

C P PATEL AND F H SHAH COMMERCE (AUTONOMOUS) COLLEGE, ANAND

(Managed by SARDAR PATEL EDUCATION TRUST, ANAND)

AFFILIATED TO SARDAR PATEL UNIVERSITY, V V NAGAR

An ISO 9001 2015 Certified / An ISO 14001-2015 Certified / An ISO 21001-2018 Certified

GUJARAT INSTITUTIONAL RATING FRAMEWORK (4 STAR)

AAA Reaccredited CGPA 3.56 – GRADE **A⁺** KCG-Dept of Edu. Govt of Gujarat-April 2017

NAAC Reaccredited - CGPA 3.30 - GRADE **'A⁺'** UGC – MHRD, Govt of India – June 2022

Syllabus as per NEP 2020 with effect from the Academic Year 2025-2026

Bachelor of Computer Applications (BCA)

PROGRAMME OUTCOME

At the end of the BCA programme the students will be able to:

- Understand the fundamental concepts of computers, software hardware and peripheral devices and evolution of computer technologies.
- Work in the IT sector as system engineer, software tester, junior programmer, web developer, system administrator, software developer etc.
- Apply standard software engineering practices and strategies in software project development using open source programming environment to deliver a quality of product for business success.

PROGRAM SPECIFIC OUTCOMES

- Equip themselves to potentially rich & employable field of computer applications.
- Pursue higher studies in the area of Computer Science/Applications.
- Take up self-employment in Indian & global software market.
- Meet the requirements of the Industrial standards.

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Course Structure under NEP – 2020(BCA) Semester-VI

Subject		Subject Code	Subject Title	Theory/ Practical	Credits	WCH	Exam Duration	Marking Scheme		
								Int	Ext	Total
Discipline Specific Course Core (Major)	Core Course-1	US6MABCA01	.NET Technology With C#	T	4	4	2	50/18	50/18	100/36
	Core Course-2	US6MABCA02	Mobile Application Development	T	4	4	2	50/18	50/18	100/36
	Practical of Core Course-1 and Core Course-2	US6MABCA03	Practical Based on .NET technology and Mobile Application Development	P	4	4	2	50/18	50/18	100/36
Minor	Minor Course-1	US6MIBCA04	Software Engineering	T	4	4	2	50/18	50/18	100/36
Ability Enhancement Course	Ability Enhancement Course-1	US6AEBCA05	Artificial Intelligence	T	2	2	1	25/09	25/09	50/18
Skill Enhancement Course	Skill Enhancement Course-1	US6SEBCA06	Internship	T	4	8	2	50/18	50/18	100/36
Minimum Qualifying Credits					22					

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BCA (Bachelor of Computer Applications) (Semester–VI)

Course Code	US6MABCA01	Title of the Course	.NET Technology With C#
Total Credits of the Course	4	Hours per Week	4
Course Objectives	1. Intended to teach Web Development in advanced programming language		
	2. To understand the need, model, application of a web development		

Course Content		
Unit	Description	Weightage (%)
1.	Introduction <ul style="list-style-type: none"> ASP.NET Introduction Overview of ASP.NET Framework (CLR, JIT, META DATA , MSIL) Advantages of ASP.NET Difference between Web application, Web site, Desktop application Introduction and Role of Web Servers Internet Information Server (IIS) ASP.NET Web Applications 	25 %
2.	ASP.NET Standard Controls and Validation Controls <ul style="list-style-type: none"> Using Standard Controls (Label, TextBox, CheckBox, ListBox, Button, RadioButton, Linkbutton, ImageButton, DropDownList, Adrotate, View and Multiview) Validations in asp.net Client-side validation vs. Server-side validation Overview of the Validation Controls (Required Field Validator, Range Validator, Regularexpression Validator, Compare Validator, Validation Summary, Custom validator) Master Page.(Example and usage) Site Navigation Controls (Menu, TreeView, ListView) 	25 %
3.	State Management and Advanced Concepts <ul style="list-style-type: none"> Introduction to State Management Introduction State Management using ViewState , Cookies, Session, Application QueryString (With practical examples) 	25 %

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4.	Database Programming <ul style="list-style-type: none">• ADO.NET Architecture• Connected and Disconnected Connection, Command DataReader, DataSet DataAdapter• Data Binding Introduction to Data controls GridView, DetailsView ListView, FormView	25 %
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Teaching-Learning Methodology	Classroom Interaction and in addition demonstration through case studies and ICT based applications.
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written	50%
2.	Internal Continuous Assessment in the form of Quizzes, Seminars, Assignments, Attendance	
3.	External Examination	50%

Course Outcomes		
1.	Understand the fundamentals advanced programming	
2.	Proper implement of any web application through server side web programming	
3.	In-depth knowledge about basic functionalities, models etc...	
Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination	50%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance	
3.	External Examination	50%

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Suggested References	
Sr. No.	References
1.	Matthew MacDonald : Beginning ASP.NET 2.0 in VB 2005 by Apress, First Indian Reprint 2006
2.	Stephen Walther : ASP.NET 2.0 Unleashed by Sams Publication, 2006
3.	Scott Mitchell : Teach Yourself ASP.NET 2.0 in 24 Hours by Sams Publication, 27 June 2008
4.	A Step-by-Step Guide to Build Web Applications Using ASP.NET 5 and C#” by Jonas Fagerberg, July 2016.

On-line Resources	
1.	https://dotnet.microsoft.com/en-us/apps/aspnet
2.	https://learn.microsoft.com/en-us/dotnet/visual-basic/
3.	https://www.javatpoint.com/asp-net-tutorial

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BCA (Bachelor of Computer Applications) (Semester–VI)

Course Code	US6MABCA02	Title of the Course	Mobile Application Development
Total Credits of the Course	4	Hours per Week	4
Course Objectives	1. To introduce students to fundamental concepts related to Android programming.		
	2. To impart basic knowledge of working with features of Android Mobile Application Development		
	3. To provide basic understanding of database access.		
Course Content			
Unit	Description		Weightage (%)
I	<u>Introduction to Android</u> <ul style="list-style-type: none">• Introduction, Android Versions with device and its Features• Advantages and disadvantages of Android OS• Architecture of Android• Standard development environment for Android applications Installing Android, Android Development Tools(ADT), Creating Android Virtual Devices(AVDs)• Creating Hello World and running application on Emulator		25%
II	<u>Layouts, Activities, Fragments and Intents</u> <ul style="list-style-type: none">• Linear layout, Relative layout, table layout, frame layout• Understanding Activities – Life Cycle of an Android Activity Applying Styles and Themes to an Activity• Linking Activities Using Intents• Understanding the intent Objects• Use of Intent Filters• Toast		25%

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	<ul style="list-style-type: none">• Fragments, Fragment Life Cycle• Adding Fragments Dynamically• Intersections between fragments Intents	
III	<u>Controls Using Basic Views</u> <ul style="list-style-type: none">• TextView, Button, ImageButton, EditText, CheckBox, ToggleButton, RadioButton, RadioGroup , ProgressBar, AutoCompleteTextView• Using Picker Views TimePicker, DatePicker• Dialogbox• Using List Views ListView, Spinner• Custom ListView• SharedPreferences (Session)	25%
IV	<u>Advanced Controls & Database Access</u> <ul style="list-style-type: none">• Gallery and ImageView ImageSwitcher, GridView• Menus Using Options Menu, Context Menu• AnalogClock and DigitalClock. WebView• Introduction to the SQLite database• Creating and managing the SQLite database	25%

Teaching-Learning Methodology	Blended learning approach incorporating both traditional classroom teaching as well as usage of ICT tools.
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Course Outcomes	
1.	Understanding of the fundamental concepts related to Mobile App Development with Android.
2.	Basic knowledge of working with advanced features Mobile App Development. With Android
3.	Understanding of database access in Mobile App Development in Android

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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination	50%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance	
3.	External Examination	50%

Suggested References	
Sr.No.	References
1.	Wei-Meng Lee, “Beginning Android Application Development”, Wiley Publishing, Inc, Wrox Programmer to Programmer, 2013.
2.	Lauren Darcey, Shane Conder, “Android Wireless Application Development”, 2 nd Edition, 2010.
3.	Ian F. Darwin, “Android Cookbook”, O’Reilly, 2012.

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/

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BCA (Bachelor of Computer Applications) (Semester–VI)

Course Code	US6MABCA03	Title of the Course	Practical Based on .NET technology and Mobile Application Development
Total Credits of the Course	04	Hours per Week	08

Course Objectives	1. To provide practical knowledge on usage of the .NET Technology.
	2. To provide practical knowledge of Mobile Application Development.

Course Content		
Unit	Description	Weightage (%)
1.	PART-A : Practical based on US06MABCA01	50%
2.	PART-B : Practical based on US06MABCA02	50%

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 Practical	50%
2.	External Examination	50%
Course Outcomes		
1.	Gain practical knowledge on .NET Technology.	
2.	Gain practical knowledge on Mobile Application Development.	

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BCA (Bachelor of Computer Applications) (Semester–VI)

Course Code	US6MIBCA04	Title of the Course	Software Engineering
Total Credits of the Course	4	Hours per Week	4

Course Objectives	1. Learning software engineering aims to equip individuals with the skills to design, develop, test,
	2. Maintain reliable, efficient, and maintainable software solutions
	3. Encompassing knowledge of methodologies, tools, and ethical considerations.

Course Content		
Unit	Description	Weightage (%)
1.	Introduction Software and Software Engineering <ul style="list-style-type: none">• Introduction• Characteristics of Software process• Phases of Software Development• Process Models:• Waterfall• Prototype• Iterative Enhancement• Spiral Model• Introduction to Agile Computing	25%
2.	Requirement Specification and Software Project Planning <ul style="list-style-type: none">• Introduction: SRS and Needs Problem Analysis: (Structuring Information ONLY)• Requirement Specifications: Characteristics & Components of SRS Specification Languages (Structured English, Regular Expressions & Decision Tables)(Definition ONLY)	25 %

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	<ul style="list-style-type: none">• Structure of SRS Validation of SRS• SQAP• Introduction to software projects, Planning, Categories of Software projects Overview of Cost estimation, COCOMO Model• Project Monitoring Plan (Time sheets, Reviews, Cost-Schedule-Milestone, Earned Value Method)	
3.	Software Design Introduction <ul style="list-style-type: none">• System Design, Design Objectives• Design Principles/Concepts: Top down & Bottom Up approach• Problem Partitioning, Coupling, Cohesion• Object Modeling using UML – Overview, Diagrams – class, sequence• Design Specification, Verification Introduction: Detailed Design, Module Specification and its Desirable Properties, Functional module Specification, Data Abstraction Specification Verification- Design Walkthrough, Critical Design, review, Consistency checkers	25%
4.	Coding and Testing <ul style="list-style-type: none">• Introduction Coding• Top Down & Bottom Up Approach for coding• Structured Programming• Information Hiding• Programming Style• Internal Documentation Verification• Introduction: Testing, Error, Fault, Failure & Reliability• Top down and bottom up approach for testing• Levels of Testing• Functional Testing v/s Structural Testing (Difference ONLY)	25%
Teaching-Learning Methodology	Material for this course will be presented using multiple teaching approaches: lecture and discussion, exploration and inquiry ,cooperative group work, demonstrations, and presentations	

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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written	50%
2.	Internal Continuous Assessment in the form of Quizzes, Seminars, Assignments, Attendance	
3.	External Examination	50%
Course Outcomes		
1.	How to apply the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction, and deployment	
2.	An ability to work in one or more significant application domains	
3.	Work as an individual and as part of a multidisciplinary team to develop and deliver quality software	
4.	Demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for the software lifecycle	
Suggested References		
Sr. No.	References	
1	An Integrated Approach to Software Engineering by PankajJalote ,Narosa Publishing House, Second Edition,1997.	
2	Software Engineering a practitioner’s approach by Roger S. Pressman, Tata McGraw-Hill, Fifth Edition, 2001.	
3	Software Engineering Fundamentals ,By Richard Fairley, Tata McGraw- Hill,1997.	
4	Software Engineering, By Ian Sommerville, Addition-Wesley, Fifth Edition, 2000.	
Online References		
1.	https://www.tpointtech.com/software-engineering	
2.	https://www.computer.org/education/bodies-of-knowledge/software-engineering	

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BCA (Bachelor of Computer Applications) (Semester–VI)

Course Code	US6AEBCA05	Title of the Course	ARTIFICIAL INTELLIGENCE
Total Credits of the Course	02	Hours per Week	02

Course Objectives	1. To learn the fundamental concepts of traditional AI systems.
	2. To get awareness regarding various application areas in the field of AI.
	3. To learn various AI techniques such as expert systems, fuzzy logic, and their applications.

Course Content		
Unit	Description	Weightage (%)
1.	Artificial Intelligence (AI) and Knowledge Based Systems (KBS) <ul style="list-style-type: none">Natural and Artificial IntelligenceTesting intelligence with Turing test, and Chinese room experiment.Application areas of Artificial Intelligence, Data pyramidProduction systems and AI based searches like Hill climbing andHeuristic searchKBS structure, Components of KBS, Categories of KBS, KnowledgeBased Shell, Advantages, Limitations and Applications of KBSKnowledge acquisition, Knowledge updateFactual and procedural knowledge representationsKnowledge management cycleApplication areas of AI	50%
2.	Fuzzy Logic <ul style="list-style-type: none">Fuzzy logic, Fuzzy sets, Membership functionsFuzzification and DefuzzificationOperations on fuzzy sets	

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	<ul style="list-style-type: none">Fuzzy functions and Linguistic variablesFuzzy relations, Propositions and ConnectivesFuzzy rules and Fuzzy rule based systemsFuzzy control system.	50%
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Teaching-Learning Methodology	Blended learning approach incorporating traditional classroom teaching and Online /ICT-based teaching practices.
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written	50%
2.	Internal Continuous Assessment in the form of Quizzes, Seminars, Assignments, Attendance	
3.	External Examination	50%
Course Outcomes		
1.	Understanding of fundamental concepts related to artificial intelligence.	
2.	Understanding of the applications of artificial intelligence in various domains.	
Suggested References		
Sr. No.	References	
1.	Rushell and Norvig, Modern Approach to Artificial Intelligence, Prentice Hall of India Ltd., 2009.	
2.	Elaine Rich, Artificial Intelligence, Tata McGraw Hill Publishing Co. Ltd., 3rd Edition (Sie), 2019.	
3.	VijyalaxmiPais and Rajasekaran, Neural Networks, Fuzzy Systems and Evolutionary Algorithms: Synthesis and Applications, Prentice Hall of India, Pvt Ltd., 2017.	

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BCA (Bachelor of Computer Applications) (Semester–VI)

Course Code	US6SEBCA06	Title of the Course	Internship
Total Credits of the Course	04	Total Hours	08

Course Content

To undergo project-based learning on software development applications for solving various real life problems. (In House Project Development)

Evaluation Pattern

Sr. No.	Details of the Evaluation	Weightage
1.	Internal Project Examination Internal Continuous Assessment in the form of Practical, Viva-voce, Attendance	50 %
2.	External Examination	50 %
