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#### SARDAR PATEL UNIVERSITY Vallabh Vidyanagar, Gujarat (Reaccredited with 'A' Grade by NAAC (CGPA 3.11) Syllabus with effect from the Academic Year 2024-2025

Course Code	US03MABIT01	Title of the Course	Object Oriented Programming using C++
Total Credits of the Course	4	Hours per Week	4

Course	1. T	o study	the	fundamental	concepts	and	constructs	of	the	C++
Objectives:	programming language									
_	2. T	o learn the	e basi	ic concepts of	object-orier	nted p	rogramming	usii	ng C+	-+.

Cours	se Content	
Unit	Description	Weightage*
	-	(%)
1.	<b>Object Oriented Programming (OOP) Concepts and Introduction</b>	25
	to C++	
	<ul> <li>Structured programming vs. object oriented programming</li> </ul>	
	- Basic OOP concepts : objects , classes , encapsulation, data hiding,	
	inheritance, polymorphism	
	- Introduction to C++: structure of a C++ program , data types,	
	variables, constants, expressions, statements and operators	
	<ul> <li>Usage of header files</li> </ul>	
	- Control flow statements : if else, for loop, while loop, do while	
	loop, switch, break and continue	
2.	Input/Output, Arrays and Working with Classes	25
	- Basic I/O in C++	
	- Arrays in C++ : introduction, declaration, initialization of one, two	
	and multidimensional arrays, operations on arrays	
	– Working with strings : introduction, declaration,	
	string manipulation and arrays of string	
	<ul> <li>Classes and objects in C++</li> </ul>	
	– Constructors : default, parameterized, copy constructor	
	overloading and destructor	
	<ul> <li>Access specifiers, implementing and accessing class members</li> </ul>	
	- Working with objects : constant objects, nameless objects, live	
	objects, arrays of objects	





3.	Functions, Function Overloading and Inheritance	25
	– Introduction to functions, library and user-defined functions,	
	default arguments	
	- Functions overloading , inline functions, friend functions and virtual functions	
	<ul> <li>Inheritance: Introduction, derived class declaration, forms of inheritance and member access ability, constructor and destructor in derived class, construction invocation and data member initialization</li> </ul>	
		• -
4.	Operator Overloading	25
	<ul> <li>Operator overloading : Introduction</li> </ul>	
	<ul> <li>Overloaded operators</li> </ul>	
	<ul> <li>Unary operator overloading, operator keyword, operator return values,</li> </ul>	
	<ul> <li>Binary operators overloading,</li> </ul>	
	<ul> <li>Overloading with friend function</li> </ul>	
	<ul> <li>Dynamic memory allocation</li> </ul>	

Teaching- Learning Methodology	Blended teaching a	learning as well as	approach usage of IC	incorporating T tools.	both	traditional	classroom
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Evaluation Pattern				
Sr. No.	Details of the Evaluation	Weightage		
1.	Internal Examination	50%		
2.	University Examination	50%		

Cou	Course Outcomes: Having completed this course, the learner will be able to					
1.	apply the knowledge of the fundamental concepts and constructs of the C++ programming language.					
2.	carry out object-oriented programming using C++.					





Suggested	References:
Sr.No.	References
1.	E Balagurusamy : Object Oriented Programming in C++, Tata McGraw-Hill Publishing Co. Ltd.
2.	Robert Lafore : Object Oriented Programming in Turbo C++, Guide, Galgotia Pub. (P) Ltd.
3.	Barkakati N. : Object Oriented Programming in C++, PHI. OOP's using C++ for Dummies.

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Course Code	US03MABIT02	Title of the Course	Database Management Systems - I
Total Credits of the Course	4	Hours per Week	4

Course Objectives:	<ol> <li>To study basic concepts related to DBMS, Data Models and Relational Data Model terminologies.</li> <li>To learn basics of SQL data types, SQL statements and concepts like DML, DDL, DCL, TCL</li> <li>To work with tables, applying and modifying constraints, functions, joins queries.</li> </ol>
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Cours	se Content	
Unit	Description	Weightage*
		(%)
1.	Introduction to DBMS and Relational Database Design	25
	- Basics of Database and DBMS (Data, Information, field, record,	
	file)	
	<ul> <li>Three level Architecture of Database- external, conceptual and internal</li> </ul>	
	– Data Models concepts: Hierarchical, Network and Relational	
	<ul> <li>Relation data models concept, terminologies: tuple, attribute, domain, relation (Definition)</li> </ul>	
	<ul> <li>Relationships and Relationship types</li> </ul>	
	<ul> <li>Keys: Introduction: super key, candidate key, primary key, alternate key, foreign key</li> </ul>	
	– Dr. E.F. Codd Rules	
	- Consequences of Poor database design and Functional dependencies	
	<ul> <li>Difference between DBMS and RDBMS</li> </ul>	
	- Normal Forms: 1st Normal Form, 2nd Normal Form, 3rd Normal	
	Form	
	<ul> <li>Examples of normalization</li> </ul>	





2.	Structured Query Language-1	2
	- SQL - introduction, advantages and disadvantages	5
	– Data types	
	- Types of SQL Statements : DDL DML, DCL, TCL	
	- Working with SQL*Plus - overview and basic commands of SQL	
	Plus.	
	<ul> <li>Tables: Creation, Removal and Alteration</li> </ul>	
	- Table Data: insertion, selection, updation, deletion	
	<ul> <li>Filtering data using WHERE clause, ordering using ORDER BY</li> </ul>	
	– Pseudo Columns – ROWID, ROWNUM, USER, UID, SYSDATE	
	- Transaction control language statements - COMMIT, ROLLBACK	
	and SAVEPOINT	
3.	Structured Query Language-2	2
	- Operators - Arithmetic, Relational, Logical, Range Searching,	5
	Pattern Matching	
	<ul> <li>Null Values, Tab Table, Dual Table</li> </ul>	
	<ul> <li>Data Constraints and its types</li> </ul>	
	<ul> <li>Modifying Constraints and Use of User_Constraints</li> </ul>	
	- Functions - Introduction, Types of Functions (Scalar And	
	Aggregate)	
	– Scalar : Numeric Functions , Character Functions, Date Functions	
	Conversion Functions	
	<ul> <li>Aggregate Functions : Avg, Count, Max, Min, Sum</li> </ul>	
4.	Structured Query Language-3	2
	<ul> <li>Grouping using GROUP BY and HAVING</li> </ul>	5
	<ul> <li>Subquery and its types</li> </ul>	
	<ul> <li>Joining tables, Types of joins</li> </ul>	
	- Creation and manipulation of database objects - indexes, views,	
	sequences	
	<ul> <li>Data control language statements – GRANT and REVOKE</li> </ul>	
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Examination	50%
2.	University Examination	50%

Cou	rse Outcomes: Having completed this course, the learner will be able to
1.	understand the basic concepts associated with DBMS, Data Models and Relational Data Model terminologies.
2.	understand the basics of SQL data types, SQL statements and concepts like DML, DDL, DCL, TCL.
3.	gain knowledge on tables, applying and modifying constraints, functions, joins queries.

Suggested References:		
Sr. No.	References	
1.	Bipin C. Desai, An introduction to Database Systems, Galgotia Publications Pvt. Ltd., 2010.	
2.	Ivan Bayross, SQL,PL/SQL The programming language of Oracle, 4th edition, BPB Publications, 2010.	
3.	S. Parthsarthy and B.W.Khalkar, Understanding Database Management Systems, First edition, Master Academy, 2007.	

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# B.Sc.(IT) (Bachelor of Science in Information Technology) B.Sc.(IT) Semester–III

Course Code	US03MABIT03	Title of the Course	Practical based on US03MABIT01 and US03MABIT02
Total Credits of the Course	4	Hours per Week	8

Course	1. To understand the practical usage of data structures.
Objectives:	2. To understand the practical usage of Database Management Systems.

Course Content		
	Description	Weightage* (%)
	PART-A : Practical based on US03MABIT01	50%
	PART-B : Practical based on US03MABIT02	50%

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Evaluation	50%
2.	University Examination	50%

Cou	rse Outcomes: Having completed this course, the learner will be able to
1.	apply the knowledge of data structures.
2.	apply the knowledge of Database Management Systems.





Course Code	US03IDBIT04	Title of the Course	Introduction to Scripting Language
Total Credits of the Course	2	Hours per Week	2

Course	1. To learn the basic concepts associated with scripting.
Objectives:	2. To understand fundamentals regarding JavaScript development.

Cours	se Content	
Unit	Description	Weightage* (%)
1.	<ul> <li>Basics of JavaScript <ul> <li>JavaScript basics : Syntax, Data Types, Variables, Literals, Type Casting, Operators</li> <li>User interaction through dialog boxes</li> <li>Built-in functions</li> <li>Flow Control statements: Decision-Making and Looping</li> <li>Arrays</li> <li>User-defined functions,</li> </ul> </li> </ul>	50
2.	<ul> <li>Advanced JavaScript–II</li> <li>String Object (length, charAt, indexOf, substr, toLowerCase, toUpperCase),</li> <li>Math Object (PI, abs, ceil, floor, max, mm, round)</li> <li>Date Object (getDate, getDay, getFullYear, getMonth, getTime, getHours, getMinutes, getSeconds, setDate, setFullYear, setMonth, setTime, setHours, setMinutes, setSeconds)</li> <li>Introduction to Document Object Model (DOM), DOM Hierarchy, Understanding objects &amp; Collections m DOM, HTML Form Hierarchy</li> <li>Accessing Form elements (Text, Radio, Checkbox, Dropdown, Button), Event handling</li> </ul>	50

Teaching-Learning	Blended learning approach incorporating both traditional classroom
Methodology	teaching as well as usage of ICT tools.





Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Examination	50%
2.	University Examination	50%

Course Outcomes: Having completed this course, the learner will be able to		
1.	understand the basic concepts regarding scripting.	
2.	understand the role of JavaScript in Web Application Development.	

Suggested References:			
Sr. No.	References		
1.	Ivan Bayross, "Web Enabled Commercial Applications Development using HTML, DHTML, Javascript, Perl CGI", BPB, 2004.		
2.	Douglas E Comer, The Internet, PHI, Second Edition, May 2000.		
3.	Xavier C., World Wide Web Design with HTML, Tata McGraw Hill Publication, 2000.		
4.	Eric Meyer, Cascading Style Sheets – The Definitive Guide, O'Reilly – SPD, First Edition, 2000.		
5.	Jeremy Keith, HTML 5 for Web Designers, 2005.		
6.	Manuals of suitable packages.		
7.	FaitheWempen, Step by Step HTML5, PHI, 2010.		
8.	Thomas A. Powell, HTML& CSS: The Complete Reference, Fifth Edition, Tata McGraw-Hill, 2010.		

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# B.Sc.(IT) (Bachelor of Science in Information Technology) B.Sc.(IT) Semester–III

Course Code	US03IDBIT05	Title of the Course	Introduction to Scripting Language Lab
Total Credits of the Course	2	Hours per Week	4

Course Objectives:	<ol> <li>To study practical use of scripting.</li> <li>To provide basic knowledge on practical usage of JavaScript in Web</li> </ol>
	Application Development.

Course Content		
	Description	Weightage* (%)
	Practical Based on US03IDBIT04 (Introduction to Scripting Language)	100%

Teaching- Learning Methodology	Practical-based learning in small groups and hands-on training through required ICT tools.
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Examination	50%
2.	University Examination	50%

Course Outcomes: Having completed this course, the learner will be able to		
1.	gain practical knowledge on scripting.	
2.	gain practical knowledge on JavaScript in Web Application Development.	





Course Code	US03AEBIT06	Title of the Course	Discrete Mathematics
Total Credits of the Course	2	Hours per Week	2

Course	1. To study the basic concepts of Vectors and Matrices.
Objectives:	2. To understand fundamental concepts related to graph theory.

Course Content		
Unit	Description	Weightage* (%)
1.	<ul> <li>Vectors and Matrices</li> <li>Dot product and Norm</li> <li>Matrix addition and scalar multiplication</li> <li>Matrix multiplication</li> <li>Transpose of matrix</li> <li>Square matrices: Diagonal, upper, lower triangular, symmetric, skew symmetric, orthogonal.</li> <li>Determinants up to order.</li> </ul>	50
2.	<ul> <li>Graph Theory</li> <li>Definition of graph, multigraph</li> <li>Degree of vertex, paths, subgraph, connected components</li> <li>Cut point, bridge</li> <li>Special graphs: complete, regular, bipartite.</li> <li>Matrices and graphs</li> <li>Planar graphs, maps and regions</li> <li>Euler's formula</li> <li>Colored graphs</li> </ul>	50

Teaching-	Blended	learning	approach	incorporating	both	traditional	classroom
Learning	teaching a	as well as	usage of IC	T tools.			
Methodology	_						





Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Examination	50%
2.	University Examination	50%

Cou	Course Outcomes: Having completed this course, the learner will be able to		
1.	understand the basic concepts related to Vectors and Matrices.		
2.	understand the fundamental concepts about graph theory.		

Suggested References:		
Sr. No.	References	
1.	S. Lipschutz and Marc Lars Lipson, Discrete Mathematics, Schaum's series, 2007.	
2.	Kenneth H. Rosen, Discrete Mathematics and its applications, 2017.	
3.	Jacob T. Schwartz, Introduction to Matrices and vectors, 2003.	
4.	Vinay Kumar, Discrete Mathematics, BPB Publication, First edition, 2002.	
5.	S. C. Gupta, Fundamentals of Statistics, Himalaya Publishing House, 2004.	

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Course Code	US03SEBIT07	Title of the Course	System Analysis and Design
Total Credits of the Course	2	Hours per Week	2

Course Objectives:	<ol> <li>To understand the concepts of System and System Development Life Cycle (SDLC).</li> <li>To impart knowledge on fact finding techniques, input/output design and Data Flow Diagrams.</li> </ol>
	Data 110W Diagrams.

Cours	Course Content		
Unit	Description	Weightage*	
		(%)	
1.	Concepts of System and System Development Life Cycle (SDLC)	50	
	<ul> <li>Introduction to the concept of a system with examples</li> </ul>		
	<ul> <li>Elements and characteristics of systems</li> </ul>		
	<ul> <li>Types of systems</li> </ul>		
	<ul> <li>Introduction to System Analysis</li> </ul>		
	<ul> <li>Role of a System Analyst</li> </ul>		
	<ul> <li>Introduction to System Life Cycle (SDLC)</li> </ul>		
	– System Analysis: Problem Identification, Feasibility study,		
	System requirement analysis		
	– System Design: System design specification and programming,		
	System implementation, follow up and maintenance, testing and		
	evaluation		





2.	Fact Finding Techniques, Input/Output Design and DFDs	50
	<ul> <li>Introduction and need of Fact Finding Techniques</li> </ul>	
	<ul> <li>Fact Gathering Techniques : Interviewing, Questionnaires, Record</li> </ul>	
	<ul> <li>Inspection and Observation techniques</li> </ul>	
	<ul> <li>Input Design: Introduction to Data Capture, Objectives of DataCapture, Steps for Data Capture</li> </ul>	
	<ul> <li>Output Design: Design Principles of Output, Output objectives, Types of Output, Various forms of Outputs</li> </ul>	
	– Meaning and Significance of Data Flow Diagrams (DFDs)	
	<ul> <li>Symbols used in DFDs</li> </ul>	
	<ul> <li>Rules for Constructing DFDs</li> </ul>	
	<ul> <li>Introduction and comparison between Physical and Logical DFDs</li> </ul>	

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Examination	50%
2.	University Examination	50%

Course Outcomes: Having completed this course, the learner will be able to		
1.	gain knowledge about Systems and System Development Life Cycle (SDLC).	
2	understand the concepts of fact finding techniques, input/output design and Data Flow Diagrams.	





Sugges	Suggested References:	
Sr. No.	References	
1.	S. Parthasarthy & B. W. Khalkar, System Analysis & Design, 1st Edition, Master Ed. Cons., Nashik, 2012.	
2.	James A. Senn, Analysis & Design of Information Systems, 2nd Edition, McGraw-Hill Int., 1989.	
3.	V.Rajaraman, Analysis & Design of Information Systems, Printice Hall of India Private Ltd., 2003.	





Course Code	UB03IKBIT08	Title of the Course	Ayurveda
Total Credits of the Course	2	Total Hours per week	2
Course     1.To explain importance of holistic health care system through Ayurveda.       2.To be a single of the single of the system through Ayurveda.			

Objectives	2. To derive general contribution of Ayurveda in perspectives of health.
	3. To explain the contribution of charak in an area of health care.
	4. To differentiate tridosha, kapha, Pitta and vayu.
	5. To elicit health habits for sound health.

Course	e Content	
Unit	Description	Weightage* (%)
1.	<ul> <li>Ayurveda as a sub system of Athrvaved andRugved</li> <li>Definition and meaning of Ayurveda. charak sahitamain points only</li> <li>The concept of tridosha and its effect on body. The concept of wholistic health care, Psychosometic aspects and health. Brief on Diagnosis and treatment in Ayurveda</li> </ul>	50%
2.	<ul> <li>Life style management through Ayurveda.</li> <li>Water, food, and system of digestion related aspects</li> <li>Satva, Rajas, Tamas, and qualities of a person</li> <li>Health care through Ayurveda</li> <li>Contribution of vaghbhatt and madhav in brief</li> </ul>	50%

Teaching- Learning Methodology	Blended learning approach incorporating both traditional classroom teaching as well as usage of ICT tools.





Evalu	Evaluation Pattern	
Sr.	Details of the Evaluation	Weightage
No.		
1.	Internal Written / Practical Examination	50%
	Internal Continuous Assessment in the form of Practical, Vivavoce,	
	Quizzes, Seminars, Assignments, Attendance	
2.	University Examination	50%

Cou	Course Outcomes: Having completed this course, the learner will be able to	
1.	explain the meaning of Ayurveda.	
2.	exemplify tridosh with elaboration.	
3.	derive the importance of health habits.	
4.	discuss the contribution of Ayurveda for holistic health care.	
5.	elaborate the importance of life style management through ayurvedicpractices	

# Online Resources :

https://archive.org/ https://web.archive.org/web/2/http://ayurved-online.com/





# Add on Certificate Course

Course Code	US03IKBIT09	Title of the Course	Dharmashastra (Aacharasamhita)
Total Credits of the Course	2	Total Hours per week	2

Course Objectives:	<ul> <li>The course will enable the learners to</li> <li>To analyse the etymology and meaning of the word "Dharma" and its significance in various cultures and religions.</li> </ul>
	<ul> <li>To explore the characteristics of Dharma and how it manifests in different contexts.</li> <li>To examine the explanations of the concept of Dharma by renowned.</li> </ul>
	scholars and thinkers throughout history.
	• To recognize the importance of Dharma in shaping human life, ethics, and societal values.
	• To identify the different forms of Dharma present in contemporary society and specifically in the context of Kaliyug (the current age according to Hindu cosmology).
	• To appreciate the significance of Aacharndharma (ethical conduct and righteous behavior) in upholding Dharma.
	• To analyze examples of various characteristics of Dharma in the lives of notable scholars, philosophers, and religious figures.
	• To introduce and gain an overview of the major Dharmashastras (ancient Indian texts that discuss laws, duties, and ethical principles).
	• To foster critical thinking and open discussion regarding the interpretation and application of Dharma in modern times.
	• To develop a deeper understanding of the cultural, ethical, and spiritual dimensions of Dharma and its relevance in contemporary society.

	Course Content		
Unit	Description	Weightage* (%)	
1	<ol> <li>Etymology and meaning of the word Dharma.</li> <li>Characteristics of word Dharma.</li> <li>Explanation of the word Dharma by great scholars.</li> </ol>	50%	
	4. The importance of Dharma in human life.		



2 1. Forms of Dharma at present and kaliyug.
2. Importance of Aacharndharma.
3. Examples of various characteristics of Dharma in the life of scholars.
4. Introduction to the major Dharmashastras.

Teaching-	Lecture-cum-discussion, Group Discussion, Presentations, Seminars,
Learning	tutorials, Research Exercises
Methodology	

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination Internal Continuous Assessment in the form of Practical, Vivavoce, Quizzes, Seminars, Assignments, Attendance	30%
2.	University Examination	70%

Course Outcomes: Having completed this course, the learner will be able to		
1.	Identify the historical and cultural context of the word "Dharma" and explain its etymology and core meaning.	
2.	Analyze the characteristics of Dharma and its manifestations in various aspects of human life, including personal ethics, social responsibilities, and spiritual practices.	
3.	Evaluate the explanations of Dharma provided by eminent scholars and thinkers, and critically examine different perspectives on its interpretation and application.	
4.	Recognize the importance of Dharma in guiding ethical decision-making, promoting harmony in relationships and communities, and fostering a just and compassionate society.	
5.	Apply the concepts of Dharma to contemporary issues and challenges, demonstrating an understanding of the different forms of Dharma in present times, the significance of Aacharndharma, and the influence of Dharma in the lives of scholars and individuals who exemplify its principles.	



Suggested References:

"Dharma: Its Early History in Law, Religion, and Narrative" by Alf Hiltebeitel

"Dharma: The Hindu, Jain, Buddhist and Sikh Traditions of India" by Veena R. Howard.

"The Concept of Dharma in Valmiki Ramayana" by Dr. Nityanand Mishra

"Dharma in Hinduism: A Historical and Philosophical Perspective" by Arvind Sharma

"Dharma and Ecology of Hindu Communities: Sustenance and Sustainability" edited by Pankaj Jain

"Understanding Dharma: The Four Authentic Sources" by Pradip Gangopadhyay

Online Resources :

Oxford Research Encyclopedia of Religion: "Dharma" https://oxfordre.com/religion/view/10.1093/acrefore/9780199340378.001.0001/acrefore-9780199340378-e-63 Hinduism Today: "The Four Dharmas of the Kali Yuga" -

https://www.hinduismtoday.com/modules/smartsection/item.php?itemid=5594