

SAURASHTRA UNIVERSITY

RAJKOT – INDIA



Grade 'A' by NAAC

CURRICULAM

FOR

B.C.A.

Bachelor of Computer Application

(Semester V and Semester VI)

Effective from June – 2018

Bachelor of Computer Application
(Semester – V and Semester - VI)
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Effective from June - 2018

B.C.A. (Semester – V)			
SR.NO	SUBJECT	NO. OF THEORY LECT. PER WEEK	NO. OF PRACTICAL PER WEEK
1	CS – 25 Advance Java Programming (J2EE)	5	6
2	CS – 26 Programming with ASP.NET	5	6
3	CS – 27 Web Searching Technology and Search Engine Optimization	5	3
4	CS – 28 Practical - 1 (based on CS-25)	-	6
5	CS – 29 Practical – 2 (based On CS-26 and CS-27)	-	6
6	CS – 30 Project Viva	-	6

Note:

1. Credit of each subject is 5. Total credit of semester is 36.
2. Total marks of each theory paper are 100 (university examination 70 marks + internal examination 30 marks).
3. Total marks of each practical and project-viva paper are 100. No internal examination marks in practical and project-viva papers.

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CS-25 Advanced Java Programming (J2EE)				
Sr. No	Topics	Details	Weightage in %	Approx Lectures
1	The J2EE Platform, JDBC (Java Database Connectivity)	<ul style="list-style-type: none"> • Introduction to J2EE • Enterprise Architecture Styles: <ul style="list-style-type: none"> ▪ Two-Tier Architecture ▪ Three-Tier Architecture ▪ N-Tier Architecture • Enterprise Architecture • The J2EE Platform • Introduction to J2EE APIs (Servlet, JSP, EJB, JMS, JavaMail, JSF, JNDI) • Introduction to Containers • Tomcat as a Web Container • Introduction of JDBC • JDBC Architecture • Data types in JDBC • Processing Queries • Database Exception Handling • Discuss types of drivers • JDBC Introduction and Need for JDBC • JDBC Architecture • Types of JDBC Drivers • JDBC API for Database Connectivity (java.sql package) • Statement, PreparedStatement • CallableStatement • ResultSetMetaData • DatabaseMetaData • Other JDBC APIs • Connecting with Databases (MySQL, Access, Oracle) 	20	12

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2	RMI Servlet	<ul style="list-style-type: none"> • RMI overview • RMI architecture • Stub and Skeleton • Developing and Executing RMI application • Servlet Introduction • Architecture of a Servlet • Servlet API (Javax.servlet and javax.servlet.http) • Servlet Life Cycle • Developing and Deploying Servlets • Handling Servlet Requests and Responses • Reading Initialization Parameters • Session Tracking Approaches (URL Rewriting, Hidden Form Fields, Cookies, Session API) • Servlet Collaboration • Servlet with JDBC 	20	12
3	JSP, Java Beans	<ul style="list-style-type: none"> • Introduction to JSP and JSP Basics • JSP vs. Servlet • JSP Architecture • Life cycle of JSP • JSP Elements: Directive Elements, Scripting Elements, Action Elements <ul style="list-style-type: none"> ▪ Directives Elements (page, include, taglib) ▪ Scripting Elements (Declaration, scriptlet, expression) ▪ Action Elements (JSP:param, JSP:include, JSP:Forward, JSP:plugin) • JSP Implicit Objects • JSP Scope • Including and Forwarding from JSP Pages • include Action • forward Action • Working with Session & Cookie in JSP • Error Handling and Exception Handling with JSP • JDBC with JSP • JavaBean Properties • JavaBean Methods • Common JavaBean packaging 	20	12

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4	MVC Architecture, EJB, Hibernate	<ul style="list-style-type: none"> • Introduction to MVC • Implementation of MVC Architecture • Introduction • Benefits of EJB • Restriction on EJB • Types of EJB • Session Beans • Entity Beans • Message-driven beans • Timer service • Introduction to Hibernate • Need for hibernate • Features of hibernate • Disadvantages of Hibernate • Exploring Hibernate Architecture • Downloading and Configuring and necessary files to Hibernate in Eclipse • Jars files of hibernate. • Hibernate Configuration file • Hibernate Mapping file • Basic Example of Hibernate • Annotation • Hibernate Inheritance • Inheritance Annotations • Hibernate Sessions 	20	12
5	Spring, Struts	<ul style="list-style-type: none"> • Introduction of Spring Framework • Spring Architecture • Spring Framework definition • Spring & MVC • Spring Context definition • Inversion of Control (IoC) in Spring • Aspect Oriented programming in Spring (AOP) • Understanding Struts Framework • Comparison with MVC using RequestDispatcher and the EL • Struts Flow of Control • Processing Requests with Action Objects • Handling Request Parameters with FormBeans • Prepopulating and Redisplaying Input Forms • Using Properties Files 	20	12
		Total	100	60

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Reference Books:

- (1) The Complete Reference Java 2 - Herbert Schildt and Patrick Naughton
- (2) Java Server Programming For Professionals, Ivan Bayross, Sharanam Shah – Shroff publication
- (3) Advanced Java Programming [ISBN: 978 - 93 - 81786 - 91 – 8] by Bharat & Company
- (4) Developing Java Servlets – Techmedia
- (5) JSP Beginner's Guide – Tata McGraw Hill by Gary Bolling, Bharathi Nataragan
- (6) Spring and Hibernate, K. Santosh Kumar, - Tata McGraw-Hill
- (7) Hibernate Made Easy: Simplified Data Persistence with Hibernate and JPA (Java Persistence API) Annotations by Cameron Wallace McKenzie, Kerri Sheehan
- (8) Spring Framework: A Step by Step Approach for Learning Spring Framework - CreateSpace Independent Publishing Platform
- (9) Beginning Hibernate Second Edition By Jeff Linwood, Dave Minte - APress

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CS-26 Programming With ASP.NET				
Sr. No	Topic	Detail	Weightage In %	Approx. Lectures
1	Framework And Web Contents Validation Controls	<ul style="list-style-type: none"> • Overview of Asp.NET Framework • Client Server Architecture • Application Web Servers • Installation of IIS server • Types of Files in Asp.NET • Types of controls in Asp.NET • Page Architecture, Adding Controls to a Webpage • The Page Class • Webfor • Introduction to standard Controls (Buttons, Textbox, Checkbox, Lable, Panel, Listbox, Dropdownlist etc.) • Running an Asp.Net Application, File Upload Control • What is Validation? • Client Side Validation • Server Side Validation • Types (RequiredField Validator, Range Validator, CompareField Validator, RegularExpression Validator, Custom Validator, ValidationSummery Control) 	20	12
2	State Management	<ul style="list-style-type: none"> • What is State? • Why is it Required in Asp.Net? • Client Side State Management • Server Side State Management • Various State Management Techniques (View State, Query String, Cookie, Session State, Application State) 	20	12
3	ADO.NET And Database	<ul style="list-style-type: none"> • Architecture of ADO.NET • Connected Architecture • DisConnected Architecture • ADO.NET Classes (Connection, Command, DataReader, DataAdapter, DataSet, DataColumn, DataRow, DataConstraints, DataView etc.) • The Gridview Control, The Repeater Control • Binding Data to DataBound Controls, • Diplaying Data in a webpage using SQLDataSource Control 	20	12

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		<ul style="list-style-type: none"> • DataBinding Expressions 		
4	Master Pages and Theme Caching, Application Pages And Data	<ul style="list-style-type: none"> • What is Master Page ? • Requirement Of a Master Page in an Asp.NET application • Designing Website with Master Page, Theme and CSS • Overview • Page Output Caching • Partial Page Caching, Absolute Cache Expiration • Sliding Cache Expiration • Data Caching 	20	12
5	Working With XML Asp.NET Application Configuration and Deployment of Application	<ul style="list-style-type: none"> • Reading Datasets From XML • Writing DataSets With XML • WebServices (Introduction, HTTP, SOAP, UDDI,XML, Creating a Web Servic, Consuming a Web Service) • Introduction To Web.Config • Common Configuration Sections • AppSettings • Tracing • Custom Errors • Authentication And Authorization • Deployment of Application in web server 	20	12
Total			100	60

Reference Books :

- (1) Asp.Net – Unleashed
- (2) Asp.Net – Wrox Publication
- (3) Programming With ASP.NET [ISBN: 978 - 81 - 909634 - 7 – 3] by Bharat & Company
- (4) Beginning.ASP.NET.3.5.in.C.Sharp.2008.From.Novice.to.Professional - Apress

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CS-27 Web Searching Technology and Search Engine Optimization				
Sr. No	Topic	Detail	Weightage In %	Approx. Lectures
1	The Search Engines: Reflecting Consciousness and Connecting Commerce Search Engine Basics	<ul style="list-style-type: none"> • The Mission of Search Engines • The Market Share of Search Engines • The Human Goals of Searching • Determining Searcher Intent: A Challenge for Both Marketers and Search Engines • How People Search? • How Search Engines Drive Commerce on the Web? • Eye Tracking: How Users Scan Results Pages? • Click Tracking: How Users Click on Results? Natural Versus Paid • Understanding Search Engine Results • Algorithm-Based Ranking Systems: Crawling, Indexing, and Ranking • Determining Searcher Intent and Delivering Relevant Fresh Content • Analyzing Ranking Factors • Using Advanced Search Techniques • Vertical Search Engines • Country-Specific Search Engines 	20	12

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2	Determining SEO Objectives and Defining Site's Audience First Stages of SEO	<ul style="list-style-type: none"> • Setting SEO Goals and Objectives • Developing an SEO Plan Prior to Site Development • Understanding Audience and Finding Niche • SEO for Raw Traffic • SEO for E-Commerce Sales • SEO for Mindshare/Branding • SEO for Lead Generation and Direct Marketing • SEO for Reputation Management • SEO for Ideological Influence • The Major Elements of Planning • Identifying the Site Development Process and Players • Defining Site's Information Architecture • Auditing an Existing Site to Identify SEO Problems • Identifying Current Server Statistics Software and Gaining Access • Determining Top Competitors • Assessing Historical Progress • Benchmarking Current Indexing Status • Benchmarking Current Rankings • Benchmarking Current Traffic Sources and Volume • Leveraging Business Assets for SEO • Combining Business Assets and Historical Data to Conduct SEO/Website SWOT Analysis 	20	12
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3	Developing an SEO-Friendly Website	<ul style="list-style-type: none"> • Making Site Accessible to Search Engines • Creating an Optimal Information Architecture • Root Domains, Subdomains, and Microsites • Optimization of Domain Names/URLs • Keyword Targeting • Content Optimization • Duplicate Content Issues Controlling Content with Cookies and Session IDs • Content Delivery and Search Spider Control • Redirects, Content Management System (CMS) Issues • Optimizing Flash • Best Practices for Multilanguage/Country Targeting 	20	12
4	Keyword Research, Optimizing for Vertical Search	<ul style="list-style-type: none"> • The Theory Behind Keyword Research • Traditional Approaches: Domain Expertise • Site Content Analysis • Keyword Research Tools • Determining Keyword Value/Potential ROI, Leveraging the Long Tail of Keyword Demand, Trending, Seasonality, and Seasonal Fluctuations in Keyword Demand • The Opportunities in Vertical Search • Optimizing for Local Search • Optimizing for Image Search • Optimizing for Product Search • Optimizing for News, Blog, and Feed Search • Others: Mobile, Video/Multimedia Search 	20	12

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5	Tracking Results and Measuring Success An Evolving Art Form: The Future of SEO	<ul style="list-style-type: none"> • Why Measuring Success Is Essential to the SEO Process • Measuring Search Traffic • Tying SEO to Conversion and ROI • Competitive and Diagnostic Search Metrics Key Performance • Indicators for Long Tail SEO • The Ongoing Evolution of Search • More Searchable Content and Content Types, Search becoming More Personalized and User-Influenced • Increasing Importance of Local, Mobile, and Voice • Recognition Search • Increased Market Saturation and Competition • SEO As an Enduring Art Form • 	20	12
Total			100	60

Reference Books:

- (1) The Art of SEO : Mastering Search Engine Optimization By Eric Enge, Stephan Spencer, Rand Fishkin, Jessie C Stricchiola, O'Reilly Media, October, 2009
- (2) Web Searching Technology and Search Engine Optimization[ISBN: 978 - 93 - 81786 - 92 - 5] by Bharat & Company
- (3) SEO: Search Engine Optimization Bible, By Jerri L. Ledford, 2nd Edition, Wiley India, April, 2009
- (4) SEO Warrior: Essential Techniques for Increasing Web Visibility By John I Jerkovic, O'Reilly Media, November, 2009

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CS-28 : Practical And Viva Based On CS – 25	
Topics	Marks
CS – 25	100

CS-29 : Practical And Viva Based On CS – 26 and CS-27	
Topics	Marks
CS – 26 and CS - 27	100

Note :

- Practical examination may be arranged before or after theory exam.

CS-30 : Project Viva	Total Marks: 100
Project must be developed in the computer laboratory of concern institute under the supervision of faculties of concern institute on any subject of previous semester or current semester. <u>(At the time of Project-Viva examination student must show all the Workouts, SDLC, Documentation, Program codes and project in running mode)</u>	

Note :

- Project must be submitted before two week of commencement of theory exam.
- Project viva examination may be arranged before or after theory exam.
- During the project viva examination project must be run.

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B.C.A. (Semester – VI)			
SR.NO	SUBJECT	NO. OF THEORY LECT. PER WEEK	NO. OF PRACTICAL PER WEEK
1	CS – 31 Mobile Computing using Android and iPhone	5	-
2	CS – 32 Data Warehousing with SQL Server 2012	5	-
3	CS – 33 Programming in Python	5	-
4	CS – 34 Practical - 1 (based on CS-31)	-	6
5	CS – 35 Practical – 2 (based On CS-32 and CS-33)	-	6
6	CS – 36 Project Viva	-	6

Note:

- (1) Credit of each subject is 5. Total credit of semester is 36.
- (2) Total marks of each theory paper are 100 (university examination 70 marks + internal examination 30 marks).
- (3) Total marks of each practical and project-viva paper are 100. No internal examination marks in practical and project-viva papers.

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CS-31 Mobile Computing using Android and iPhone				
Sr. No	Topic	Detail	Weight age In %	Approx . Lectures
1	Introduction to Android Android Application Design	<ul style="list-style-type: none"> • The Open Handset Alliance • The Android Platform, Android SDK • Building a sample Android application • Anatomy of an Android applications • Android terminologies • Application Context, Activities, Services, Intents • Receiving and Broadcasting Intents • Android Manifest File and its common settings • Using Intent Filter, Permissions • Managing Application resources in a hierarchy • Working with different types of resources 	20	12
2	Android User Interface Design	<ul style="list-style-type: none"> • User Interface Screen elements <ul style="list-style-type: none"> ○ Button, EditText, TextView, DatePicker, TimePicker, ProgressBar, ListView, GridView, RadioGroup, ImageButton, Fragement • Designing User Interfaces with Layouts <ul style="list-style-type: none"> ○ Relative Layout, Linear Layout, Table Layout etc • Dialogs • Drawing and Working with Animation <ul style="list-style-type: none"> ○ Frame By Frame Animation ○ Twined Animation 	20	12
3	Database Connectivity Using SQLite and Content Provider	<ul style="list-style-type: none"> • Using Android Data and Storage APIs • Managing data using SQLite • Sharing Data Between Applications with Content Providers 	20	12

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4	Location Based Services (LBS), Common Android API, Notifications, Services, Deployment of applications	<ul style="list-style-type: none"> • Using Global Positioning Services (GPS) • Geocoding Locations • Mapping Locations • Many more with location based services • Android networking API • Android web API • Android telephony API • Notifying the user, Notifying with the status bar • Vibrating the phone • Blinking the lights • Customizing the notifications Services • Application development using JSON in MySQL • Publish android application 	20	12
5	Introduction To iPhone	<ul style="list-style-type: none"> • Introduction To X-Code (IDE) • Framework, Design User Interface for button, text view, text field, etc. • Creating And Building Simple Application • Cocoa Touch And MVC 	20	12
TOTAL			100	60

Notes: Android application must be developed using ANDROID STUDIO.

Reference Books:

- (1) Android Wireless Application Development By Lauren Darcey and Shane Conder, Pearson Education, 2nd ed. (2011)
- (2) Beginning iOS 6 Development By David Mark , Jack Nutting , Jeff LaMarche , Fredrik Olsson Apress Publication.
- (3) Using SQLite By Jay A. Kreibich, Publisher: O'Reilly Media
- (4) Mobile Computing using Android and iPhone [ISBN: 978-93-81786-93-2] by Bharat & Company
- (5) Professional Android 2 Application Development Reto Meier, Wiley India Pvt Ltd (2011)
- (6) Beginning Android Mark L Murphy, Wiley India Pvt Ltd

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CS –32 Data Warehousing with SQL Server 2012				
No.	Topic	Detail	Weightage in %	Min. Lect.
1	Introduction to Data Warehousing	<ul style="list-style-type: none"> • What Is a Data Warehouse? • Data Warehousing Today • Future Trends in Data Warehousing. • Data Warehouse Architecture • Data Flow Architecture 	20	12
2	Designing and Implementation of Data Warehousing	<ul style="list-style-type: none"> • Logical Design for data warehouse • Physical Design for data warehouse • Design dimension table, fact table for data warehouse • Design and implement effective physical data structure for data warehouse 	20	12
3	Creating ETL Solutions with SSIS, Implementing Control Flow in SSIS	<ul style="list-style-type: none"> • Introduction to ETL with SSIS • Exploring data sources • Implementing data flow using SSIS • Introduction to Control Flow • Creating Dynamic Packages • Using Containers 	20	12
4	Enforcing Data Quality, Extending SQL Server Integration Services	<ul style="list-style-type: none"> • Introduction to Data Quality • Using Data Quality Service to Cleanse data • Using Data Quality Service to match data • Using Scripts in SSIS • Using Custom components in SSIS 	20	12
5	Deploying and Configuring SSIS Packages, Consuming	<ul style="list-style-type: none"> • Overview of SSIS Development • Deploying SSIS Projects • Planning SSIS Package 	20	12

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	Data in Data Warehouse	Execution <ul style="list-style-type: none"> • Introduction to Business Intelligence • Introduction to Reporting • Introduction to Data Analysis 		
			100	60

Notes: For Lab Practice : Microsoft SQL Server 2012 or Higher version

Reference Books:

- (1) Implementing a Data Warehouse with Microsoft® SQL Server® 2012 Dejan Sarka Matija Lah Grega Jerkič
- (2) Building a Data Warehouse: With Examples in SQL Server – Vincent Rainardi-Apress (2014)
- (3) Data mining Explained A manager’s guide to customer centric business intelligence by
- (4) Data mining by Pieter Adriaans, Dolf Zantinge
- (5) Data warehousing in the real world A practical guide for business DSS by Sam Anahory,

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CS-33: Programming in Python				
Sr. No.	Topic	Detail	Weightage In %	Approx. Lectures
1	Introduction to Python	The basic elements of Python, Branching programs, Strings and Input, Iteration, Functions and Scoping, Specifications, Recursion, Global variables, Modules, Files, Tuples, Lists and Mutability, Functions as Objects, Strings, Tuples and Lists, Dictionaries	20	12
2	OOP using Python	Handling exceptions, Exceptions as a control flow mechanism, Assertions, Abstract Data Types and Classes, Inheritance, Encapsulation and information hiding, Search Algorithms, Sorting Algorithms, Hashtables	20	12
3	Plotting using PyLab	Plotting using PyLab, Plotting mortgages and extended examples, Fibonacci sequence revisited, Dynamic programming and the 0/1 Knapsack algorithm, Dynamic programming and divide and conquer	20	12
4	Regular Expressions	Special Symbols and Characters, Regexes and Python, A Longer Regex example (like Data Generators, matching a string etc.) Text Processing: Comma Sepearated values, JavaScript Object Notation (JSON), Python and XML Case Study: Create Regular expressions (Custom), Process telephone numbers, Generate log data, HTML Generators, Tweet Scrub, Amazone ScreenScrapper, Mailmerge	20	12
5	Python and Data Analytics	Understand the problem By Understanding the Data Predictive Model Building: Balancing Performance, Complexity, and the Big Data	20	12
Total			100	60

Reference Books:

- 1) John V Guttag. "Introduction to Computation and Programming Using Python", Prentice Hall of India
- 2) Wesley J Chun, Core Python Applications Programming, 3rd Edition. Pearson
- 3) Michael Bowles, Machine Leaning in Python, Esssential techniques for predictive analysis, Wiley
- 4) Allen Downey, Jeffrey Elkner and Chris Meyers "How to think like a Computer Scientist, Learning with Python", Green Tea Press
- 5) Alex Martelli, Python Cookbook, O'REILLY

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CS-34 : Practical And Viva Based On CS – 31	
Topics	Marks
CS – 31	100

CS-35 : Practical And Viva Based On CS – 32 and CS-33	
Topics	Marks
CS – 32 and CS – 33	100

Note :

- Practical examination may be arranged before or after theory exam.

CS-36: Project Viva	Total Marks: 100
Project must be developed in the computer laboratory of concern institute under the supervision of faculties of concern institute on any subject of semester-V or semester-VI. <u>(At the time of Project-Viva examination student must show all the Workouts, SDLC, Documentation, Program codes and project in running mode)</u>	

Note :

- Project must be submitted before two week of commencement of theory exam.
- Project viva examination may be arranged before or after theory exam.
- During the project viva examination project must be run.