-Excel, Creating & Editing Worksheet, Formulas and Functions, Charts.

UNIT IV Advance features of MS- Excel:

Formatting and Essential Operations, Data Sorting, Filtering data in worksheet, Validation, Goal Seek.

UNIT V Presentation Using MS-PowerPoint:

Presentations, Creating Slides, Manipulating & Enhancing Slides, Custom Animation.

TEXT BOOK:

Microsoft Office – Complete Reference – BPB Publication

REFERENCE BOOK:

Learn Microsoft Office – Russell A. Stultz – BPB Publication.

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand the concept of manipulation of relay office information needed for accomplishing basic tasks.	1,2	Understanding
CO-2	Apply the concept of mail merge.	2,3,5	Applying
CO-3	Analyze business productivity and optimize existing office procedure which saves time.	2,3,5	Analyzing
CO-4	Create and Edit spreadsheet document and files and images.	1,2,3,5	Creating
CO-5	Design and create the concept of validation and goal seek and skills in enhancing the PowerPoint slides with animation and sound effects.	1,3,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credit						
III	21UNCS31	OFFICE AUTOMATION	30	2						
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓		✓	✓	✓	✓			
CO-2	✓	✓	✓	✓	✓		✓	✓		✓
CO-3	✓	✓	✓	✓	✓		✓	✓		✓
CO-4	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO-5	✓	✓	✓	✓	✓	✓		✓		✓
Number of matches (✓) = 39 Relationship = Low/Medium/ High										

Prepared by
V. Uma Devi
Name and Signature

Checked by
Dr. A. Shakul Hamid
Head of the Department

Semester – IV

Course Title	Operating Systems
Total Hrs	60
Hrs/Week	4
Sub.Code	21UCCS41
Course Type	C-VIII
Credits	4
Marks	100

General Objective:

Students can able to learn the basics of different operating systems and learn about CPU scheduling – different scheduling algorithms. Acquire knowledge about File management, Directories Disk management I/O.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Understand the basic concepts of Operating Systems.
CO-2	Understand different views of operating systems, Mutual exclusion and deadlock.
CO-3	Learn CPU scheduling and algorithms.
CO-4	Understand basic of memory management, paging concepts.
CO-5	Learn file management and disk management and paging algorithms.

Unit – I

Introduction of Operating Systems(OSs). Evolution of OSs – Serial processing – Batch processing – Multiprogramming . Types of OSs – Batch OSs - Multiprogramming OSs – Time-sharing OSs – Real-time OSs – Combination OSs – Distributed OSs

Unit – II

What is process. Implicit and Explicit Tasking – Process relationship. System programmer’s view of processes – Interprocess synchronization. OS’s view of processes – Operating System’s view of Processes- Threads- Process Control Block (PCB)

Unit – III

CPU Scheduling: Types of Schedulers – Long-term Scheduler – Medium-term Scheduler – Short-term Scheduler. Scheduling and Performance Criteria. Scheduler Design. Scheduling Algorithms – First-Come, First-Served (FCFS) Scheduling – Shortest Remaining Time Next (SRTN) Scheduling – Time-Slice (Round-Robin (RR)) Scheduling – Priority-Based Preemptive(Event-Driven(ED)) Scheduling – Multiple-Level Queue(MLQ) Scheduling .

Unit – IV

What is Mutual Exclusion? - Deadlocks - Introduction to deadlocks - Reusable and Consumable Resources- Deadlock Prevention – Deadlock Avoidance – Banker’s Algorithm - Resource Request- Resource Release- Deadlock Detection and Recovery- Combined Approach.

Unit - V

Memory management: Basics of memory management – Single-process Monitor. Segmentation - Static Partitioned Memory Management - Principles of operation -Swapping- Relocation- Static Relocation - Dynamic Relocation- Protection- Sharing. Dynamic Partitioned Memory Management – Principles of Operation – Compaction - Protection- Sharing. What is segmentation. What is Paging – What is Virtual memory – Page replacement policies – FIFO – LRU. File Management – Introduction to Hierarchical file system and Directories

Textbooks:

Operating Systems By Milan Milenkovic, Tata McGRAW-HILL Edition

Unit I: Chapter: 1.1 , 1.1.1, 1.1.2, 1.1.3, 1.2, 1.2.1, 1.2.2, 1.2.3

Unit II: Chapter: 2.1, 2.1.1, 2.1.2, 2.2, 2.2.2, 2.3.1, 2.3.5

Unit III: Chapter: 2.5, 2.5.1, 2.5.2, 2.5.3, 2.5.3, 2.6, 2.6.1, 2.6.2, 2.6.3, 2.6.4, 2.6.5

Unit IV: Chapter: 3.2, 4.5, 4.5.1, 4.5.2, 4.5.3, 4.5.4, 4.5.5

Unit V: Chapter: 5.1, 5.2, 5.2.1, 5.2.2, 5.2.3, 5.2.4, 5.2.5, 5.3, 5.3.1, 5.3.2, 5.3.3, 5.3.4, 5.4, 6.1, 6.2, 6.2.5, 7.1

Reference Books:

Operating Systems By Stuart E Madnic and John J Donovan, McGraw Hill Publications

Course Outcomes: The learners will be able to:

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand different views of operating system and its types.	1,5	Understanding
CO-2	Explain about threads, mutual exclusion and deadlock. CPU Scheduling.	1,5	Understanding
CO-3	Illustrate CPU scheduling and its types. file management and Unix process management.	1,5	Applying
CO-4	Evaluate Mutual Exclusion, Deadlock OS.	1,5	Analyzing
CO-5	Evaluate basis of memory management, static, dynamic partition and page replacement algorithms.	1,5	Evaluating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credit						
IV	21UCCS41	Operating Systems	60	4						
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓			✓	✓	✓				✓
CO-2	✓			✓	✓	✓				✓
CO-3	✓			✓	✓	✓				✓
CO-4	✓			✓	✓	✓				✓
CO-5	✓			✓	✓	✓				✓
Number of matches (✓) = 25 Relationship = Low/ Medium /High										

Prepared by
Name and Signature
M.Yogasini

Checked by
Head of the Department

Semester – IV

Course Title	Active Server Page
Total Hrs	60
Hrs/Week	4
Sub.Code	21UCCS42
Course Type	C IX
Credits	4
Marks	100

General Objective:

To create dynamic Web pages by using ASP. Design and develop programs with GUI interfaces.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Demonstrate the basic concept of ASP.
CO-2	Discuss the concept of components.
CO-3	Illustrate the concepts of forms.
CO-4	Implement the concept of cookies.
CO-5	Discuss on Files.

UNIT I

Introduction: What is ASP? – ASP Model – The Process of Serving an Active Sever Page – Understanding Objects – Application Object – Request Object – Response Object – Server Object – Session Object.

UNIT II

Components: The Advertisement Rotator Component – The Browser Capabilities Component – The TextStream Component – The Input Box Function – The MsgBox Function.

Unit III

Working with Html: Retrieving Form Data – Using Text Boxes and Text Areas – Using Radio Buttons and Check boxes – Using Select Lists – Validating Form Data.

UNIT IV

Cookies: Working with Cookies – Application of Cookies – Drawbacks of using Cookies – Using Cookies in ASP Applications – Working with Files and the File System – Working with Drives and Folders.

UNIT V

Connections and Data Sources: connecting to a Microsoft Access Database – Connection Object – Working with Record Sets – Recordset Cursor and Locking Types.

TEXT BOOK

Ivan Bayross, 'Practical ASP',BBP Publications

REFERENCE BOOK:

“Special Edition Using Active Server Pages” – Scot Johnson, Keith Balliger, Davis Howard Chapman

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Apply the basic concept of ASP and develop web pages.	1,3,5	Applying
CO-2	Develop Components for client server programming	1,3,5	Applying
CO-3	Develop forms for web pages.	1,3,5	Applying
CO-4	Design Web pages using cookies	1,3,5	Creating
CO-5	Develop Files and demonstrate data sources.	1,3,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credit						
IV	21UCCS42	Active Server Pages	4	4						
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO3	PLO4	PLO5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓		✓	✓	✓		✓		✓
CO-2	✓	✓		✓	✓	✓		✓		✓
CO-3	✓	✓		✓	✓	✓		✓		✓
CO-4	✓	✓		✓	✓	✓		✓		✓
CO-5	✓	✓		✓	✓	✓		✓		✓
Number of matches (✓) = 35 Relationship = Low/Medium/ High										

Prepared by
Mrs. Fathima Suhara

Checked by

Name and Signature

Head of the Department

Semester – IV

Course Title	PHP
Total Hrs	60
Hrs/Week	4
Sub.Code	21UCCS43
Course Type	C X
Credits	4
Marks	100

General Objective:

To understand the use of Internet communication, resource discovery, research, and dissemination of information in multimedia formats and gain skills in the Web page development using current Web technologies.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Observe the web design concept of PHP.
CO-2	Classify arrays and functions.
CO-3	Apply the concepts of classes and objects in PHP.
CO-4	Develop a dynamic web page with server side script.
CO-5	Manage the web page using database domain

Unit – I Introduction to PHP:

Writing and running the PHP script - Assigning Values to Variable-Destroying and inspecting Variable Content - PHP Data Types - Control Structures: if, if else,if elseif..else, for,foreach, do-while, while, break, continue, switch.

UNIT-II ARRAY:

Indexed and Associative Array, Creating Arrays, Accessing Array Elements, Multidimensional Array. Functions: User-Defined Function, Recursive Function. String & Date-Time: Creating & Accessing String, String Manipulation using string functions, Date-Time: Understanding Timestamp, Getting current date & time

UNIT III Classes and Objects:

Introduction to OOPS Concepts, Visibility Controls, Creating Class and Object, Overloading, Constructor, Destructor, Object Inheritance.

UNIT IV Web-Form Handling FORM with PHP:

Capturing form Data with PHP, Dealing with Multi-value Fields, Generating Web Forms, Storing Variable in Forms, Upload Forms, Redirecting form submission - PHP Session to store data.

UNIT V Database Connectivity & SQL:

Creating Database - Adding Tables - Adding Records - Modifying and removing Records - Retrieving Data

TEXT BOOK:

PHP A beginner's Guide-Vikram Vaswani-Tata Mc Graw Hill

REFERENCE BOOK:

” Beginning PHP and MySQL” W. Jason Gilmore, Kindle Edition

Course Outcomes

Course Outcomes: The learners will be able to:

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand the usage of basic structure of PHP script in web design.	1,3,5	Understanding
CO-2	Apply the concepts of arrays and functions in dynamic web page.	1,3,5	Applying
CO-3	Determine Object-Oriented Design principles in PHP.	1,3,5	Applying
CO-4	Develop the skills of web design Technologies.	1,3,5	Creating
CO-5	Integrate the concept of Database in dynamic web application.	1,3,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course					Hours	Credit		
IV	21UCCS43	PHP					4	4		
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO3	PLO4	PLO5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
	✓		✓	✓	✓	✓		✓		✓
CO-1	✓		✓	✓	✓	✓		✓		✓
CO-2	✓		✓	✓	✓	✓		✓		✓
CO-3	✓		✓	✓	✓	✓		✓		✓
CO-4	✓		✓	✓	✓	✓		✓		✓
CO-5	✓		✓	✓	✓	✓		✓		✓
Number of matches (✓) = 35 Relationship = Low/Medium/ High										

Prepared by
Name and Signature
D.M.Annie Brighty Christilin

Checked by
Head of the Department
J.Jannathul Firthous

Semester – IV

Course Title	PHP PRACTICAL
Total Hrs	60
Hrs/Week	4
Sub.Code	21UCCS4P1
Course Type	CP V
Credits	2
Marks	100

General Objective:

To develop the dynamic web page with resource discovery and dissemination of information in multimedia formats using current web technologies.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Apply the skills in the web design concept of PHP.
CO-2	Analyze the server side scripting language.
CO-3	Evaluate dynamic function.
CO-4	Apply the inheritance concept in data view.
CO-5	Design a dynamic web page with server side script using database concept.

PHP PRACTICAL

1. Write a PHP program to display the Fibonacci series
2. Write a PHP program to display the sum of the given number using function.
3. Write a PHP program for demonstration of string functions.
4. Write a PHP program that will use the concept form.
5. Write a PHP program for demonstrating an Indexed Array.
6. Write a PHP program for demonstrating an Associative Array.
7. Write a PHP program to prepare student Mark sheet using switch statement.
8. Write a PHP program using Multilevel Inheritance.
9. Write a PHP program to connect to database.
10. Write a PHP program to insert and retrieve data using database.

Course Outcomes

Course Outcomes: The learners will be able to:

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Apply the concept of writing PHP script in dynamic web page.	1,3,5	Applying
CO-2	Establish the concept of arrays and functions in PHP.	1,3,5	Applying
CO-3	Manipulate the strings in PHP.	1,3,5	Applying
CO-4	Distinguish the different types of inheritance in PHP.	1,3,5	Evaluating
CO-5	Integrate the concept of database with PHP script.	1,3,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credit						
IV	21UCCS4P1	PHP Practical	4	2						
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓		✓	✓	✓	✓		✓		✓
CO-2	✓		✓	✓	✓	✓		✓		✓
CO-3	✓		✓	✓	✓	✓		✓		✓
CO-4	✓		✓	✓	✓	✓		✓		✓
CO-5	✓		✓	✓	✓	✓		✓		✓
	Number of matches (✓) =35 Relationship = Low/Medium/ High									

Prepared by

Name and Signature
D.M.Annie Brighty Christilin

Checked by

Head of the Department
J.Jannathul Firthous

Semester – IV

Course Title	Active Server Pages Practical
Total Hrs	30
Hrs/Week	2
Sub.Code	21UECS4P2
Course Type	CP VI
Credits	1
Marks	50

General Objective:

1. Designed to produce dynamic web pages.
2. Configure on asp application.
3. Connecting to data sources and managing them.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Demonstration of Cookies.
CO-2	Demonstration of Query string.
CO-3	Discuss Application concept for web developing.
CO-4	Discuss on Files.
CO-5	Demonstration on Drives and Folders.

ACTIVE SERVER PAGES PRACTICAL

1. Demonstration of Cookies.
2. Write an ASP program to store username and password into session.
3. Demonstration of Query String.
4. Write a ASP program to count the number of visitors for the particular web Page.
5. Write a ASP program to copy the contents of file into another file.
6. Write a ASP program to move and delete the specified file.
7. Demonstration of Drives.
8. Demonstration of Folder.

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Develop Web pages using Cookies	1,3,5	Applying
CO-2	Write programs on Querystring.	1,3,5	Applying
CO-3	Write programs on Application concept.	1,3,5	Applying
CO-4	Discuss on Files and retrieve the data	1,3,5	Applying
CO-5	Write programs on Drives and folders.	1,3,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course					Hours	Credit		
IV	21UECS4P2	Active Server Pages Practical					2	1		
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓		✓	✓	✓	✓		✓		✓
CO-2	✓		✓	✓	✓	✓		✓		✓
CO-3	✓		✓	✓	✓	✓		✓		✓
CO-4	✓		✓	✓	✓	✓		✓		✓
CO-5	✓		✓	✓	✓	✓		✓		✓
Number of matches (✓) = 35										
Relationship = Low/Medium/ High										

Prepared by

Checked by

Mrs. S. Fathima Suhara
Name and Signature

Head of the Department

Semester – IV

Course Title	Python Programming
Total Hrs	60
Hrs/Week	4
Sub.Code	21UACS41
Course Type	A-II/2
Credits	3
Marks	100

General Objective:

Designed to provide Basic knowledge of Python. Python programming is intended for software engineers, system analysts, program managers and user support personnel who wish to learn the Python programming language.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Explain basic principles of Python programming language
CO-2	Demonstrate on Python Strings.
CO-3	Discuss Tuples and Dictionary.
CO-4	To create Modules and used in real time applications.

CO-5	Implement Packages and explore Exception handling.
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UNIT I:

About Python – Features of Python – Python Setup – Fundamentals of Python – Values and Datatype – Variables – Identifiers – Comments – Input /Output and Import Functions – Expressions – Statements – Operators – Mathematical Functions – Random Number Functions – Trigonometric Functions – Advantages of Python – Disadvantages of Python – Conditional Statements – Looping Statements

UNIT II:

FUNCTIONS: Defining a Function – Function Call – Types of Functions – Python Function Arguments – Composition – Python Recursion – Python Anonymous and Lambda Function – Function with more than one return value – STRINGS: Initializing the String variable – Accessing String variable – Slicing Strings – String Concatenation – Repeating a String – Escape Sequences – Format method – String Functions and Methods.

UNIT III:

COMPOUND DATA: List – Tuples – Mappings – Dictionary: Creating a Dictionary – Accessing elements on a dictionary – Adding and Modifying Entries to a dictionary – Removing or Deleting Elements from a Dictionary – Python Dictionary Methods – Using Built – In Functions with Dictionary – Mutable and Immutable Objects – Data Type Conversion – List Comprehension

UNIT IV:

MODULES AND PACKAGES : Creating Modules – Importing Modules – Built – In Modules: Math Module – Random Functions – Date and Time - Locating Modules – Namespaces and Scope – Dir() Function – Reload() Function – Packages in Python

UNIT V:

EXCEPTION HANDLING: Built – In Exception – Handling Exception: Try...Except – Except Clause with No Exceptions – Except Clause with Multiple Exceptions – Try... Finally Clause – Exception with Arguments- Raising an Exception – User Defined Exception

TEXT BOOK:

Problem Solving and Python Programming – Dr. A. Kannan, Dr. L. Sai Ramesh, United Global Publishers Pvt. Ltd.

REFERENCE BOOK:

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Discuss the basic concepts of Python.	1,3,5	Applying
CO-2	Apply the concepts of arrays and strings in the real time applications.	1,3,5	Applying
CO-3	Discuss Tuples and Dictionary	1,3,5	Understanding
CO-4	Create modules and implement in import in various places	1,3,5	Creating
CO-5	Write python programs to implement error handling techniques using exception handling	1,3,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credit						
IV	21UACS41	Python Programming	4	3						
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO3	PLO4	PLO5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓		✓	✓	✓	✓		✓		✓
CO-2	✓		✓	✓	✓	✓		✓		✓
CO-3	✓		✓	✓	✓	✓		✓		✓
CO-4	✓		✓	✓	✓	✓		✓		✓
CO-5	✓		✓	✓	✓	✓		✓		✓

	Number of matches (✓) = 35 Relationship = Low/Medium/ High
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Prepared by
 Mrs. J. Jannathul Firthous
 Name and Signature

Checked by

 Head of the Department

Semester – IV

Course Title	Python Practical
Total Hrs	30
Hrs/Week	2
Sub.Code	21UACS4P1
Course Type	A-II/2P
Credits	1
Marks	50

General Objective:

Learn and understand Python programming basics and paradigm. To learn and understand python looping, control statements and string manipulations.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Develop Functions and use it in various applications.
CO-2	Discuss on Conditionals and Loops for Python Programs.
CO-3	Develop user defined function with pre defined functions.
CO-4	Discuss functions and represent Compound data using Lists, Tuples and Dictionaries

CO-5	Python programs to implement error handling techniques using exception handling
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PYTHON PROGRAMMING PRACTICAL

1. Program using Mathematical Functions.
2. Program using Conditional statements.
3. Program using Looping Statements.
4. Program using Continue, Pass and Break Statement.
5. Program using Recursive Function
6. Program to demonstrate String Manipulation.
7. Program using lists.
8. Program using tuples.
9. Program using dictionary.
10. Program using Modules.
11. Program using Packages.
12. Program to demonstrate Exception handling.

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Write, Test and Debug Python Programs	1,3,5	Applying
CO-2	Develop python programs using conditional loops and statements	1,3,5	Applying
CO-3	Create function using pre defined function.	1,3,5	Creating
CO-4	Write Python Programming to explore string functions.	1,3,5	Creating
CO-5	Write Python programs to implement error handling techniques using exception handling	1,3,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course					Hours	Credit		
IV	21UACS4P1	Python Programming Practical					2	1		
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓		✓	✓	✓	✓		✓		✓
CO-2	✓		✓	✓	✓	✓		✓		✓
CO-3	✓		✓	✓	✓	✓		✓		✓
CO-4	✓		✓	✓	✓	✓		✓		✓
CO-5	✓		✓	✓	✓	✓		✓		✓
Number of matches (✓) = 35 Relationship = Low/Medium/ High										

Prepared by
Mrs. J. Jannathul Firthous
Name and Signature

Checked by
Head of the Department

Semester – IV

Course Title	Data Structures in C
Total Hrs	30
Hrs/Week	2
Sub.Code	21UECS42
Course Type	SEC-IV
Credits	2
Marks	100

General Objective:

Understand the usage of tools and features and to build the ability in choosing appropriate type of data structure in the language.

Course Objectives: The learners will be able to::

CO	Course Objectives
CO-1	Understand the basic concepts of Data Structures.
CO-2	Classify arrays and structures.
CO-3	Apply the concepts of stacks and queues.
CO-4	Explain the concept of functions on linked lists.
CO-5	Design the concepts of trees and binary trees and graphs.

UNIT I Arrays and Structures:

Arrays – Dynamically Allocated Arrays- Structures and Unions – Polynomials – adding polynomials – Sparse Matrices: **The abstract data types, sparse matrix representation**, transpose a sparse matrix – Representation of Multidimensional Arrays – Strings.

UNIT II Stacks And Queues:

Stacks – Abstract data type stack – add, delete elements from stack – Queues – Abstract data type queue – add, delete elements from queue – Circular Queues – **Evaluation of expressions – Evaluating postfix expressions – infix to postfix.**

UNIT III Linked Lists:

Singly linked lists and Chains – Representing chains in C – create a two – node list – insert an element in a list – delete an element from a list – display the elements in a list – add and delete an element using linked stack and queue – **polynomial representation using linked list – adding polynomials – doubly linked list – add and delete an element using doubly linked list.**

UNIT IV Trees:

Terminology – Representation of trees – binary trees: abstract data type – properties of binary trees – Binary tree representations – binary tree traversals – in order, pre-order and post order traversal – **additional binary tree operations: copying and testing equality.**

UNIT V Graphs:

Abstract data type – Definitions – Graph Representations – **Adjacency Matrix, Adjacency Lists, Adjacency Multi-lists** – Spanning trees – Minimum cost spanning trees – **Kruskal’s Algorithm, Prim’s Algorithm – Transitive closure**

TEXT BOOK:

Horowitz, Sahni and Anderson-Freed - Fundamentals of Data Structures in C, Second edition, University Press (India) private limited.

REFERENCE BOOKS:

Ellis Horowitz and Sartaj Sahni, Fundamentals of Data Structures, Galgotia Publications.

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understanding the concepts of Arrays and structures.	1,5	Understanding
CO-2	Apply the concepts of Stacks and Queues.	1,5	Applying
CO-3	Construct Linked lists.	1,5	Applying
CO-4	Compare trees and Binary trees.	1,5	Analyzing
CO-5	Explain the concepts of spanning tree and Graphs.	1,5	Analyzing

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credit						
IV	21UECS42	Data Structures in C	2	2						
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓		✓	✓				✓
CO-2	✓	✓	✓		✓	✓				✓
CO-3	✓	✓	✓		✓	✓				✓
CO-4	✓	✓	✓		✓	✓				✓
CO-5	✓	✓	✓		✓	✓				✓
Number of matches (✓) = 30 Relationship = Low/ Medium /High										

Prepared by
Mr. K.A.Ameer Hamsha
Name and Signature

Checked by
Dr. A. Shakul Hamid
Head of the Department

Semester – IV

Course Title	WEB DESIGN
Total Hrs	30
Hrs/Week	2
Sub.Code	21UNCS41
Course Type	NME- 2
Credits	2
Marks	100

General Objective:

Introduction of web-development techniques that use HTML and adding new information, establishing trust, marketing your site on other websites and social media and improve interaction with existing and potential customers.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Understand the concept of HTML
CO-2	Apply the concept of Tags
CO-3	Apply the concept of Lists in HTML
CO-4	Apply the concept of Tables.
CO-5	Analyze the concept of Frames and apply the concept of FORMS in HTML

UNIT I Introduction to HTML :

History of HTML – HTML documents – Head Section - Title, Prologue, Links - Colorful Webpage-Comment Lines

UNIT II Designing the Body Section:

Heading Printing – Aligning the headings – HR tag – Anchor tag – Paragraphs – Images and Pictures – Embedding PNG format images.

UNIT III Lists and Tables :

Ordered and Unordered lists – Nested Lists – Headings in a list – Table Handling – Table creation in HTML – width of the table and Cells – Cell spanning – Coloring cells – Column specification

UNIT-IV Frames:

Frames – Frameset definitions – Frame definitions – Nested framesets

UNIT-V Forms :

Forms – Action attributes – Method attribute – Enctype attribute – Check Boxes –Radio Buttons – Text Fields – Text Areas – Password – Submit and Reset Buttons – Drop down list – Sample forms.

TEXT BOOKS:

1. World Wide Web Design with HTML, Dr.C.Xavier., Tata McGraw – Hill Publishing Company.
2. Web design. A complete reference, Pouuell, Tata McGraw Hill Publishing Company

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand the concept of HTML	1,2,5	Understanding
CO-2	Apply the concept of Tags	1,2	Applying
CO-3	Apply the concept of Lists in HTML	1,2,3	Applying
CO-4	Apply the concept of Tables.	1,2,3	Applying
CO-5	Analyze the concept of Frames and apply the concept of FORMS in HTML	1,3,5	Analyzing

Relationship Matrix

Semester	Course Code	Title of the Course					Hours	CreditS				
IV	21UNCS41	WEB DESIGN					30	2				
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)						
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5		
CO-1	✓	✓			✓	✓	✓			✓		
CO-2	✓	✓			✓	✓	✓					
CO-3	✓	✓	✓		✓	✓	✓	✓				
CO-4	✓	✓	✓		✓	✓	✓	✓				
CO-5	✓	✓	✓		✓	✓		✓		✓		
Number of matches (✓) = 31 Relationship = Low/ Medium /High												

Prepared by
V. Uma Devi
Name and Signature

Checked by
Dr. A. Shakul Hamid
Head of the Department

SEMESTER – V

Course Title	Software Engineering
Total Hrs	75
Hrs/Week	5
Sub.Code	21UCCS51
Course Type	C-XI
Credits	4
Marks	100

General Objective:

It aims to develop a broad understanding of the discipline of software engineering with a detailed knowledge of techniques for the analysis and design of complex software intensive systems.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Understand the discipline of software engineering.
CO-2	Understand the project management and its requirements.
CO-3	Application of system models.
CO-4	Understand the concept of real time software.
CO-5	Understand the user interface and design and apply testing in real time projects.

Unit – I

Introduction - What is Software - What is Software Engineering – Software Process –software Process model – software engineering methods. Emergent system properties - systems engineering – system requirements – system design – system modelling – sub-system development – system integration –system evolution – system decommissioning – system procurement. Software processes: Software Process models: the waterfall model – Evolutionary development – Spiral development – CASE

Unit – II

Project Management - Management activities – Project Planning – Milestones and Deliverables - Project Scheduling – Bar charts and activity networks. Software requirement : Functional and non-functional requirements – Domain requirements - User requirements – System requirements – Structured language specification - Software Requirements Document(SRS) .

Unit – III

System Models – Context models – Behavioural models – Data-flow models – State machine models. Architectural Design - System Organisation- Repository model – Client-server model – Layered model

Unit – IV

Real time software - System design – Real-time operating systems – Monitoring and control systems – Data Acquisition systems. User Interface design: User Interface design issues – User Interface design process - User Interface prototyping - interface evaluation .

Unit - V

Verification and Validation – Software inspections. Clean – room software development. Software testing: System testing – Integration testing – Release testing - Performance testing –Component testing – Interface Testing. Software cost estimation: Algorithmic cost modeling – The COCOMO model. Quality management: Process and product quality – Software measurement and metric.

Textbooks:

Software Engineering , IAN SOMMERVILLE , 8th Edition ,Pearson Education Asia.

UNIT I - Chapters 1.1,2.1,2.2,4.1,4.2,4.3,4.5

UNIT II - Chapters 5,6.1,6.2,6.3,6.5

UNIT III – Chapters 8.1,8.2,11, UNIT IV – Chapters 15,16

UNIT V - 22 , 23.1, 23.2 , 26.1 , 26.2, 26.3 , 27.1,27.3,27.4,27.5

Reference Books:

Software Engineering Theory and Practices, SHARI LAWRENCE PFLEEGER, 8thEdition, Pearson Education Asia.

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand the system requirements and software process model	1,3	Understanding
CO-2	Explain project management its requirements and project scheduling	1,3	Understanding
CO-3	Illustrate system models and its types	1,3	Applying
CO-4	Analyzing data acquisition models and user interface prototyping	1,3	Analyzing
CO-5	Evaluate the techniques of Verification and Validation and quality management techniques	1,3,5	Evaluating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credit						
V	21UCCS51	Software Engineering	75	4						
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓		✓	✓	✓	✓		✓		
CO-2	✓		✓	✓	✓	✓		✓		
CO-3	✓		✓	✓	✓	✓		✓		
CO-4	✓		✓	✓	✓	✓		✓		
CO-5	✓		✓	✓	✓	✓		✓		✓
Number of matches (✓) = 31 Relationship = Low/Medium/ High										

Prepared by
Name and Signature
M. Yogasini

Checked by
Head of the Department

Semester – V

Course Title	J2EE
Total Hrs	60
Hrs/Week	4
Sub.Code	21UCCS52
Course Type	C XII
Credits	4
Marks	100

General Objective:

The objective of this course is to provide the necessary **knowledge** to design and develop dynamic, database-driven application using J2EE. Students will learn how to connect to any JDBC-compliant database, and perform hands on practice with a database to create database-driven connectivity.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Explore J2EE Architecture.
CO-2	Apply the concepts of JDBC, Transaction processing, statement objects and Resultset to perform operations on Database
CO-3	Understanding the concept of Configuring the JSP Server, Handling JSP objects .
CO-4	Develop Servlets and HTML forms using servelt
CO-5	Develop distributed web application using RMI

UNIT I Introduction

The Java2 Enterprise Architecture - J2EE Multitier Architecture - **J2EE Implementation Architecture - Client Tier Implementation - Web Tier Implementation - EJB Tier Implementation.**

UNIT II Java Database Connectivity (JDBC)

Concept of JDBC - JDBC Driver Types - Loading JDBC Driver – Connect to the DBMS – **Database Connection – Statement Object – Prepared Statement – Callable Statement – Result Set – Retrieving Results.**

UNIT III Java Server Pages (JSP)

JSP Basics – Advantages of JSP – The Architecture of Java Server Pages (JSP) – JSP Tags - Control Statements – Loops - JSP Objects: Request Object – Out Object – Session Object.

UNIT IV Java Servlets

Introduction – Java Servlet – Advantages of Servlets – Servlet Life Cycle – A Simple Java Servlet Generating Plain Text – A Servlet that Generates HTML – Handling Forms with Servlets.

UNIT V Remote Method Invocation (RMI)

Introduction to RMI – RMI Interface – Passing Objects – The RMI Process – Server Side – Client Side – Creating RMI Application – Steps involved in running the RMI Application.

TEXT BOOK:

J2EE – Complete Reference, Jim Keogh”, Tata McGraw Hill Publication

REFERENCE BOOK:

Advanced Java Programming with Database Application – N. Krishnan, CIT, MSU

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand the Basic Concepts of J2EE architecture	1,3,5	Understanding
CO-2	Develop database concepts using JDBC	1,3,5	Applying
CO-3	Develop Programs based on JSP	1,3,5	Applying
CO-4	Create programs on servlets	1,3,5	Creating
CO-5	Develop distributed web application using RMI	1,3,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course					Hours	Credit		
V	21UCCS52	J2EE					4	4		
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
	1	2	3	4		1	2	3	4	5
CO-1	✓		✓	✓	✓	✓		✓		✓
CO-2	✓		✓	✓	✓	✓		✓		✓
CO-3	✓		✓	✓	✓	✓		✓		✓
CO-4	✓		✓	✓	✓	✓		✓		✓
CO-5	✓		✓	✓	✓	✓		✓		✓
Number of matches (✓) = 35 Relationship = Low/Medium/ High										

Prepared by
Mrs. J. Jannathul Firthous
Name and Signature

Checked by
Head of the Department

Semester – V

Course Title	Microprocessor
Total Hrs	60
Hrs/Week	4
Sub.Code	21UCCS53
Course Type	C- XIII
Credits	4
Marks	100

General Objective:

Understand basic architecture of 16 bit and 32-bit microprocessors and the techniques for faster execution of instructions and improve speed of operation. Understand concept of multi core processors.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Understand basic architecture of 16 bit and 32-bit microprocessors.
CO-2	Understand interfacing of 16-bit microprocessor with memory and peripheral chips involving system design.
CO-3	To understand techniques for faster execution of instructions and improve speed of operation and performance of microprocessors.
CO-4	Apply the programming techniques.
CO-5	understand RISC and CISC based microprocessors and the concept of multi core processors.

Unit – I Microprocessor, Microcomputers and Assembly Language:

Microprocessors- Microprocessor Instruction set and Computer Languages.

Introduction to 8085 and Assembly Language Programming:8085 Programming Model- Instruction Classification-Instruction, data format and storage - Overview of the 8085-instruction set.

Unit – II 8085 Microprocessor Architecture:

Microprocessor Architecture and its operations - The 8085 Microprocessing unit [MPU] – Example of an 8085 based Microcomputers- Memory Interfacing – memory mapped I/O.

Introduction to 8085 Instructions: Data transfer operations-Arithmetic operations- Logic operations- Branch operations.

Unit – III Programming Techniques with additional Instructions:

Programming Techniques – Looping, Counting and Indexing-Additional Data transfer 16-Bit Arithmetic Instructions-Arithmetic operations related to Memory-Logic operations-Rotate, Compare.

Counters and Time Delays: Counters and Time Delays-Hexadecimal counter- Modulo Ten Counter

Unit – IV Stack and Subroutines:

Stack –Subroutine-Restart, Conditional call and Return instructions-Advanced Subroutine Concepts- Microprocessor Controlled Traffic signal system.

Interrupts: 8085 Interrupts-Vectored Interrupts- Restart as Software Instructions

Unit – V 16-bit Microprocessor:

16-bit Microprocessors – Intel 8086/8088 - Intel 80186/80286 – High-end-Performance Processors - Intel 80386/80486 – Intel Pentium – RISC.

Textbooks:

Microprocessor Architecture Programming and Applications with the 8085- Ramesh S. Gaonkar- 5th Edition. Chapters:

Unit I: 1.1,1.2,2.1,2.2,2.3,2.5

Unit II: 3.1,4.1,4.2,4.2.3,2.5,5.4, 6.1 to 6.4

Unit III: 7, 8.1 to 8.4

Unit IV: 9, 12.1,12.2,12.3

Unit V: 18.1 to 18.4

Reference Books:

Advanced Microprocessors and Interfacing by Badri Ram, McGraw Publication.

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand the basic programming model of 8085 processor and its instruction	1,5	Understanding
CO-2	Explain the architecture of 8085	1,5	Understanding
CO-3	Construct the Microprocessors based programming techniques	1,5	Applying
CO-4	Apply the concept of Stack and Subroutine	1,5	Applying
CO-5	Evaluate 16-bit microprocessor	1,5	Evaluating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credit						
V	21UCCS53	Microprocessor	60	4						
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓			✓	✓	✓				✓
CO-2	✓			✓	✓	✓				✓
CO-3	✓			✓	✓	✓				✓
CO-4	✓			✓	✓	✓				✓
CO-5	✓			✓	✓	✓				✓
Number of matches (✓) = 25 Relationship = Low/ Medium /High										

Prepared by
Name and Signature
M.Yogasini

Checked by
Head of the Department

Semester – V

Course Title	J2EE Practical
Total Hrs	60
Hrs/Week	4
Sub.Code	21UCCS5P1
Course Type	CP VII
Credits	2
Marks	100

General Objective:

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Develop a database connection using JDBC.
CO-2	Develop JDBC programs to insert record in the table..
CO-3	Design web pages using the concept of JSP
CO-4	Display student information using JSP.
CO-5	Develop distributed web application using RMI

J2EE PRACTICAL

1. Create a table with the following information Name, Subject, Qualification, Percentage in an Access database using the class Java.Sql.Package
2. Write a JDBC program to insert a record.

Code	Names	Subject
1	One	100
2	Two	99
3	Three	99

3. Simply fetch the table information using JDBC.
4. Write a program to update record using prepared statement
5. Create a Servlet an simply display the message “Best Wishes to complete B.Sc(CS) Course Sucessfully” using Hyperlink.
6. Write a Servlet code using Get and Post Method.
7. Write a servlet code to change the explorer background color.
8. Write a JSP Program for Quiz
9. Write a JSP code to capture the user input Name, E-mail Id and other details about the student and display the information in the next form.
10. Write a RMI Program to add a two numbers.

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Develop Database connection with JDBC.	1,3,5	Applying
CO-2	Create a JDBC program to insert the record in JDBC.	1,3,5	Creating
CO-3	Write programs on JSP and Servlet.	1,3,5	Creating
CO-4	Develop student information using JSP.	1,3,5	Creating
CO-5	Develop distributed web application using RMI	1,3,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credit						
V	21UCCS5P1	J2EE Practical	4	2						
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓		✓	✓	✓	✓		✓		✓
CO-2	✓		✓	✓	✓	✓		✓		✓
CO-3	✓		✓	✓	✓	✓		✓		✓
CO-4	✓		✓	✓	✓	✓		✓		✓
CO-5	✓		✓	✓	✓	✓		✓		✓
Number of matches (✓) = 35 Relationship = Low/Medium/ High										

Prepared by

Checked by

Mrs. J. Jannathul Firthous
Name and Signature

Head of the Department

Semester – V

Course Title	Microprocessor Practical
Total Hrs	60
Hrs/Week	4
Sub.Code	21UCCS5P2
Course Type	CP-VIII
Credits	2
Marks	100

General Objective:

Perform Block Transform operation on memory. Sum 8-bit numbers in continuous memory locations. To count the number of appearance of a given 8 bit number in the continuous memory locations.

Course Objectives

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Understand arithmetic operation of 8-bit numbers.
CO-2	Find minimum and maximum of numbers.
CO-3	Separation of hexadecimal numbers into two nibbles.
CO-4	Search the given number in memory.
CO-5	Perform block transfer operation and understand the counting principles of 8-bit numbers.

MICROPROCESSOR PRACTICAL

- 1) a) Addition of two 8 bit nos.
b) Subtraction of two 8 bit nos.
- 2) Multiplication of two 8 bit nos.
- 3) Division of two 8 bit nos.
- 4) Arrange the given set of numbers in Ascending/Descending order
- 5) Finding Maximum / Minimum in the given set of numbers.
- 6) Block transfer (move a set of data from one location to another)
- 7) a) Separate the hexadecimal into two nibbles
b) Combine two nibbles into 8-bit number.
- 8) Find the sum of 8 bit numbers stored in five continuous memory locations
- 9) To Search whether the given number is in the list of memory locations.
- 10) To count the number of appearance of a given 8 bit number
in the continuous memory locations.

Course Outcomes

Course Outcomes: The learners will be able to:

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Apply arithmetic operations.	1,3,5	Applying
CO-2	Calculate minimum and maximum numbers.	1,3,5	Applying
CO-3	Illustrate block transfer operation.	1,3,5	Analyzing
CO-4	Assess addition operation in five continuous memory locations.	1,3,5	Evaluating
CO-5	Evaluate the given number is in the list of memory locations and perform counting operations in memory locations.	1,3,5	Evaluating

Relationship Matrix

Semester	Course Code	Title of the Course					Hours	Credits				
V	21UCCS5P2	Microprocessor Practical					60	2				
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)						
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5		
CO-1	✓		✓	✓	✓	✓		✓		✓		
CO-2	✓		✓	✓	✓	✓		✓		✓		
CO-3	✓		✓	✓	✓	✓		✓		✓		
CO-4	✓		✓	✓	✓	✓		✓		✓		
CO-5	✓		✓	✓	✓	✓		✓		✓		
Number of matches (✓) = 35 Relationship = Low/Medium/ High												

Prepared by
Name and Signature

Checked by
Head of the Department

M. Yogasini

Semester – V

Course Title	RDBMS
Total Hrs	60
Hrs/Week	4
Sub.Code	21UECS5A
Course Type	DSE I
Credits	3
Marks	100

General Objective:

Describe the fundamental elements of relational database management systems . Explain the basic concepts of relational data model, entity-relationship model, relational **database design**, **relational algebra and SQL**.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Introduce the concept of DBMS.
CO-2	Implement the system operations.
CO-3	Demonstration on Aggregate Functions.
CO-4	Develop Constraints and Normalization.
CO-5	Construct Entity Relationship Model.

UNIT I

Introduction: Database-System Applications – Purpose of Database Systems – View of Data - Database Languages - Relational Databases – Database design - Relational Model: Structure of Relational Databases – Fundamental Relational - Algebra Operations: The Select, Project, Union, Set-

Difference, Cartesian-Product, Rename Operations – Formal Definition of the Relational Algebra.

UNIT II

Additional Relational-Algebra Operations - Extended Relational-Algebra Operations – Null Values - Modification of the Database - SQL: Background – Data Definition: Basic Domain Types – Basic Schema Definition in SQL - Basic Structure of SQL Queries - Set Operations: Union, Intersect, Except operation.

UNIT III

Aggregate Functions – Null Values – Nested Sub queries – Complex Queries – Views – Modification of the Database: Deletion, Insertion, Updates, Update of a view, Transactions - Advanced SQL: SQL Data Types and Schemas – Integrity Constraints: Not null, Unique, Check, Referential Integrity, Assertions – Authorization.

UNIT IV

Overview of Design Process – Design Phases - ER Model –Entity sets- Relationship sets - Attributes - Constraints – Mapping cardinalities - Keys – Entity sets – Relationship sets - ER Diagrams –Weak Entity Sets –Extended E-R Features – Specialization – Generalization- Alternative E-R Notations- Database design for banking Enterprise – Data Requirements for the Bank Database -Entity Sets for the Bank Database -Relationship Sets for the Bank Database -ER Diagram for the Bank Database.

UNIT V:

Atomic Domains and First Normal Forms - Decomposition using Functional Dependencies – Keys and Functional Dependencies-Boyce- Codd Normal Form-BCNF and Dependency Preservation- Third Normal form- Higher Normal Forms .- Comparison of BCNF and 3NF - Multivalued Dependencies - Fourth Normal Form- More Normal Forms

TEXT BOOK:

DATABASE SYSTEM CONCEPTS – Abraham Silberschatz, Henry F. Korth, S. Sudarshan

REFERENCE BOOK:

Database Systems Concepts, Designs and Application – Shio Kumar Singh Second Edition , Pearson Publications

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand the concept of DBMS.	1,4,5	Understanding
CO-2	Develop basic algebraic functions.	1,5	Applying
CO-3	Classify on Aggregate Functions.	1,4,5	Analyzing
CO-4	Develop Constraints and Normalization.	1,4,5	Creating
CO-5	Construct Entity Relationship Model.	1,4,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course					Hours	Credit		
V	21UECS5A	RDBMS					4	3		
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO3	PLO4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓		✓	✓	✓			✓	✓
CO-2	✓	✓		✓	✓	✓			✓	✓
CO-3	✓	✓		✓	✓	✓			✓	✓
CO-4	✓	✓		✓	✓	✓			✓	✓
CO-5	✓	✓		✓	✓	✓			✓	✓
Number of matches (✓) = 35 Relationship = Low/Medium/ High										

Prepared by
Mrs. S. Fathima Suhara
Name and Signature

Checked by
Head of the Department

Semester – V

Course Title	ANDROID Programming
Total Hrs	60
Hrs/Week	4
Sub.Code	21UECS5B
Course Type	DSE-I
Credits	3
Marks	100

General Objective:

Understand the usage of tools and features and to build the ability of designing Android apps and mould the skills for coding in the language.

Course Objectives: The learners will be able to::

CO	Course Objectives
CO-1	Understanding basic concepts of Android Programming.
CO-2	To develop software with reasonable complexity on mobile platform.
CO-3	Discover the life cycles of Activities, Applications, intents and fragments.
CO-4	Choose the Android apps by using Java Concepts.
CO-5	Design the concepts of background tasks and Working with data in Android.

Unit I **Basic of Android Programming:**

Introduction to Android OS, Setting up the Android Application Development Environment, Creating, Testing and Debugging Applications, Android Stack, Android applications structure, Activity life cycle, Understanding implicit and explicit intents.

Unit II **User Interface in Android:**

Adaptive and responsive user interfaces, User Input Controls, Menus, Screen Navigation, RecyclerView, Drawables, Themes and Styles, Fragments Fragment Life Cycle, Introduction to Material Design, Testing the user interface.

Unit III Background tasks:

AsyncTask, AsyncTaskLoader, Connecting App to Internet, Broadcast receivers, Services, Notifications, Alarm managers.

Unit IV Sensor, Location and Maps:

Sensor Basic, Motion and Position Sensors, Location services, Google maps API, Google Places API

Unit V Working with data in Android:

Shared Preferences, App Setting, SQLite primer, Store data using SQLite database, Content Providers, Content Resolver, Loader

References:

1. Android: A Programming Guide by J.F. DiMarzio
2. Hello, Android: Introducing Google's Mobile Development Platform by Ed Burnett
3. Programming android by Zigurd Mednieks
4. Android User Interface Design: Turning Ideas and Sketches into Beautifully Designed Apps by Ian G. Clifton
5. Android Developer Fundamental Course by Google. 6. Advance Android Developer Course by Google.

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understanding of fundamental of Android Programming	1,3,5	Understanding
CO-2	To develop software with reasonable complexity on mobile platform	1,2,3,5	Applying
CO-3	Discover the life cycles of Activities, Applications, intents and fragments	1,2,3,5	Applying
CO-4	Design the Android apps by using Java Concepts	1,3,5	Creating
CO-5	Develop the background tasks and Working with data in Android.	1,2,3,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credit						
V	21UECS5B	Android Programming	4	3						
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓		✓	✓		✓		✓
CO-2	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO-3	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO-4	✓	✓	✓		✓	✓		✓		✓
CO-5	✓	✓	✓	✓	✓	✓	✓	✓		✓
Number of matches (✓) = 41 Relationship = Low/Medium/ High										

Prepared by
Mr. K.A.Ameer Hamsha
Name and Signature

Checked by
Dr. A. Shakul Hamid
Head of the Department

Semester – V

Course Title	Quantitative Aptitude
Total Hrs	60
Hrs/Week	4
Sub.Code	21UECS5C
Course Type	DSE II
Credits	3
Marks	100

General Objective:

1. Learn about the mathematical concepts.
2. To know more about aptitude based concepts.
3. To know more about Reasoning based concepts.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Demonstrate on Age related problems.
CO-2	Demonstrate permutation and combination.
CO-3	Acquire knowledge in Data Interpretation.
CO-4	Implement the concept of Time and Distances.
CO-5	Demonstrate Blood Relations and seating arrangements

UNIT I:

Percentage - Problem on Ages

UNIT II:

Probability - Permutation and Combination

UNIT III:

Data Interpretation - Time and distance

Unit IV:

Coding and Decoding - Blood Relations

UNIT V:

Seating Arrangements - Direction Sense Test

TEXT BOOK:

QUANTITATIVE APTITUDE AND TEST OF REASONING BY R.S.AGGARWAL

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Develop programs on Age related problems.	1,5	Understanding
CO-2	Demonstrate permutation and combination.	1,5	Understanding
CO-3	Develop knowledge in Data Interpretation.	1,5	Creating
CO-4	Solve programs on concept of Time and Distances.	1,5	Creating
CO-5	Solve programs on Blood Relations and seating arrangements	1,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course					Hours	Credit		
V	21UECS5C	Quantitative Aptitude					4	3		
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓			✓	✓	✓				✓
CO-2	✓			✓	✓	✓				✓
CO-3	✓			✓	✓	✓				✓
CO-4	✓			✓	✓	✓				✓
CO-5	✓			✓	✓	✓				✓
Number of matches (✓) = ...25.... Relationship = Low /Medium/High										

Prepared by
Mrs. S. Fathima Suhara
Name and Signature

Checked by
Head of the Department

Semester – V

Course Title	Artificial Intelligence
Total Hrs	60
Hrs/Week	4
Sub.Code	21UECS5D
Course Type	DSE II
Credits	3
Marks	100

General Objective:

Learns the basic principles, models, and algorithms of AI to recognize, model, and solve problems in the analysis and design of information systems. analyze the structures and algorithms of a selection of techniques related to searching, reasoning, machine learning, and language processing.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Understand the concept of Artificial Intelligence.
CO-2	Apply the concept of knowledge reasoning and planning.
CO-3	Analysis the concept of Natural Language Processing.
CO-4	Develop Perception.
CO-5	Develop the concept of Robotics.

UNIT I

Introduction: What Is AI? - **Intelligent Agents:** Agents and Environments - Good Behavior: The Concept of Rationality-Structure Of Agent - **Problem Solving:** Problem Solving Agents-Searching for Solutions – Uninformed Search Strategies - Informed (Heuristic) Search Strategies- Heuristic Function.

UNIT II

Knowledge Reasoning and Planning: Local Agents: Knowledge-Based Agents – Logic - Propositional Logic-**First Order Logic:** Syntax And Semantics of First Order Logic-Using First Order Logic

UNIT III

Natural Language Processing: Language Models - Text Classification - Information Retrieval - Information Extraction - **Natural Language Communication:** Phrase Structure Grammars-Syntactic Analysis (Parsing)- Machine Translation-Speech Recognition

UNIT IV

Perception: Image Formation-Early Image-Processing Operations- Object Recognition by Appearance-Reconstructing The 3d World-Object Recognition from Structural Information-Using Vision

UNIT V

Robotics: Introduction- Robot Hardware- Robotic Perception- Planning to Move- Planning Uncertain Movements- Moving- Robotic Software Architectures- Application Domains

TEXTBOOK

“Artificial Intelligence-A Modern Approach” by Stuart J. Russell and Peter Norvig, 3rd Edition, 2010, Pearson Publication

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
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CO-1	Understand the concept of Artificial Intelligence.	1,4,5	Understanding
CO-2	Apply the concept of knowledge reasoning and planning in AI.	1,5	Applying
CO-3	Analysis the concept of Natural Language Processing and Communoication in AI.	1,4,5	Analyzing
CO-4	Solve real-world problems in organizational processes and workflows by applying critical thinking, problem-solving, and cognitive computing skills.	1,4,5	Creating
CO-5	Develop robotic process automation to manage business processes and to increase and monitor their efficiency and effectiveness.	1,4,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course					Hours	Credit		
V	21UECS5D	Artificial Intelligence					4	3		
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓		✓	✓	✓			✓	✓
CO-2	✓	✓		✓	✓	✓			✓	✓
CO-3	✓	✓		✓	✓	✓			✓	✓
CO-4	✓	✓		✓	✓	✓			✓	✓
CO-5	✓	✓		✓	✓	✓			✓	✓
	Number of matches (✓) = 35 Relationship = Low/Medium/ High									

Prepared by
Mrs. J. Jannathul Firthous
Name and Signature

Checked by
Head of the Department

Semester – VI

Course Title	Data Communications and Networking
Total Hrs	60
Hrs/Week	4
Sub.Code	21UCCS61
Course Type	C XIV
Credits	4
Marks	100

General Objective:

To understand the fundamental concepts of data communication and networking technologies besides the topologies of LAN, MAN, and WAN in the ISO OSI model and its services.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Describe the structure of OSI model.
CO-2	Differentiate the transmission media in network connection.
CO-3	Analyze the services of each layer in OSI model.
CO-4	Categorize the LAN version.
CO-5	Illustrate the data distribution process in OSI model.

UNIT I Introduction about Network:

Introduction - Data Communication – Networks – Protocols and Standards – Standards Organizations .Basic Concepts: Line Configuration – Topology – Transmission Mode – Categories of Networks – Internetworks.

The OSI Model: The model – Functions of the layers (Physical,Data Link, Network,Transport , Session,Presentation and Application Layers)

UNIT II Transmission Media

Transmission Media Guided media (Twisted – Pair Cable, Coaxial Cable,Optical Fiber) – Unguided media (Radio frequency Allocation, Propagation of Radio Waves, Terrestrial Microwave, Satellite Communication, Cellular Telephony)

UNIT III DataLink Control:

DataLink Control: Line Discipline – Flow Control – Error Control. Network Layer Function : Circuit Switching – Packet Switching – Message Switching – Network Layer(Connection – Oriented and Connectionless services)

UNIT IV LAN :

LAN : Project 802, Ethernet – IEEE 802.3. CSMA/CD – Token Bus – Token Ring – FDDI MAN :IEEE 802.6(DQDB).

UNIT V Transport Layer:

Transport Layer: Duties of the transport Layer . - Presentation Layer: Translation – Encryption /Decryption – Authentication Data Compression Application Layer :Message Handling system – File Transfer, Access and Management ,Virtual Terminal, Directory Services, Common Management Information Protocol.

TEXT BOOK:

“Introduction to Data communication and networking “ – Behrouz Forouzan - Tata Mcgraw Hill 2rd Edition ,2006.

REFERENCE BOOKS:

“Computer Networks” – Andrew S. Tanenbaum,4th Edition,PHI.

Course Outcomes

Course Outcomes: The learners will be able to:

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand the basic structure of OSI model.	2,4	Understanding
CO-2	Categorize the Guided and Unguided transmission media.	2,4	Analyzing
CO-3	Distinguish each layer in OSI model.	2,4	Analyzing
CO-4	Classify LAN version.	2,4	Analyzing
CO-5	Distinguish the data distribution process in OSI model.	2,4	Evaluating

Relationship Matrix

Semester	Course Code	Title of the Course					Hours	Credit		
VI	21UCCS61	Data Communications and Networking					4	4		
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO	PLO	PLO	PLO	PLO	PSO	PSO	PSO	PSO	PSO
	1	2	3	4	5	1	2	3	4	5
CO-1	✓	✓	✓	✓			✓		✓	
CO-2	✓	✓	✓	✓			✓		✓	
CO-3	✓	✓	✓	✓			✓		✓	
CO-4	✓	✓	✓	✓			✓		✓	
CO-5	✓	✓	✓	✓			✓		✓	
Number of matches (✓) = 30 Relationship = Low/ Medium /High										

Prepared by
Name and Signature

Checked by
Head of the Department

Semester – VI

Course Title	C# Programming
Total Hrs	60
Hrs/Week	4
Sub.Code	21UCCS62
Course Type	C- XV
Credits	4
Marks	100

General Objective:

This course is designed to provide the knowledge of Dot Net Frameworks along with C#

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Understand the basic concept of Object oriented programming.
CO-2	Compare and contract Loops
CO-3	Develop user defined methods from pre defined methods.
CO-4	Construct Structure and Enumerations.
CO-5	Implement Interface and Exception handling.

UNIT I

Overview of C#: Introduction – simple C# program - Namespaces – comments – command line arguments – mathematical functions – Program structure – Literals – variables – data types – value types –reference types - scope of variables - boxing and unboxing - Operators and Expressions – conditional operators – bitwise operators – special operators – precedence of operators – type conversions

UNIT II

Decision making and branching – simple if – if..else – else if ladder – switch statement – conditional operator - decision making and looping – for, while, do, foreach statements – Jumps in loops . Handling arrays – one dimensional arrays – creating an array – two dimensional arrays – variable size arrays – System.Array Class – ArrayList Class – Manipulating Strings.

UNIT III

Methods in C# - declaring methods – Main method – invoking methods – nesting of methods – method parameters – pass by value – pass by reference – output parameters – variable argument lists – Structures and enumerations.

UNIT IV

Classes and Objects – member access modifiers – constructors – overloading constructors – destructors – This reference – Constant and Read only members – properties - Indexers – Inheritance and polymorphism – Containment inheritance – visibility Control – overloading methods - overriding methods – hiding methods - abstract classes – sealed classes – polymorphism.

UNIT V

Interfaces – multiple inheritance - Operator overloading – Delegate Declaration and Instantiation - Events – Managing Errors and Exceptions – Throwing our own exceptions – nested try blocks – Checked and Unchecked Operators.

TEXT BOOK:

Programming in C# - E. Balagurusamy– Third Edition - Tata McGraw Hill Education Ltd.

REFERENCE BOOK:

C# Complete Reference – Herbert Schildt – Tata McGraw Hill Education Ltd.

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand the Data type and Variables in C#	1,3,5	Understanding
CO-2	Compare the Concept of Loops.	1,3,5	Understanding
CO-3	Classify the concepts of OOPS and learn how to design C# Classes for Code reuse.	1, 3,5	Analyzing
CO-4	Predict the concept of Inheritance and apply constructor in the derived classes	1,3,5	Evaluating
CO-5	Criticize on operator overloading and rules for operator overloading.	1,3,5	Evaluating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credit						
VI	21UCCS62	C# Programming	4	4						
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓		✓	✓	✓	✓		✓		✓
CO-2	✓		✓	✓	✓	✓		✓		✓
CO-3	✓		✓	✓	✓	✓		✓		✓
CO-4	✓		✓	✓	✓	✓		✓		✓
CO-5	✓		✓	✓	✓	✓		✓		✓
Number of matches (✓) = 35 Relationship = Low/Medium/ High										

Prepared by
Mrs. J. Jannathul Firthous
Name and Signature

Checked by
Head of the Department

Semester – VI

Course Title	Oracle
Total Hrs	60
Hrs/Week	4
Sub.Code	21UCCS63
Course Type	C XVI
Credits	4
Marks	100

General Objective:

To develop the knowledge about Mass Storage, Removes Duplicity Multiple Users Access, Data Protection, Data backup and recovery Integrity, Platform independent

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Identify the data storage in database management system.
CO-2	Manipulate the data in database.
CO-3	Construct the group of records in the specified category.
CO-4	Distinguish the data process using SQL* Plus commands
CO-5	Integrate the concept of Procedures and Function in PL/SQL

UNIT - I Oracle Tables: Data Definition Language(DDL) :

Data Types: Varchar2-Char-Number- Date, Constraints: Types of Constraints-Naming a Constraint-Defining a Constraint. Creating on Oracle Table: STORAGE Clause in CREATE TABLE. Altering an Existing Table-Adding a New Column to an Existing Table-Modifying an Existing Column-Adding a Constraint-Dropping Column (Oracle8i Onward)-Dropping a Constraint-Enabling /Disabling Constraints-Renaming a Column (Oracle9i Version 9.2 Onward)-Modifying Storage of a Table. Dropping a Table- Renaming a Table-Truncating a Table.

UNIT II Working with Tables: Data Manipulation Language(DML)

Date Management and Retrieval:Data Manipulation Language(DML)-Adding a New Row/Record:Rounding by INSERT-Entering Null Values-Entering Default Values-Substitutions Variables.Updating Existing Rows/Records-Deleting Existing Rows/Records-Retrieving Data from a Table:SELECT(*)-DISTINCT Function-Column Alias-COLUMN Command-Concatenation.

UNIT III Working With Tables: Functions and Grouping

Functions and Grouping:Built-In Functions-Single-Row Functions-Group Functions-Grouping Data: Having Clause-Nesting Group Functions:Multiple Tables:Joins and Set Operators: Join-Cartesian Product-Equijoin-Table Aliases-Additional Conditions- Non Equi Join-Outer Join- Self-Join- Set Operators: Union-Union All-Intersect-Minus.

UNIT IV SQL*PLUS:

Menus - Commands - Editing the command line - The Describe,Column,Save,Get,Strat,Edit Commands. BASIC SQL: Oracle and SQL-SQL Language Basics-Select command-Oracle 8 Data types-Expressions and Operators-Functions,Insert,Update,Delete Command,Transactions.

UNIT V Indexes:

Create,Change,Recreate,Eliminate an Index-Sequence: Create,Delete-Change Sequences- Views: Create,Select,Delete, Stored procedures and functions:Create,Execute,Delete a stored procedure-Functions:Create,Execute a function.

TEXT BOOKS:

1. Database system using oracle-Nilesh Shah-Prentice-Hall of India Private Limited.
2. Learn Oracle 8i-Jose.A.Ramalho-B.P.B Publications,Chapter 6,7,9 to 12,15 and 17

REFERENCE BOOK:

Database System Concepts 5th Edition-Abraham Silberschatz,Henry F.Korth,S.,Sudarshan-McGraw-Hill Publication.

Course Outcomes

Course Outcomes: The learners will be able to:

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand the database concepts and illustrate the concept of data definition language	1,3,5	Understanding
CO-2	Illustrate the concept of data manipulation language	1,3,5	Applying
CO-3	Apply the concept of data retrieval by group function in the basic SQL.	1,3,5	Applying
CO-4	Distinguish the SQL * Plus Menus.	1,3,5	Analyzing
CO-5	Manage the PL/SQL statements with procedure and functions.	1,3,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course					Hours	Credit		
VI	21UCCS63	Oracle					4	4		
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓		✓	✓	✓	✓		✓		✓
CO-2	✓		✓	✓	✓	✓		✓		✓
CO-3	✓		✓	✓	✓	✓		✓		✓
CO-4	✓		✓	✓	✓	✓		✓		✓
CO-5	✓		✓	✓	✓	✓		✓		✓
	Number of matches (✓) = 35 Relationship = Low/Medium/ High									

Prepared by
Name and Signature
D.M.Annie Brighty Christilin

Checked by
Head of the Department
J.Jannathul Firthous

Semester – VI

Course Title	C# Programming Practical
Total Hrs	60
Hrs/Week	4
Sub.Code	21UCCS6P1
Course Type	CP IX
Credits	2
Marks	100

General Objective:

Learns about NET Framework to develop programs useful for a broad range of desktop and Web applications.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Construct EB Bill using switch statement.
CO-2	Develop looping statements.
CO-3	Implement Operator Overloading.
CO-4	Implement Polymorphism.
CO-5	Develop Overridden methods and binding methods and Files.

C# PROGRAMMING PRACTICAL

1. Write a program to prepare electricity bill using switch statement.
2. Write a program to display all prime numbers between two given numbers.
3. Write a program using for each statement.
4. Write a program to find n factorial using recursion.
5. Write a program to implement constructor overloading.
6. Write a program to perform matrix operations using object.
7. Write a program to implement user defined Exception.
8. Write a program to implement inheritance.
9. Write a program to implement operator overloading.
10. Write a program to implement polymorphism.
11. Write a program to implement interfaces.
12. Write a program to implement overriding methods and hiding methods.
13. Write a program to copy contents of a file to two different destinations.

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Develop C# programs based on Switch Statement.	1,3,5	Applying
CO-2	Implement Inheritance and interface	1,3,5	Applying
CO-3	Write programs on Operator Overloading	1,3,5	Applying
CO-4	Implement String Manipulation within .NET Application Environment	1,3,5	Applying
CO-5	Write programs on files and manipulate operations on files	1,3,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course					Hours	Credit		
VI	21UCCS6P1	C# Programming Practical					4	2		
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓		✓	✓	✓	✓		✓		✓
CO-2	✓		✓	✓	✓	✓		✓		✓
CO-3	✓		✓	✓	✓	✓		✓		✓
CO-4	✓		✓	✓	✓	✓		✓		✓
CO-5	✓		✓	✓	✓	✓		✓		✓
Number of matches (✓) = 35 Relationship = Low/Medium/ High										

Prepared by
Mrs. J. Jannathul Firthous
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Checked by
Head of the Department

Semester – VI

Course Title	Oracle Practical
Total Hrs	60
Hrs/Week	4
Sub.Code	21UCCS6P2
Course Type	CP X
Credits	2
Marks	100

General Objective:

To design and develop the database application system with transaction processing and recovery techniques

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Construct the data storage using SQL Query.
CO-2	Manipulate the data using database management language.
CO-3	Illustrate the data retrieval with the desired format under the specified criteria.
CO-4	Evaluate the data processing in relational database.
CO-5	Manage the stored procedures and functions in PL/SQL.

1. Creating, modifying and dropping tables.
2. Creating tables with referential and check constraints.
3. Inserting, modifying, deleting rows.
4. Dropping, disabling / enabling constraints.
5. Retrieving rows with operators in where clause.
6. Retrieving rows with Character functions.
7. Retrieving rows with Number and Date functions.
8. Retrieving row with Group functions and HAVING.
9. Joining Tables (Inner and Outer)
10. Simple PL/SQL Programs.
11. PL/SQL program with control structures.
12. PL/SQL program with procedures.
13. PL/SQL program with functions using IN & OUT parameters.

Course Outcomes

Course Outcomes: The learners will be able to:

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Construct the concept of data definition language.	1,3,5	Applying
CO-2	Illustrate the concept of data manipulation language.	1,3,5	Applying
CO-3	Distinguish the different types of Operators and Functions	1,3,5	Analyzing
CO-4	Evaluate the concept of Joining Tables	1,3,5	Evaluating
CO-5	Create procedures and Functions in PL/SQL.	1,3,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course					Hours	Credit		
VI	21UCCS6P2	Oracle Practical					4	2		
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓		✓	✓	✓	✓		✓		✓
CO-2	✓		✓	✓	✓	✓		✓		✓
CO-3	✓		✓	✓	✓	✓		✓		✓
CO-4	✓		✓	✓	✓	✓		✓		✓
CO-5	✓		✓	✓	✓	✓		✓		✓
	Number of matches (✓) = 35 Relationship = Low/Medium/ High									

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J.Jannathul Firthous

Semester – VI

Course Title	MOBILE COMMUNICATIONS
Total Hrs	60
Hrs/Week	4
Sub.Code	21UECS6A
Course Type	DSE-III
Credits	3
Marks	100

General Objective:

Understanding Global System for Mobile Communications and Wire Application Protocol and learn various Emerging technologies.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Discuss about various mobile computing functions
CO-2	Apply the various network standards
CO-3	Classify the various architecture
CO-4	Create the various emerging technologies
CO-5	Develop the concept of GSM and Learn about WAP

UNIT I

Introduction : Mobile Computing - Mobile Computing functions - Mobile Computing Devices - Networks Standards

UNIT II

Architecture for Mobile Computing-Three Tier Architecture: Tier-1, Tier-2, Tier-3 –GPS

UNIT III

Emerging Technologies: Bluetooth - Bluetooth protocol - Bluetooth protocol stack- Radio Frequency Identification (RFID)

UNIT IV

Global System for Mobile Communications (GSM) - GSM Architecture - GSM entities.

UNIT V

Wire Application Protocol(WAP) - WAP Application Environment (WAE) - Wireless LAN – Applications

TEXT BOOK :

1. Mobile Computing Technology, Application and Service Creation, Asoke K.Talukder and Roopa R.Yavaga - Tata Mcgraw Hill Publications.

REFERENCE BOOKS:

1. Mobile Computing, Biplob.k Sikdar and Sipra Dasbit, Pretice Hall Of India
2. Mobile Communications, J.Schilter, Addison-Wesley Publications

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand the concepts of mobile computing functions	1,2,3,5	Understanding
CO-2	Establish the various type of network standards	2,3,4,5	Applying
CO-3	Illustrate about various architecture	2,3,4,5	Applying
CO-4	Distinguish about various emerging technologies	2,3,4,5	AN
CO-5	Develop the concept of GSM and Learn about WAP.	3,4,5	U

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credit						
VI	21UECS6A	MOBILE COMMUNICATIONS	4	3						
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓	✓	✓	✓	✓			✓
CO-2	✓	✓	✓	✓	✓		✓	✓	✓	✓
CO-3	✓	✓	✓	✓	✓		✓	✓	✓	✓
CO-4	✓	✓	✓	✓	✓		✓	✓	✓	✓
CO-5	✓	✓	✓	✓	✓			✓	✓	✓
Number of matches (✓) = 43 Relationship = Low/Medium/ High										

Prepared by
P. Neamathul Fayed
Name and Signature

Checked by
Dr. A. Shakul Hamid
Head of the Department

Semester -VI

Course Title	DATA MINING
Total Hrs	60
Hrs/Week	4
Sub.Code	21UECS6B
Course Type	DSE-III
Credits	3
Marks	100

General Objective:

Understand and introduce students the data mining principles and techniques and acquaint the students with different data mining techniques with basic terminologies and modeling and analyze and produce report/memo of any large sets of data of any business to make decisions and demonstrate basic data mining algorithms, methods, and tools.

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Understanding the basic concepts of Data Warehouse and Data Mining techniques
CO-2	Examine the types of the data to be mined and apply pre-processing methods on raw data
CO-3	Explain the designing of Data Warehousing schema for applications
CO-4	Predict interesting patterns, analyze supervised and unsupervised models and estimate the accuracy of the algorithms.
CO-5	Design various tools of Data Mining and their techniques to solve the real time problems and to develop ability to design various algorithms based on data mining tool.

UNIT I

Introduction: What is Data Mining - Data Mining Applications – Data Mining Techniques -**Data Understanding and Data Preparation** - Introduction-Data Collection and Pre-Processing - Types of Data - Displaying Data Graphically

UNIT II

Association Rules Mining: Basics – The task and a Naïve Algorithm – The Apriori Algorithm – Improving the efficiency of the Apriori Algorithm – Apriori TID – Direct hashing and pruning – Dynamic item set counting – Mining frequent patterns without candidate generation – Performance evaluation of algorithms – Software for association rule mining.

UNIT III

Classification: Decision tree – Building a decision tree – The tree induction algorithm – Split algorithm based on information theory – Split algorithm based on the Gini index – Over fitting and Pruning – Decision tree rules – Naïve Bayes Method – Estimating predictive accuracy of classification methods – Improving accuracy of classification methods – Other evaluation criteria for classification methods – Classification software.

UNIT IV

Cluster analysis: Introduction- Desired features of cluster analysis –Types of cluster analysis methods – Partitional methods – Hierarchical methods – Density-based methods – Dealing with large databases – Quality and validity of cluster analysis methods – Cluster analysis software - **Web Data Mining:** Web terminology and characteristics – Locality and hierarchy in the Web – Web content mining – Web usage mining – Web structure mining – Web Data Mining – Web terminology and characteristics – Locality and hierarchy in the Web – Web content mining – Web usage mining – Web structure mining – Web mining software

UNIT V

Search Engines and Query Mining: Introduction-Search Engine Functionality-Search Engine Architecture - Ranking of Web pages - Search Query Mining - Data Warehousing Introduction-Data warehouse design - Data warehouse Metadata – **OLAP:** Introduction-Multi dimensional View and Data Cube-OLAP Software.

TEXTBOOK

“Introduction to Data Mining with Case Studies” by G.K. Gupta, 2nd Edition, 2008, Prentice Hall Publications.

REFERENCE BOOK

“Data Mining Techniques”, Arun K. Pujari, 1st Edition, 2001, Universities Press (India) Private Limited.

Course Outcomes

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand the concepts of Data Warehouse and Data Mining techniques.	1,2,4,5	Understanding
CO-2	Apply raw data to make it suitable for various data mining algorithms..	1,2,4,5	Applying
CO-3	Discover the model for real time data warehousing applications.	1,3,4,5	Applying
CO-4	Distinguish the DM techniques of clustering, classification, association, feature selection to represent data visually.	3,5	Analyzing
CO-5	Develop concepts and techniques of Information Retrieval, Web Search, Data Mining, and Machine Learning for extracting knowledge from the web and use various data mining tools	4,3,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credit						
VI	21UECS6B	DATA MINING	4	3						
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓	✓	✓	✓	✓		✓	✓
CO-2	✓	✓	✓	✓	✓	✓	✓		✓	✓
CO-3	✓	✓	✓	✓	✓	✓			✓	✓
CO-4	✓	✓	✓		✓			✓		✓
CO-5	✓	✓	✓	✓	✓			✓	✓	✓
Number of matches (✓) = 45 Relationship = Low/Medium/ High										

Prepared by
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S.M.A.Khaleelur Rahman

Checked by
Head of the Department
Dr. A.Shakul Hamid

Semester – VI

Course Title	Internet of Things
Total Hrs	30
Hrs/Week	2
Sub.Code	21USCS61
Course Type	SEC V
Credits	2
Marks	100

General Objective:

To describe an overview of an Internet of Things & enabling technologies and design IOT application using generic methodology of IOT

Course Objectives: The learners will be able to:

CO	Course Objectives
CO-1	Discover the IOT level in real time challenges.
CO-2	Illustrate the concept of IOT application in specific domain such as Agriculture, Home,etc.,
CO-3	Analyze the concept of IOT and Machine-to-Machine.
CO-4	Design an IOT application.
CO-5	Manage the functions of Raspberry Pi model.

UNIT - I : INTRODUCTION TO IOT

Internet of Things - Physical Design - Logical Design - IoT Enabling - Technologies - IoT Levels & Deployment Templates

UNIT – II : DOMAIN SPECIFIC IOTs

Introduction – Homes – Cities – Environment - Agriculture - Industry

UNIT – III : IoT and M2M

Introduction - M2M - Difference between IoT and M2M

UNIT – IV : DEVELOPING INTERNET OF THINGS

Introduction - IOT Design Methodology

UNIT - V : IOT PHYSICAL DEVICES AND END POINTS

What is an IoT Device - Basic building blocks of an IoT Device - Exemplary Device:Raspberry Pi

TEXT BOOKS:

ArshdeepBahga, Vijay Madiseti, –Internet of Things – A hands-on approach
Universities Press, 2015

REFERENCE BOOK:

“Getting Started with Internet of Things” – Cuno Pfister

Course Outcomes

Course Outcomes: The learners will be able to:

CO	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand the basic concepts of IOT and enabling Technologies	1,2,3,5	Understanding
CO-2	Construct the Domain Specific IOTs	1,2,3,5	Applying
CO-3	Distinguish the functions of IOT and M2M	1,2,3,5	Analyzing
CO-4	Estimate the concept of IOT Design Methodology	1,2,3,5	Evaluating
CO-5	Create an IOT application using Raspberry Pi model	1,2,3,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course					Hours	Credit		
VI	21USCS61	Internet of Things					2	2		
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO-2	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO-3	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO-4	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO-5	✓	✓	✓	✓	✓	✓	✓	✓		✓
Number of matches (✓) = 45										
Relationship = Low/Medium/ High										

Prepared by

Checked by

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D.M.Annie Brighty Christilin

Head of the Department
J.Jannathul Firthous