

Vallabh Vidyanagar, Gujarat (Reaccredited with 'A' Grade by NAAC (CGPA 3.11)) Syllabus of Sem-V with effect from the Academic Year 2025-2026

B.Sc (Information Technology) (Semester-V)			
Course Code	US05MABIT01	Title of the	Fundamentals of Visual Programming
		Course	
Total Credits	4	Hours per	4
Of the Course		Week	
Course	1. To understand.	NET Frameworl	and describe some of the major enhancements
Objectives:	Objectives: to the new version of Visual Basic.		
	2. To describe the basic structure of a Visual Basic .NET project and use main		
features of the Integrated Development Environment (IDE).			
	3. To understand how to create applications using Microsoft Windows Forms.		
	4. To understand Exception handling.		
	5. To understand and create applications that use ADO.NET.		

Course	e Content	
Unit	Description	Weightage
		(70)
1.	Introduction to .NET Framework (4.5) and VB.NET	
	• .NET Architecture,	
	 .NET Languages, Microsoft Intermediate Language (MSIL), The Just In Time (UT) compiler 	
	 The Just-In-Time (JTT) compiler, Working with Assemblies 	
	 Working with Assemblies, The NET framework class library VP NET introduction applications 	
	• The INET framework class horary VBINET, infoduction, applications and types of project Introduction to Visual Studio IDE	25
	 Creating simple Windows Application using VB.NET Variables, data types. 	
	constants and operators	
	• Type casting, Boxing and Unboxing,	
	• Working with arrays and strings Creating simple Windows Application	
	using VB.NET	
2.	Fundamentals of VB.NET	
	• VB.NET Basics, Use of conditional statement (if), Multi branching	
	statement (select) and WithEnd With statement,	
	• Looping Statement: DO, FOR, FOR EACHNEXT and WHILE, Working	
	Working with most during introduction types and of non-motors	
	• working withprocedures – introduction, types, use of parameters,	
	• OOP concepts - Encapsulation Inheritance	
	 Interfaces and Polymorphism Working with modules classes (partial) and 	
	namespaces	25
	• Working with Windows Forms – introduction, life cycle, basic properties.	
	methods and events, use of simple windows forms control.	
	• Working with SDI and MDI forms	





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3.	 Developing Windows Forms, Exception Handling Working with basic controls – Button, CheckBox, CheckedListBox, ComboBox, DateTimePicker, GroupBox, HScrollBar, RadioButton, VscrollBar, Label, ListBox, PictureBox, TextBox and Time controls. Working with advanced controls – LinkLabel, RichTextBox, ColorDiolog, FontDialog, TreeView, Error Provider Control Working with modules, classes (partial) and namespaces Error Handling: exception, structured exception using trycatch and final statement 	25
4.	 Database with ADO.NET Persisting Data Using Databases and Files ADO.NET –introduction and applications ADO.NET – architecture (connected anddisconnected) Database connectivity using ADO.NET Use of Data sources, Server Explorer and working with DataSet, Populating data in a DataGridView Working with report 	25

Teaching- Learning Methodology	Blended learning approach in corporating both traditional classroom teaching as well as usage of ICT tools.
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Evalu	ation Pattern	
Sr.	Details of the Evaluation	Weightage
No.		
1.	Internal Written Examination (As per CBCS R.6.8.3) Internal Continuous Assessment in the form of Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	50%
2.	University Examination	50%

Course Outcomes: Having completed this course, the learner will be able to understand

1.	the .NET Framework and describe some of the major enhancements to the new version of Visual
	Dasie.
2.	the basic structure of a VisualBasic .NET project and use main features of the integrated development environment (IDE).
3.	how to create applications using Microsoft Windows Forms.
4.	the basic concepts related to Exception handling.
5.	how to develop applications that use ADO.NET.





Suggested References:		
Sr.No.	References	
1.	Steven Holzner; VB.NET Black Book by Dreamtech publication, 2005.	
2.	Francesco Balena : Programming Microsoft Visual Basic.NET, Microsoft Press, 2003.	
3	Bill Evjen, BillyHollis, Bill Sheldon, KentSharkey and Tim McCarthy: Professional VB 2005 with .NET 3.0, 2007.	

On-line resources to be used if available as reference material

On-line Resources

1. https://www.tutorialspoint.com/

2. https://www.w3schools.com/

3. https://www.javatpoint.com/





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B.Sc. (Information Technology) (Semester-V)

Course Code	US05MABIT02	Title of the	Operating Systems
		Course	
Total Credits	4	Hours per	4
Of the Course		Week	
Course Objectives:	1. To provide basic understanding of the role and functioning of an operating system.		
	2. To introduce the basic concepts related to processor management, memory management, process synchronization and deadlocks.		
	3. To impart fundamental knowledge on Linux shell environment and		
	programming.		

Course Content		
Unit	Description	Weightage (%)
1.	 Introduction and Scheduling Introduction to Operating System, Operating System Services Different types of Operating Systems: Real time, Time sharing, Distributed and Multiprogramming. OS Structure – Simple Structure, Layered Approach, Microkernel. CPU Scheduling: Introduction to process, process control block, process scheduling, FCFS Scheduling, SJF scheduling, Priority scheduling, Round Robin scheduling 	25
2.	 Memory Management Memory Management: Concept, Basic memory management techniques Swapping, Paging, The concept of a Page Fault Page Replacement Algorithms: FIFO, LRU, OPT The concept of virtual memory Demand Paging 	25
3	 Process Synchronization, Deadlocks and Introduction to Linux Introduction to Cooperating processes Process Synchronization Introduction to Critical Section Problem Two process solution The concept of a Deadlock and characterization Introduction to Linux Operating System Features of Linux 	25





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4.	Basic Linux commands	
	• Basic Commands: login, logout, date, man, pwd, who, dir, ls, cd,	
	• mkdir, rmdir,wc,echo	
	• Use of Wild card characters	
	• Types of FAP(File Access Permission), use of chmod command	25
	• Basic commands like cp, mv, rm, rev, file redirection, grep, cut, paste, find, sort commands with example	
	• Introduction to shell script: execution of it, shell script variable, expr, test commands – Control structures: if, ifelse, case structure – Iteration: while, for construct, break, continue, exit commands	

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

Sr.No.	Details of the Evaluation	Weightage
1.	Internal Written Examination (As per CBCS R.6.8.3)	50%
	Internal Continuous Assessment in the form of Quizzes, Seminars,	
	Assignments, Attendance (As per CBCS R.6.8.3)	
2.	University Examination	50%

Course Outcomes: Having completed this course, the learner will be able to understand			
1.	the role and functioning of an operating system.		
2.	fundamentals concepts related to memory management, process synchronization and deadlocks.		
3.	Linux command-line environment.		

References

- 1. Andrew S. Tanenbaum: Operating System deign & Implementation, Prentice Hall International, 2006.
- 2. James Peterson and Abraham Silberschatz: Operating System Concept, Addition Wesley, 2019.
- 3. Bryan Pfaffenberger Linux Commands Instant reference, BPB Publication, 2000
- 4. Sumitabha Das UNIX, Concepts and Applications Tata McGraw-Hill Publications, 2006.
- 5. Advanced Linux Programming Samuel, Techmedia Publications, 2001.

On-line resources to be used if available as reference material

- 1. https://www.tutorialspoint.com
- 2. https://www.w3schools.com
- 3. https://www.javatpoint.com





Course Code	US05MABIT03	Title of the Course	Practical based on US05MABIT01 and US05MABIT02
Total Credits Of the Course	4	Hours per Week	8
Course Objectives:	 To understand implementing problems using Visual Basic.NET To understand implementing database programming using ADO.NET To impart fundamental knowledge on Linux shell environment and 		
	programming.		

Course Content		
Unit	Description	Weightage (%)
1.	Part-1 : Practical Based on Programming Fundamental Using Visual Basic .NET	70
2.	Part-2 : Practical based on Linux shell scripting.	30

Practical-based learning in small groups and Hands on training through required ICT tools.

Evaluation Pattern		
Sr.	Details of the Evaluation	Weightage
No.		
1.	Internal Practical Examination (As per CBCS R.6.8.3)	50%
	Internal Continuous Assessment in the form of Practical, Viva-voce,	
	Attendance (As per CBCS R.6.8.3)	
2.	University Examination	50%

Cou	Course Outcomes: Having completed this course, the learner will be able to understand		
1.	the basic structure of a VisualBasic .NET project and use main features of the integrated development environment (IDE)		
	development environment (IDE).		
2.	how to create applications using Microsoft Windows Forms, Exception Handling and ADO.Net		
3.	gain knowledge in implementing Linux shell scripting programming.		





Course Code	US05MIBIT04	Title of the	Open Source Technology using PHP
		Course	
Total Credits	2	Hours per	2
Of the Course		Week	
Course Objectives:	1. To introduce fundamental concepts related to PHP programming.		
	2. To impart basic knowledge of working with advanced features of PHP and interaction with forms.		
	3. To provide basic	understanding of data	base access.

Course Content		
Unit	Description	Weightage (%)
1.	 Introduction to PHP Overview of Scripting Language,PHP Features, Merits and Demerits General requirements for PHP programming [Text Editor, Various IDEs, WAMP, XAMPP server] PHP Program Structure and Syntax Variables, constant and Datatypes PHP Output Statements and Operators Escaping from HTML (ways to differentiate PHP code from other code) Control structures in PHP Array and its types, Array functions and its manipulation User Defined Functions and Super global Variables Interaction with HTML Forms Validating HTML forms (Empty String, Input Length, e-mail) 	50
2.	 Working with MySQL Introduction to MySQL: Features, Advantages, Disadvantages MySQL Data types Basic Steps for PHP with MySQL Database Connectivity Connecting to MySQL, Selecting Database, Executing MySQL Queries, Fetching Data, Getting Data about Data Error Checking Executing System Calls Introduction to OOPS in PHP Introduction to File Handling in PHP 	50
Taa	Introduction to File Handling in PHP	

Teaching- Learning Methodology	Blended learning approach incorporating both traditional class-room teaching as well as usage of ICT tools.
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Evaluation Pattern		
Sr.No.	Details of the Evaluation	Weightage
1.	Internal Written Examination (As per CBCS R.6.8.3) Internal Continuous Assessment in the form of Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	50%
2.	University Examination	50%

Course Outcomes: Having completed this course, the learner will be able to understand		
1.	fundamental concepts related to PHP programming.	
2.	basic knowledge of working with advanced features of PHP and interaction with forms.	
3.	database access in PHP.	

Suggested References:		
Sr. No.	References	
1	PHP – A Beginner's guide, Vikram Vaswani, TMH, 2009.	
2	PHP6 and MySQL Bible by Joyce Park, Steve Suehring, and Tim Converse, 2009.	
3	Web enabled commercial application development using HTML, Javascript, DHTML and PHP by Ivan Bayross, BPB Publication, 2010.	
4	Beginning PHP5 By Dave Mercer, Allan Kent, Steven Nowicki, David Mercer, DanSquier, Wankyu Choi, Wrox Publication, 2004	





Course Code	US05MIBIT05	Title of the Course	Practical based on US05MIBIT04
Total Credits Of the Course	2	Hours per Week	4
	1		

Course Objectives:	To learn the concepts of web programming using PHP.

Course	Course Content		
	Description	Weightage (%)	
	Practical based on PHP scripting and MySQL Database Connectivity.	100	

Teaching- Learning Methodology		Practical based learning in small groups and Hands on training through required ICT tools.	
Evaluation	Pattern		
Sr. No.	Details of the Evaluation Weightag		Weightage
1.	Internal Practical Examination (As per CBCS R.6.8.3)50Internal Continuous Assessment in the form of Practical, Viva-voce, Attendance (As per CBCS R.6.8.3)50		50%
2.	University Examination		50%

Cou	Course Outcomes: Having completed this course, the learner will be able to		
1.	gain the knowledge of PHP Programming.		
2	working with advanced features of PHP and interaction with forms.		
3	database access in PHP.		





Course Code	US05MIBIT06	Title of the	Advanced Java Programming
		Course	
Total Credits	2	Hours per	2
Of the Course		Week	
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Course Objectives:	1. To study the fundamental concepts related to JDBC.		
5	2. To acquire knowledge about basic concepts of Servlets and Java Server page.		

Course	Course Content			
Unit	Description	Weightage (%)		
1.	 JDBC & Collection Frame work Basic JDBC program Concept Architecture of JDBC Making the Connection, Statement & its types Executing queries Wrapper Class (Integer, Float and Double) and Methods 	50		
2.	 Introduction Servlet and Java Server Pages (JSP) Introduction to Servlet, Types and Life cycle of servlet Execution process of Servlet Application Introduction to JSP, Components of JSP and Lifecycle of JSP Directives, Tags, Scripting Elements Execution process of JSP Application Building a simple application using JSP 	50		

Blended learning approach incorporating both traditional classroom teaching as well as usage of ICT tools.
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Evaluation Pattern		
Sr.	Details of the Evaluation	Weightage
No.		
1.	Internal Written Examination (As per CBCS R.6.8.3) Internal Continuous Assessment in the form of Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	50%
2.	University Examination	50%





Course Outcomes: Having completed this course, the learner will be able to understand		
1.	fundamental concepts related to JDBC.	
2.	basic concepts of Servlets and JSP.	

Suggested l	Suggested References:		
Sr. No.	References		
1.	The Complete Reference – JAVA Herbert Schildt, 2017.		
2.	Core Java –II By Cay S. Horstmann and Gary Cornell, 2020.		
3.	Compete Reference J2EE – Jim Keogh, 2017.		
4.	Programming with Java- A Primer by E. Balagurusamy, 3rd Edition, TMH, 2007.		

On-line resources to be used if available as reference material

- 1. https://www.tutorialspoint.com/
- 2. https://www.w3schools.com/

3. https://www.javatpoint.com/





SARDAR PATEL UNIVERSITY Vallabh Vidyanagar, Gujarat (Reaccredited with 'A' Grade by NAAC (CGPA 3.11)) With effect from the Academic Year 2025-2026

B.Sc (Information Technology) (Semester-V)

Course Code	US05MIBIT07	Title of the Course	Practical based on US05MIBIT06
Total Credits Of the Course	2	Hours per Week	4
Course Objectives:1. To study the fundamental concepts related to JDBC.2. To acquire knowledge about basic concepts of Servlets and Java Server page.			

bjectives		2	. Te	o acc	quire	kn (owl	edge	e abo	out	basic	con	cepts	of	Ser	vlets	and	Java	a Ser	ver p	bage.	
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Course	Course Content				
	Description	Weightage (%)			
	Practical-based on Fundamental Using Java.	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.	Details of the Evaluation	Weightage
No.		
1.	Internal Practical Examination (As per CBCS R.6.8.3)	50%
	Internal Continuous Assessment in the form of Practical, Viva-voce,	
	Attendance (As per CBCS R.6.8.3)	
2.	University Examination	50%
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Cou	rse Outcomes: Having completed this course, the learner will be able to implement
1.	fundamental concepts related to JDBC.
2	basic concepts of Servlets and JSP.





Course Code	US05SEBIT08	Title of the	Software Engineering Fundamentals			
		Course				
Total Credits	2	Hours per	2			
Of the Course		Week				
r	1					
Course	1. To understand	the principles ar	nd techniques for designing and developing			
Objectives:	high-quality software systems.					
	2. To learn the software development life cycle.					
	3. To study the basic concepts of software design.					

Course	Course Content				
Unit	Description	Weightage (%)			
1.	 Introduction and Requirement Specification Software and Software Engineering Characteristics of Software process Phases of Software Development Process Models: Waterfall, Prototype, Iterative Enhancement, Spiral Model Introduction to Agile Methodology Introduction: SRS and Needs Problem Analysis: 	50			
2.	 Characteristics & Components of SRS Structure and Validation of SRS Software Design Introduction: System Design, Design Objectives, Design (Principles/Concepts) Top Down & Bottom Up approach Problem Partitioning Abstraction Modularity Module Level concept, Coupling, Cohesion 	50			
	 Overview of Structured design Functional v/s Object-oriented approach Design Specification, Verification Introduction : Detailed Design and Module Specification 				

Teaching- Learning Methodology	Blended learning approach incorporating both traditional classroom teaching as well as usage of ICT tools.
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Evaluatio	Evaluation Pattern						
Sr. No.	Details of the Evaluation	Weightage					
1.	Internal Written Examination (As per CBCS R.6.8.3) Internal Continuous Assessment in the form of Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	50%					
2.	University Examination	50%					

Course O	Course Outcomes: Having completed this course, the learner will be able to develop					
1.	fundamental concepts related to software engineering, different phases of software development and various process models.					
2.	basic concepts related to requirement specification and software project planning.					
3	concepts related to system design.					

Suggestee	buggested References:							
Sr. No.	References							
1.	Engineering Software as a Service An Agile Software Approach, Armando Fox and David Patterson, 2014.							
2.	An Integrated Approach to Software Engineering by Pankaj Jalote, Narosa Publishing House, Second Edition, 1997.							
3.	Software Engineering a practitioner's approach by Roger S. Pressman, Tata McGraw- Hill, Fifth Edition, 2001.							
4.	Software Engineering Fundamentals by Richard Fairley, Tata McGraw-Hill, 2017.							
5.	Software Engineering, By Ian Summerville, Addition-Wesley, Fifth Edition, 2000.							

On-line Resources							
1. https://www.geeksforgeeks.org/software-engineering/							
2. https://www.javatpoint.com/software-engineering							

