VANITA VISHRAM WOMEN'S UNIVERSITY

(Managed By: Vanita Vishram, Surat)

1st Women's University of Gujarat

SCHOOL OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE

5 YEARS INTEGRATED M.Sc. (IT)

SYLLABUS

AS PER NEP-2020

W.E.F 2024-25

INDEX

1 PREAMBLE – VVWU

Vanita Vishram Women's University (VVWU) is the First-ever Women's University of Gujarat approved by the Government of Gujarat under the provisions of the Gujarat Private Universities Act, 2009. It is a university committed to achieve Women's Empowerment through Quality Education, Skill Development, and by providing employment opportunities to its girl students through its model curriculum, integration of technology in pedagogy and best-in-class infrastructure. The focus is on prioritizing practical component and experiential learning supported through academia-industry linkages, functional MoUs, skill development training, internships etc. It aims at providing opportunities to the girl students for holistic development and self-reliance.

VISION

Empowerment of women through quality education and skill development, so as to make them strong pillars of stability in the society.

MISSION

To provide Education & Professional Training to all women for their all-round development, so as to enable them to become economically independent and socially empowered citizens.

2   SALIENT FEATURES

- Based on NEP-2020 & CBCS

- Interdisciplinary as well as multidisciplinary.

- Practical-oriented, skill-based & vocation-based.

- Based on experiential learning.

- Greater exposure to internship, hands-on training, project work, field work, presentation etc.

- Mode of teaching shall be Offline)

- Qualified & Competent Faculty Members for effective teaching-learning

- Employment-Generating

3   INTRODUCTION OF THE PROGRAM

Master of Science in Information Technology is an integrated program offered by VVWU, Surat in Academic Year 2023.This program has a five-years duration with two semesters per year. The program is designed to meet the growing demand for IT professionals who can effectively navigate and contribute to the rapidly evolving technological landscape.

4   OBJECTIVE OF THE PROGRAM

The objective of the program is to provide necessary knowledge skills and foundation for acquiring a wide range of career in to the rapidly expanding world of Information Technology. To make the students industry ready in reputed IT Companies.

5 PROGRAM OUTCOME (POs)

PO 1. **Enhancement of Fundamental Knowledge**

Program enables students to enhance the knowledge in the domains of core computer science and Information Technology (IT). It also makes students capable of using core concepts in the conceptualization of domain specific application development.

PO 2. **Development of Critical Thinking**

The program develops the skills of critical thinking, problem solving, evaluative learning of various techniques, and understanding the essence of the problem.

PO 3. **Advanced Emerging Technology and Industrial Awareness**

The program trains students with the latest technologies that is being used in the industry. The continuous syllabus review adds value to the program for the outgoing students and make them ready to face challenging demands of the industry.

PO 4. **Utilization of Advanced Tools**

The students are able to apply the knowledge of advanced tools to solve the real world problems.

PO 5. **Project Planning and Management Capabilities**

The program enables students for designing and conceptualizing the software architecture, planning and managing the product development process of complex and live software projects. It also makes students understand the decision making for selection of an appropriate project management capabilities.

PO 6. **Real World Problem / Project Development**

Real world project provides the candidates exposure to work in the challenging

and demanding environment training makes students employable and industry ready.

PO 7. **Team Work and Leadership Development**

Enables the students to work in a team and also to take leadership of the project management team.

6 PROGRAM SPECIFIC OUTCOMES (PSOs)

Upon completion of the Integrated M.Sc. IT program, the students would:

PSO 1. Students will learn to develop and strengthen the fundamental concepts that are required to solve complex programming problems.

PSO 2. Students can enable analyze identify and prepare physical solutions for the given challenges.

PSO 3. Students will be able to apply the concept of project management to solve a real-world problem using software engineering.

PSO 4. Students will be able to learn emerging technologies and apply them for the development of Web applications, Mobile application, etc.

PSO 5. Students will develop necessary Entrepreneur and Technical skills to start their own startup programs in the field of IT.

7 PROGRAM HIGHLIGHTS:

Program Level	Integrated				
Program	Master in Science Information Technology				
Duration	5 years (10 semesters)				
Examination Type	Semester system (1-10 semesters)				
Intake	300				
Eligibility	10 + 2 in Science stream with A, B or AB group or Commerce				
Mapping between POs and PSOs		PSO 1.	PSO 2.	PSO 3.	PSO 4.	PSO 5.
	PO 1.	▨				
	PO 2.	▨	▨			
	PO 3.		▨	▨		
	PO 4.				▨	▨
	PO 5.			▨	▨	▨
	PO 6.				▨	▨
	PO 7.			▨	▨	▨
Job Positions	Project Manager, IT Manager, System Analyst, Technical Leaders, Software Consultant, Database Designer, Database Administrator, Application Programmer, Network Planning Manager, etc.				

8   SCHEME OF ASSESSMENT

Following is the scheme of assessment followed by the university –

Weightage (%)	Credit	Continuous Comprehensive Evaluation (CCE) (50%)	Semester End Evaluation (SEE) (50%)
100%	4	[Internal Exam] **(20)** + [1. Assignments/2. Project Work/ 3. Field Work/4. QUIZ / 5. group discussion/6. Role Play/ 7. (Lab Record/Lab Performance/Lab Work)/ 8. (Seminar/Class Performance/Poster Presentation) / 9. Viva-Voice/ 10. Book Review or Article Review/ 11. Case Studies/ 12. Class Test/ 13. Report Writing/ 14. Any other as per the requirement of the subject] (Any Two) (Thread-01 + Thread-02) **(10 + 10)** + [Attendance] **(10)**	Semester End Evaluation (SEE) Theory Exams Whole Syllabus
100%	2	[Internal Exam] **(20 - Converted into 10 at the time of marks entry)** + [1. Assignments/2. Project Work/ 3. Field Work/4. QUIZ / 5. group discussion/6. Role Play/ 7. (Lab Record/Lab Performance/Lab Work)/ 8. (Seminar/Class Performance/Poster Presentation) / 9. Viva-Voice/ 10. Book Review or Article Review/ 11. Case Studies/ 12. Class Test/ 13. Report Writing/ 14. Any other as per the requirement of the subject] (Any One) (Thread-01) **(10)** + [Attendance] **(5)**	Semester End Evaluation (SEE) Theory Exams Whole Syllabus

9   CREDIT STRUCTURE

<table>
<tr><td colspan="10">5 Years Integrated M.Sc. IT Credit structure for 2024 - 25</td></tr>
<tr><td colspan="10">According to Curriculum and Credit Framework for Integrated Programs</td></tr>
<tr>
<th>Semester</th>
<th>Discipline Specific Course (Major)</th>
<th>Discipline Specific Elective (Minor)</th>
<th>Multi-Disciplinary</th>
<th>Ability Enhancement Course (AEC)</th>
<th>Skill Enhancement Course (SEC)</th>
<th>Value Added Courses (VAC)/IKS</th>
<th>Summer Internship/ Project/ Online Course</th>
<th>Dissertation</th>
<th>Total</th>
</tr>
<tr><td>1</td><td>8</td><td>4</td><td>4</td><td>2</td><td>2</td><td>2</td><td>0</td><td>0</td><td>22</td></tr>
<tr><td>2</td><td>8</td><td>4</td><td>4</td><td>2</td><td>2</td><td>2</td><td>0</td><td>0</td><td>22</td></tr>
<tr><td>3</td><td>12</td><td>0</td><td>4</td><td>2</td><td>2</td><td>2</td><td>0</td><td>0</td><td>22</td></tr>
<tr><td>4</td><td>12</td><td>4</td><td>0</td><td>0</td><td>2</td><td>2</td><td>0</td><td>0</td><td>22</td></tr>
<tr><td>5</td><td>12</td><td>8</td><td>0</td><td>2</td><td>2</td><td>0</td><td>0</td><td>0</td><td>22</td></tr>
<tr><td>6</td><td>12</td><td>4</td><td>0</td><td>0</td><td>4</td><td>0</td><td>0</td><td>0</td><td>22</td></tr>
<tr><td>Total</td><td>64</td><td>24</td><td>12</td><td>10</td><td>14</td><td>8</td><td>0</td><td>0</td><td>132</td></tr>
<tr><td>7</td><td>18</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>4</td><td>0</td><td>22</td></tr>
<tr><td>8</td><td>18</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>4</td><td>0</td><td>22</td></tr>
<tr><td>9</td><td>18</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>4</td><td>0</td><td>22</td></tr>
<tr><td>10</td><td>22</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>22</td></tr>
<tr><td>Total</td><td>76</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>12</td><td>0</td><td>88</td></tr>
<tr><td>Grand Total</td><td>140</td><td>24</td><td>12</td><td>10</td><td>14</td><td>8</td><td>12</td><td>0</td><td>220</td></tr>
<tr><td colspan="10">* If anyone wants to exit after 2nd/ 4th Sem and wants a certificate/Diploma respectively, should complete an internship of 4 credits (60 hrs.)</td></tr>
</table>

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SCHOOL OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE

INTEGRATED M.Sc. (IT)

SEMESTER 3

SYLLABUS

AS PER NEP-2020

W.E.F 2024-25

10 COURSE STRUCTURE – PAPER TITLES SEMESTER 3

Integrated Course structure for year – 2024-25								
Sem	Discipline Specific Course (Major)	Discipline Specific Elective (Minor)	Multi-Disciplinary	Ability Enhancement Compulsory (AEC)	Skill Enhancement Courses (SEC)	Value Added Courses (VAC) / IKS	Summer Internship/ Project/ Online Course	Dissertation
3	Data Structure and Algorithm (Theory) Data Structure and Algorithm (Practical) Object Oriented Programming (Theory) Object Oriented Programming (Practical) Advanced Web Application Designing (Theory) Advanced Web Application Designing (Practical)	NA	Statistical Methods Using R Programming	Communication Skills – I	Data and Communication Network - I	Indian Knowledge System - II	-	-

11 TEACHING AND EVALUATION SCHEME FOR INTEGRATED M.SC. (IT) ACADEMIC YEAR 2024-25

Semester	Course Code	Course Category	Course Title	Offering Department	Teaching Scheme				Examination Scheme														Total Marks	Total Credits
					Contact Hour			Total Credit	Theory						Practical									
					Theory	Practical	Total		Credit	CCE		SEE		CCE+SEE Passing	Credit	CCE		SEE		CCE+SEE Passing			
										Max.	Passing	Max.	Passing			Max.	Passing	Max.	Passing				
3	ITM205-2C	Discipline Specific Course (Major)	**Data Structure and Algorithm**	Computer Science	2	0	2	4	2	25	9	25	9	18	0	0	0	0	0	0	50	4
		Discipline Specific Course (Major) - Practical	**Data Structure and Algorithm**	Computer Science	0	4	4		0	0	0	0	0	0	2	25	9	25	9	18	50	
	ITM206-2C	Discipline Specific Course (Major)	**Object Oriented Programming**	Computer Science	2	0	2	4	2	25	9	25	9	18	0	0	0	0	0	0	50	4
		Discipline Specific Course (Major) - Practical	**Object Oriented Programming**	Computer Science	0	4	4		0	0	0	0	0	0	2	25	9	25	9	18	50	
	ITE207-2C	Discipline Specific Course (Major)	**Advanced Web Application Designing**	Computer Science	2	0	2	4	2	25	9	25	9	18	0	0	0	0	0	0	50	4

Code	Category	Course	Department																			
	Discipline Specific Course (Major) - Practical	**Advanced Web Application Designing**	Computer Science	0	4	4		0	0	0	0	0	0	2	25	9	25	9	18	50	
MDC203-2C	Multi-Disciplinary	**Statistical Methods Using R Programming**	Computer Science	4	0	4	4	4	50	18	50	18	36	0	0	0	0	0	0	100	4
AEC203-2C	Ability Enhancement Course (AEC)	**Communication Skills – I**	Computer Science	2	0	2	2	2	25	9	25	9	18	0	0	0	0	0	0	50	2
SEC203-2C	Skill Enhancement Courses (SEC)	**Data and Communication Network - I**	Computer Science	2	0	2	2	2	25	9	25	9	18	0	0	0	0	0	0	50	2
IKS202-2C	Value Added Courses (VAC) / IKS	**Indian Knowledge System - II**	Computer Science	2	0	2	2	2	25	9	25	9	18	0	0	0	0	0	0	50	2
			TOTAL	-	-	-	22	16	-	-	-	-	-	6	-	-	-	-	-	550	22

12 SYLLABUS: SEMESTER 3

VANITA VISHRAM WOMEN'S UNIVERSITY, SURAT
SCHOOL OF SCIENCE AND TECHNOLOGY
Department of Computer Science
5 years Integrated M.Sc. IT Program
SY B.Sc. IT
Semester III
ITM205-2C: Data Structure and Algorithm

Credit   4   **Contact Hours per week   2**

Outline of the Course:

Course type	Theory
Level of the Course	200-299 Intermediate-level
Course Category	Discipline Specific Course (Major)
Purpose of Course	● To study basic concepts of data structures which includes Stack, Queue, Linked lists and different Sorting and Searching Techniques. ● To introduce various data structures, storage representation of data & its implementation.
Course Objective	Enable students to understand ● Obtain detailed knowledge of Data Structure, its role and significance of data structures using computer programming. ● Data Storage & implementation of various data structures. ● Identify the problems and decide the use of data structures in application programs. ● Learn searching & sorting techniques for real world applications.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	April 2024
Pre-requisite	Problem-solving, system design, implementation skills and Programming language.
Teaching Methodology	Class Room Teaching, Discussion and Assignment
Medium of Instruction	English
Evaluation Method	50% Continuous Comprehensive Evaluation (CCE) 50% Semester End Evaluation (SEE)

Course Content:

Units	Particulars	% Weightage of Unit	Minimum Nos. of Hours
1	**Unit 1. Introduction to Data Structures** 1.1 Data Structure concept 1.2 Types of Data Structures primitive and non-primitive 1.3 Linear & Non-Linear Data Structures 1.4 Algorithm Specifications: Performance Analysis and Measurement	20%	07
2	**Unit 2. Linear Data Structures** 2.1 Stack: Stack-Definitions & Concepts, Operations on Stacks, Applications of Stacks, Polish & Reverse Polish Expression, Tower of Hanoi. 2.2 Queue: Representation of Queue, Operations on Queue, Types of Queues, Applications of Queue 2.3 Linked List: Singly Linked List, Doubly Linked list, Circular linked list, Applications of linked list.	30%	08
3	**Unit 3. Non-Linear Data Structures** 3.1 Tree-Definitions and Concepts, Representation of binary tree, Binary tree traversal, Binary search trees. 3.2 Graph-Matrix Representation of Graphs, Graph operations, (Breadth First Search, Depth First Search) 3.3 Difference between Tree & Graph, Application of Tree and Graph.	30%	08
4	**Unit 4. Searching and Sorting** 4.1 Sequential Search 4.2 Binary Search 4.3 Bubble Sort 4.4 Selection Sort 4.5 Merge Sort 4.6 Quick Sort	20%	07

REFERENCE

Core references:

1. An Introduction to Data Structures with applications,Trembley – Tata McGraw Hill.
2. Data Structures using C & C++ Tenenbaum- Prentice Hall
3. Data structures – A Programming Approach with C, Dharmender Singh Kushwaha and Arun Kumar Misra – PHI.

Reference books:

1. Fundamentals of Computer Algorithms E. Horowitz, Sahni, and S. Rajsekaran , Galgotia Publication
2. Expert Data Structure with C, R. B. Patel - Khanna Publication
3. Programming in C, Balaguruswami – TMH
4. Data & File Structure Rohit Khurana , Vikas Publication
5. Data Structure with C-An algorithm approach-Bharat Patel-Nikisha Jariwala-Benison Education
6. Data Structures using C- 2nd Edition- Reema Thareja- Oxford University Press.

COURSE OUTCOMES:

Upon successful completion of the course,

CO 1.	On completion of this course, student will understand the advanced concepts of data structure and analyses and understand the data types.
CO 2.	Student will be understand different concept of Data Structure such as stack, queue and link list.
CO 3.	Student understand different nonlinear concept such as Tree and Graph and also understand Graph-Matrix Representation.
CO 4.	Student will be able to search and sort in data structure.

COURSE OUTCOMES MAPPING

Unit No.	Title of the Unit	Course Outcomes			
		CO 1.	CO 2.	CO 3.	CO 4.
1	Introduction to Data Structures	▓			
2	Linear Data Structures		▓		
3	Non-Linear Data Structures			▓	
4	Searching and Sorting				▓

COURSE ARTICULATION MATRIX

	PSO 1.	PSO 2.	PSO 3.	PSO 4.	PSO 5.
CO 1.	▓	▓			
CO 2.				▓	▓
CO 3.			▓		
CO 4.		▓			

5 Years Integrated M.Sc. IT
Syllabus – 2024-25

VANITA VISHRAM WOMEN'S UNIVERSITY, SURAT
SCHOOL OF SCIENCE AND TECHNOLOGY
Department of Computer Science
5 years Integrated M.Sc. IT Program
SY B.Sc. IT
Semester III
Data Structure and Algorithm

Contact Hours per week   4

Outline of the Course:

Course type	Practical
Level of the Course	200-299 Intermediate-level
Course Category	Discipline Specific Course (Major) - Practical
Purpose of Course	**ITM205-2C: Data Structure and Algorithm** ● Practical implementation of the program covered as part of syllabus using required software and learning toorganize data using Data Structure like linear and non- liner. ● Understanding and learning basic concepts, stack, queue, Linked list and different sorting and searching techniques.
Course Objective	**ITM205-2C: Data Structure and Algorithm** ● Introduce students to the essentials of computer Programming and programming methodology using DataStructure. ● Data Storage and implementation of various DataStructures. ● Apply sorting and searching techniques for real world application
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	April 2024
Pre-requisite	Programming Language
Teaching Methodology	Lab work
Evaluation Method	50% Continuous Comprehensive Evaluation (CCE) 50% Semester End Evaluation (SEE)

COURSE OUTCOMES:

Upon successful completion of the course,

CO 1.	Student able to perform different concept such as Stack, Queue and Linked List
CO 2.	Student understand to perform different searching and sorting techniques

COURSE ARTICULATION MATRIX

	PSO 1.	PSO 2.	PSO 3.	PSO 4.	PSO 5.
CO 1.					
CO 2.					

5 Years Integrated M.Sc. IT
Syllabus – 2024-25

VANITA VISHRAM WOMEN'S UNIVERSITY, SURAT
SCHOOL OF SCIENCE AND TECHNOLOGY
Department of Computer Science
5 years Integrated M.Sc. IT Program
SY B.Sc. IT
Semester III
ITM206-2C: Object Oriented Programming

Credit   4   **Contact Hours per week   2**

Outline of the Course:

Course type	Theory
Level of the Course	200-299 Intermediate-level
Course Category	Discipline Specific Course (Major)
Purpose of Course	To studying basic about object oriented Fundamentals to explore concepts and develop skills of object-oriented programming.
Course Objective	Enable students to understand ● Differentiate between procedural and object oriented programming. ● Learn C++ as a language and various features of it. ● Learn Object Oriented principles and their application using C++.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	April 2024
Pre-requisite	NIL
Teaching Methodology	Class Room Teaching, Discussion and Assignment
Medium of Instruction	English
Evaluation Method	50% Continuous Comprehensive Evaluation (CCE) 50% Semester End Evaluation (SEE)

Course Content:

Units	Particulars	% Weightage of Unit	Minimum Nos. of Hours

1	**Unit 1. Introduction to Object Oriented Programming**
	1.1 Comparison of Procedural Programming and OOP
	1.2 Basic concept of OOP
	    1.2.1 Abstraction
	    1.2.2 Encapsulation
	    1.2.3 Inheritance
	    1.2.4 Polymorphism
	1.3 Inline Function
		20%	05

2	**Unit 2. Classes and Objects** 2.1 Introduction of Classes, Objects 2.2 Access controls concepts (Public, Private, Protected) 2.3 Constructors & Destructor 2.4 Dynamic Object Creation & Destruction.	20%	05
3	**Unit 3. Inheritance** 3.1 Inheritance 3.2 Types of Inheritance (Multi-Level Inheritance, Multiple Inheritance) 3.3 Constructors and Destructor Calls during Inheritance, Abstract Class 3.4 Friend Function	30%	10

4	**Unit 4. Polymorphism & Exception Handling**
	4.1 Static Polymorphism
	    4.1.1 Operator Overloading
	    4.1.2 Function Overloading and Type Conversion
	4.2 Dynamic Polymorphism (Virtual Functions, Pure Virtual Functions)
	4.3 Overriding
	4.4 Introduction to Exception, Try... Catch, Basics Exception Handling (using catch and throw, multiple catch statements)
		30%	10

5 Years Integrated M.Sc. IT
Syllabus – 2024-25

REFERENCE

Core references:
1. Programming in C, Balaguruswami – TMH
2. Let us C - 17th Edition, Yashavant Kanetkar, BPB Publication, Noida
3. C Language Programming – Byron Gottfried – TMH
4. The C Programming Language, Brian Kernigham & Dennis Ritchie, Prentice Hall Publications
5. C: The Complete Reference, Herbert Schildt, McGraw Hill Publications, Noida

Reference books:
1. HerbtzSchildt, "C++: The Complete Reference", Fourth Edition, McGraw Hill, 2003.
2. E Balaguruswamy, "Object Oriented Programming with C++", Tata McGraw-Hill Education, 2008.
3. Bjarne Stroustrup, "The C++ Programming Language", 4th Edition, Addison-Wesley, 2013

COURSE OUTCOMES:

Upon successful completion of the course,

CO 1.	On completion of this course, student will understand the concepts of Object Oriented Programming.
CO 2.	Ability to design class and develop Computer programs based on OOPs concepts.
CO 3.	Interprets the concept of inheritance and its types.
CO 4.	Understand the concept of polymorphism and Exception Handling.

COURSE OUTCOMES MAPPING

Unit No.	Title of the Unit	Course Outcomes			
		CO 1	CO 2	CO 3	CO 4
1	Introduction to Object Oriented Programming	▓			
2	Classes and Objects		▓		
3	Inheritance			▓	
4	Polymorphism & Exception Handling				▓

COURSE ARTICULATION MATRIX

	PSO 1.	PSO 2.	PSO 3.	PSO 4.	PSO 5.
CO 1.	▓				
CO 2.				▓	
CO 3.		▓	▓		
CO 4.		▓	▓		

5 Years Integrated M.Sc. IT
Syllabus – 2024-25

VANITA VISHRAM WOMEN'S UNIVERSITY, SURAT
SCHOOL OF SCIENCE AND TECHNOLOGY
Department of Computer Science
5 years Integrated M.Sc. IT Program
SY B.Sc. IT
Semester III
Object Oriented Programming

Contact Hours per week   4

Outline of the Course:

Course type	Practical
Level of the Course	200-299 Intermediate-level
Course Category	Discipline Specific Course (Major) – Practical
Purpose of Course	**ITM206-2C: Object Oriented Programming** ● Practical implementation of program covered as part of syllabus using required software and learning programming areas. ● Understanding and learning OOP's Concepts and Exception Handling.
Course Objective	**ITM206-2C: Object Oriented Programming** • Introduce students to the essentials of object-oriented programming using C++ language. • Apply various programming constructs.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	April 2024
Pre-requisite	Procedural Oriented Programming
Teaching Methodology	Lab work
Evaluation Method	50% Continuous Comprehensive Evaluation (CCE) 50% Semester End Evaluation (SEE)

EFFECTIVE FROM ACADEMIC YEAR 2024-25

COURSE OUTCOMES:

Upon successful completion of the course,

CO 1.	Students will able to solve problems using C++
CO 2.	Able to implement concept of reusability using classes and objects.
CO 3.	Able to understand the concept of abstract class and encapsulation.
CO 4.	Able to understand the concept of polymorphism and inheritance.

COURSE ARTICULATION MATRIX

	PSO 1.	PSO 2.	PSO 3.	PSO 4.	PSO 5.
CO 1.					
CO 2.					
CO 3.					
CO 4.					

5 Years Integrated M.Sc. IT
Syllabus – 2024-25

VANITA VISHRAM WOMEN'S UNIVERSITY, SURAT
SCHOOL OF SCIENCE AND TECHNOLOGY
Department of Computer Science
5 years Integrated M.Sc. IT Program
SY B.Sc. IT
Semester III
ITM207-2C: Advanced Web Application Designing

Credit   4   **Contact Hours per week   2**

Outline of the Course:

Course type	Theory
Level of the Course	200-299 Intermediate-level
Course Category	Discipline Specific Course (Major) – Theory
Purpose of Course	• Students can design dynamic web pages and web sites. • To put students in the orbit of this Internet driven world and to make them comfortable in developing various web based applications, this course is focusing on front-end and Back-end design.
Course Objective	• Students learn how to build, design and manage websites. • Students will learn about Web Terminologies.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	April 2024
Pre-requisite	The basics of HTML, Browser and Web page.
Teaching Methodology	Class Room Teaching, Discussion, Assignment and Project
Medium of Instruction	English
Evaluation Method	50% Continuous Comprehensive Evaluation (CCE) 50% Semester End Evaluation (SEE)

Course Content:

Units	Particulars	% Weightage of Unit	Minimum Nos. of Hours
1	**Unit 1. jQuery with HTML** 1.1 jQuery HTML DOM manipulation 1.2 jQuery set content - text(), html(), val() 1.3 jQuery add content - append(), perpend(),after(), before() 1.4 jQuery remove(),empty() 1.5 jQuery CSS 1.6 jQuery traversing	25%	06

2	**Unit 2. JSON(Javascript object notation) & AJAX**
	2.1 Concept and features of JSON
	2.2 JSON data types
	2.3 JSON objects and array
	2.4 Fundamentals of AJAX technology:
	   2.4.1 Difference between Synchronous and Asynchronous web application
	   2.4.2 XMLHttpRequest
	2.5 Properties:(onReadyStateChange, eadyState, responseText, responseXML)
	2.6 XMLHttpRequestMethods:(Open(), send(), setRequestHeader())
		25%	10

3	**Unit 3. Fundamental of UI & UX** 3.1 Basics of UI & UX 3.2 Relationship between UI & UX 3.3 Good and poor design characteristics of UI & UX	20%	04

4	**Unit 4. UI & UX Tools**
	4.1 Fundamental of Figma
	   4.1.1 Introduction
	   4.1.2 Create new file & designing a grid(for web and app)
	4.2 Importing & Cropping Photos
	4.3 Vector Graphics, Colors, Shadows
	4.4 Text Styles in sketch figma
	4.5 Creating, editing, & organizing text styles
		30%	10

REFERENCE

Core references:

1. HTML Black Book, Steven Holzner, Dreamtech Press
2. JavaScript by Examples, Dani Akash, Packt
3. HTML & CSS: Design and Build Web Sites, Jon Duckett, Wiley
4. Step by Step Bootstrap 3: A Quick Guide to Responsive Web Development Using Bootstrap 3, Riwanto Megosinarso Kindle Edition

Reference books:

1. HTML 5 Black Book (Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP, jQuery) 2Ed. Paperback – 2016 by DT Editorial Services (Author)
2. Web Design with HTML, CSS, JavaScript and jQuery Set Paperback – 15 Aug 2014 by Jon Duckett (Author)

Web contents:

1. https://getbootstrap.com/docs/5.3/getting-started/introduction/
2. https://api.jquery.com/
3. https://api.jquery.com/jQuery.ajax/
4. https://www.figma.com/ux-design-tool/

COURSE OUTCOMES:

Upon successful completion of the course,

CO 1.	After studying fundamental of web design with bootstrap students can understand design components
CO 2.	Students are enable to develop dynamic web pages in Bootstrap, HTML, CSS.
CO 3.	Students can apply web design knowledge and create dynamic web pages using jquery and AJAX.
CO 4.	Students can understand regarding UI & UX design and develop design in figma.

5 Years Integrated M.Sc. IT
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COURSE OUTCOMES MAPPING

Unit No.	Title of the Unit	Course Outcomes			
		CO 1.	CO 2.	CO 3.	CO 4.
1	jQuery with HTML	░			
2	JSON(Javascript object notation) & AJAX		░		
3	Fundamental Of UI & UX			░	
4	UI & UX Tools				░

COURSE ARTICULATION MATRIX

	PSO 1.	PSO 2.	PSO 3.	PSO 4.	PSO 5.
CO 1.				░	
CO 2.		░			
CO 3.	░	░			
CO 4.			░		░

5 Years Integrated M.Sc. IT
Syllabus – 2024-25

VANITA VISHRAM WOMEN'S UNIVERSITY, SURAT
SCHOOL OF SCIENCE AND TECHNOLOGY
Department of Computer Science
5 years Integrated M.Sc. IT Program
SY B.Sc. IT
Semester III
Advanced Web Application Designing

Contact Hours per week   4

Outline of the Course:

Course type	Practical
Level of the Course	200-299 Intermediate-level
Course Category	Discipline Specific Course (Major) – Practical
Purpose of Course	**ITM207-2C: Advanced Web Application Designing** ● Students can design dynamic web pages and web sites. ● To put students in the orbit of this Internet driven world and to make them comfortable in developing various web based applications, this course is focusing on front-end and Back-end design.
Course Objective	**ITM207-2C: Advanced Web Application Designing** ● Students learn how to build, design and manage websites. ● Students will learn about Web Terminologies.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	April 2024
Pre-requisite	The basics of HTML, Browser and Web page.
Teaching Methodology	Lab work
Medium of Instruction	English
Evaluation Method	50% Continuous Comprehensive Evaluation (CCE) 50% Semester End Evaluation (SEE)

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COURSE OUTCOMES:

Upon successful completion of the course,

CO 1.	After studying fundamental of web design with bootstrap students can design dynamic website using jQuery.
CO 2.	Students are enable to manage the data using JSON and AJAX
CO 3.	Students can understand regarding user Interface and user experience
CO 4.	Students can develop UI & UX design using figma

COURSE ARTICULATION MATRIX

	PSO 1.	PSO 2.	PSO 3.	PSO 4.	PSO 5.
CO 1.					
CO 2.					
CO 3.					
CO 4.					

5 Years Integrated M.Sc. IT
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VANITA VISHRAM WOMEN'S UNIVERSITY, SURAT
SCHOOL OF SCIENCE AND TECHNOLOGY
Department of Computer Science
5 years Integrated M.Sc. IT Program
SY B.Sc. IT
Semester III
MDC203-2C: Statistical Methods Using R Programming

Credit   4   Contact Hours per week   4

Outline of the Course:

Course type	Theory
Level of the Course	200-299 Intermediate-level
Course Category	Discipline Specific Course (Major)
Purpose of Course	To study advance concepts about computer programming to explore and develop detail skills of programming.
Course Objective	Enable students to understand • Introduce students to the essentials of computer Programming and programming methodology using structure, Union, Pointers, User Defined Functions and File management of C language. • Apply various advanced programming constructs. • Understand library and user defined functions.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	April 2024
Pre-requisite	Basic Concepts of Statistics, and Programming in C
Teaching Methodology	Class Room Teaching, Discussion and Assignment
Medium of Instruction	English
Evaluation Method	50% Continuous Comprehensive Evaluation (CCE) 50% Semester End Evaluation (SEE)

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Course Content:

Units	Particulars	% Weightage of Unit	Minimum Nos. of Hours
1	**Unit 1. Statistical Data and Descriptive Statistics** 1.1 Nature and Classification of Data 1.2 Measures of Central Tendency: Mean, Median, Mode, Geometric Mean, and Harmonic Mean 1.3 Measures of Deviation – Range, Mean Deviation, Standard Deviation 1.4 Skewness, Moments, Kurtosis	25%	12

2	**Unit 2. Probability, Probability Distributions**
	2.1 Theory of Probability
	2.2 Probability Distribution:
	    2.2.1 Binomial
	    2.2.2 Poisson
	    2.2.3 Normal
		25%	12

3	**Unit 3. Correlation and Regression Analysis**
	3.1 Positive Correlation, Negative Correlation, Zero Correlation, Karl Pearson's Correlation Coefficient
	3.2 Linear Regression
	3.3 Non-Linear Regression Models :
	    3.3.1 Second Degree Curve
	    3.3.2 Growth Curve
		25%	12

4	**Unit 4. Introduction to R Programming** 4.1 Basic Syntax 4.2 Data types 4.3 Variables 4.4 Operators	10%	04
5	**Unit 5. Control Structures, Functions and Case Study** 5.1 R-functions, Vectors, Lists, and Arrays 5.2 Control statements 5.3 Practical based on various Statistical Techniques	15%	10

REFERENCE
Core references: 1. Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying Ye, Probability & Statistics for Engineers & Scientists, 9th Ed. Pearson Publishers. 2. S C Gupta and V K Kapoor, Fundamentals of Mathematical statistics, Khanna publications. 3. Norman Matloff, The Art of R Programming - A Tour of Statistical Software Design, No Starch Press **Reference books:** 1. Sheldon M Ross, Probability and statistics for Engineers and scientists, Academic Press 2. Anderson, Sweeney, Williams, "Statistics for business and economics", 9th edition 3. Hadley Wickham and Garrett Gorlemund, R for Data Science, by O'Reilly

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COURSE OUTCOMES:

Upon successful completion of the course,

CO 1.	Understand the Central tendency, Standard Deviation
CO 2.	Understand the terminologies of basic probability, two types of random variables and their probability functions
CO 3.	Understand the Regression and apply the statistics for testing the significance of the given large and small sample data by using t- test, F- test and Chi-square test
CO 4.	Understand the Open Source R Programming Language and its structure
CO 5.	Understand the Control Structure, Functions of R Programming

COURSE OUTCOMES MAPPING

Unit No.	Title of the Unit	Course Outcomes				
		CO 1.	CO 2.	CO 3.	CO 4.	CO 5.
1	Statistical Data and Descriptive Statistics	▓				
2	Probability, Probability Distributions		▓			
3	Correlation and Regression Analysis			▓		
4.	Introduction to R Programming				▓	
5.	Control Structures, Functions and Case Study					▓

COURSE ARTICULATION MATRIX

	PSO 1.	PSO 2.	PSO 3.	PSO 4.	PSO 5.
CO 1.	▓	▓			
CO 2.				▓	
CO 3.					▓
CO 4.			▓		
CO 5.		▓			

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VANITA VISHRAM WOMEN'S UNIVERSITY, SURAT
SCHOOL OF SCIENCE AND TECHNOLOGY
Department of Computer Science
5 years Integrated M.Sc. IT Program
SY B.Sc. IT
Semester III
AEC203-2C: Communication Skills – I

Credit   2   **Contact Hours per week   2**

Outline of the Course:

Course type	Theory
Level of the Course	200-299 Intermediate-level
Course Category	Ability Enhancement Course
Purpose of Course	To enhance students' understanding and proficiency in various aspects of communication skills as a subject.
Course Objective	- To make students aware of fundamentals of communication skills - To develop proficiency in communication skills - To cultivate reflective communication practices
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	April 2024
Pre-requisite	Elementary knowledge of English Language
Teaching Methodology	Class Room Teaching, Discussion and Assignment
Medium of Instruction	English
Evaluation Method	50% Continuous Comprehensive Evaluation (CCE) 50% Semester End Evaluation (SEE)

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COURSE OUTCOMES:

Upon successful completion of the course,

CO 1.	Demonstrate improved proficiency in communication by articulating ideas clearly, concisely, and confidently in various contexts.
CO 2.	Develop active listening and reading skills.
CO 3.	Exhibit enhanced skills in summarizing, paraphrasing, note taking in a comprehensive manner.

COURSE OUTCOMES MAPPING

Unit No.	Title of the Unit	Course Outcomes		
		CO 1.	CO 2.	CO 3.
1	Introduction to Communication	▨		
2	Listening Skills		▨	▨
3	Reading Skills		▨	▨

COURSE ARTICULATION MATRIX

	PSO 1.	PSO 2.	PSO 3.	PSO 4.	PSO 5.
CO 1.		▨			
CO 2.				▨	
CO 3.				▨	
CO 4.	▨	▨			
CO 5.		▨			▨

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SY B.Sc. IT
Semester III
SEC203-2C: Data and Communication Network - I

Credit   2   **Contact Hours per week   2**

Outline of the Course:

Course type	Theory
Level of the Course	200-299 Intermediate-level
Course Category	Skill Enhancement Course (SEC)
Purpose of Course	To learn the various types of networks and layers and it's protocols and network devices features
Course Objective	- Become familiar with layered communication architectures (OSI and TCP/IP). - Understand the client/server model and key application layer protocols. - Understand the concepts of reliable data transfer and how TCP implements these concepts. - Get familiar with emerging networking trends and Tools - Learn the principles of routing and the semantics and syntax of IP. - Familiarity with the essential protocols of computer networks, and how they can be applied in network design and implementation.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	April 2024
Pre-requisite	NIL
Teaching Methodology	Class Room Teaching, Discussion and Assignment
Medium of Instruction	English
Evaluation Method	50% Continuous Comprehensive Evaluation (CCE) 50% Semester End Evaluation (SEE)

Course Content:

Units	Particulars	% Weightage of Unit	Minimum Nos. of Hours
1	**Unit 1. Introduction of Computer Network** 1.1 Introduction 1.2 History and development of computer networks 1.3 Networks topologies 1.4 Open System Interconnection (OSI)	25%	09
2	**Unit 2. Network & Transport Layer Protocols** 2.1 Introduction to IPV4 and IPV6 2.2 ARP, DHCP, ICMP 2.3 UDP,TCP	30%	09
3	**Unit 3. Application Layer** 3.1 FTP 3.2 DNS 3.3 Firewall	20%	06
4	**Unit 4. Network Devices** 4.1 Router 4.2 Switches 4.3 Gateway 4.4 Hub	25%	06

REFERENCE

Core references:

1. Computer Networks Andrew S Tannebaum & David J Wetherall, Pearson, 2012.
2. Data Communication & Networking, Forouzen, Tata McGraw Hill.

Reference books:

1. Data & Computer Communication, Williams Stallings, Prentice Hall of India.
2. Information Technology Today, S. Jaiswal, Galgotia Publications.
3. F. Halsall, "Data Communications, Computer Networks and Open Systems", Pearson Education2008.
4. D. Bertsekas and R. Gallagher, "Data Networks", PHI 2008, 2nd Edition.

COURSE OUTCOMES:

Upon successful completion of the course,

CO 1.	Gain the knowledge of basic computer network technology and the functions of each layer in the OSI reference model.
CO 2.	Obtain the skills of IP and routing mechanisms.
CO 3.	Familiarity with the essential protocols of computer networks TCP and UDP.
CO 4.	To familiarize the student with security and protocols.

COURSE OUTCOMES MAPPING

Unit No.	Title of the Unit	Course Outcomes			
		CO 1.	CO 2.	CO 3.	CO 4.
1	Introduction of Computer Network				
2	Network & Transport Layer Protocols				
3	Application Layer				
4	Network Devices				

COURSE ARTICULATION MATRIX

	PSO 1.	PSO 2.	PSO 3.	PSO 4.	PSO 5.
CO 1.					
CO 2.					
CO 3.					
CO4.					

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Semester III
IKS202-2C: Indian Knowledge System - II

Credit   2   **Contact Hours per week   2**

Outline of the Course:

Course type	Theory
Level of the Course	200-299 Intermediate-level
Course Category	Indian Knowledge System
Purpose of Course	Acknowledgment of Indian Knowledge System, Scientific Indian Heritage & Art and Culture, Health & Wellness.
Course Objective	Enable students to understand • Basic Information about IKS.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	April 2024
Pre-requisite	NIL
Teaching Methodology	Class Room Teaching, Discussion and Assignment
Evaluation Method	50% Continuous Comprehensive Evaluation (CCE) 50% Semester End Evaluation (SEE)

Course Content:

Units	Particulars	% Weightage of Unit	Minimum Nos. of Hours
1	**Unit 1. Understanding of Indian Knowledge System** 1.1 Unique aspects of IKS-Idea vs Ideology,IKS in Present Perspective 1.2 Vocabulary related to IKS-Dharma, Sanatan, Moksha, Karma 1.3 The IKS Corpus-A Classification Framework	40%	15
2	**Unit 2. The Vedic Corpus** 2.1 Introduction to Vedas 2.2 The Four Vedas 2.3 Vedic Life: Distinctive Features	20%	03
3	**Unit 3. Wisdom through the ages** 3.1 Puranas 3.2 Itihas as a source of wisdom of our Granthas 3.3 Nitishastra	40%	12

REFERENCE
Reference books: 1. B. Mahadevan, Vinayak Rajat Bhat, Nagendra Pavana R.N. 2. R.M. Pujari, Pradeep Kolhe, N. R. Kumar, 'Pride of India: A Glimpse into India's Scientific Heritage', Samskrita Bharati Publication. 3. 'Indian Contribution to science', compiled by Vijnana Bharati.

COURSE OUTCOMES:

Upon successful completion of the course,

CO 1.	On completion of this course students can understand about Indian Knowledge System
CO 2.	Students gain knowledge about the Vedic corpus, wisdom of our Granthas
CO 3.	Students gain knowledge about Puranas ,Nitishastra

COURSE OUTCOMES MAPPING

Unit No.	Title of the Unit	Course Outcomes		
		CO 1.	CO 2.	CO 3.
1	Understanding of Indian Knowledge System			
2	The Vedic Corpus			
3	Wisdom through the ages			

COURSE ARTICULATION MATRIX

	PSO 1.	PSO 2.	PSO 3.	PSO 4.	PSO 5.
CO 1.					
CO 2.					
CO 3.					

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13 TEACHING METHODOLOGY

A teaching method comprises the principles and methods used by teachers to enable student learning. In order to achieve its objective of focused process- based learning and holistic development, the teacher/faculty may use a variety of knowledge delivery methods:

13.1 LECTURES/CLASS WORKS:

Lectures should be designed to provide the learners with interesting and fresh perspectives on the subject matter. Lectures should be interactive in a way that students work with their teachers to get new insights in the subject area, on which they can build their own bridges to higher learning. Classwork has the ability to enhance relationships between teachers and students. Create goal- oriented tasks for students to prepare and enable self-learning.

13.2 DISCUSSIONS/ SEMINARS/PRESENTATION:

Discussions / seminars / presentation are critical components of learning and can be used as a platform for students to be creative and critical with old and new ideas. Besides developing critiquing skills, arriving at consensus on various real-life issues and discussion groups lead to innovative problem-solving and ultimately to success.

13.3 CASE STUDIES/ SELF-STUDY:

Real case studies, wherever possible, should be encouraged in order to challenge students to find creative solutions to complex problems of individual, community, society and various aspects of knowledge domain concerned. Technology is transforming higher Education learning and teaching though various case studies to improve overall standards.

13.4   PRACTICAL/PROBLEM SHEET:

Practical ability is the essential requirement for computer science undergraduates' ability structure, and it emphasizes that computer science undergraduates should have a good grasp of theory from practice and then apply the theory to practice, improving them own software developing skills and employ ability.

13.5   ASSIGNMENTS:

Computer science assignments not only help students overcome their fear and stress but also help them learn more interesting facts about the subjects of computer science which are part of their syllabus and also out of curriculum.

13.6   INDUSTRIAL TOURS:

Computer Science students have to know the things practically through interaction, working methods and employment practices. Moreover, it gives exposure from academic point of view. Main aim industrial visit is to provide an exposure to students about practical working environment.

13.7   TEAM WORK:

Teamwork based projects challenge the student to apply the technical knowledge they gain in college to solve meaningful and complex problems. Positive collaboration in the form of team work is critical in the classroom environment, for which it is necessary to transcend one's prejudices and predilections so as to achieve the desired outcomes. In the process of team work, learners will acquire the skills of managing knowledge acquisition and other collaborative learners, thereby understanding how to incorporate and balance personalities.

14 KEYWORDS

- Master of Science in Information Technology
- Basics of Computers
- Office Automation
- Operating System
- Web Development
- Programming Concept
- Database-backend tool
- Web Designing
- Statistical analysis
- Internet
- Algorithms
- Software analysis, coding, design, testing
- Mobile Computing
- Cyber Security
- IT Projects
- Network fundamentals
- Framework
- Frontend tools
- Animation
- Graphics fundamentals
- Full Stack Development
- Digital Electronics
- Troubleshooting