# SAURASHTRA UNIVERSITY

# RAJKOT – INDIA



## CURRICULAM

## FOR

## B.C.A.

**Bachelor of Computer Application**

**(Semester V ~~and Semester VI~~)**

**Effective from June – 2021**

| | | | |
|---|---|---|---|
| **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.

| Course Outcomes | |
|---|---|
| 1. | Understand and implements RMI, JSP & JDBC applications. |
| 2. | Understand and apply the concept of servlet for developments. |
| 3. | Understand different listeners and interface which used for servlet programming. |
| 4. | Understand and apply the concept of jsp program for developments. |
| 5. | Understand and apply concept of MVC and tag Libraries. |

| CS-25 Advanced Java Programming (J2EE) | | | | |
|---|---|---|---|---|
| **Sr. No** | **Topics** | **Details** | **Weightage in %** | **Approx Lectures** |
| 1 | **The J2EE Platform, JDBC (Java Database Connectivity)** | • Introduction to J2EE <br> • Enterprise Architecture Styles: <br>   ▪ Two-Tier Architecture <br>   ▪ Three-Tier Architecture <br>   ▪ N-Tier Architecture <br> • Enterprise Architecture <br> • The J2EE Platform <br> • Introduction to J2EE APIs (Servlet, JSP, EJB, JMS, JavaMail, JSF, JNDI) <br> • Introduction to Containers <br> • Tomcat as a Web Container <br> • Introduction of JDBC <br> • JDBC Architecture <br> • Data types in JDBC <br> • Processing Queries <br> • Database Exception Handling <br> • Discuss types of drivers <br> • JDBC Introduction and Need for JDBC <br> • JDBC Architecture <br> • Types of JDBC Drivers <br> • JDBC API for Database Connectivity (java.sql package) <br> • Statement, PreparedStatement <br> • CallableStatement <br> • ResultSetMetaData <br> • DatabaseMetaData <br> • Other JDBC APIs <br> • Connecting with Databases (MySQL, Access, Oracle) | 20 | 12 |

| 2 | RMI Servlet | <ul><li>RMI overview</li><li>RMI architecture</li><li>Stub and Skeleton</li><li>Developing and Executing RMI application</li><li>Servlet Introduction</li><li>Architecture of a Servlet</li><li>Servlet API (Javax.servlet and avax.servlet.http)</li><li>Servlet Life Cycle</li><li>Developing and Deploying Servlets</li><li>Handling Servlet Requests and Responses</li><li>Reading Initialization Parameters</li><li>Session Tracking Approaches (URL Rewriting, Hidden Form Fields, Cookies, Session API)</li><li>Servlet Collaboration</li><li>Servlet with JDBC</li></ul> | 20 | 12 |
| 3 | JSP, Java Beans | <ul><li>Introduction to JSP and JSP Basics</li><li>JSP vs. Servlet</li><li>JSP Architecture</li><li>Life cycle of JSP</li><li>JSP Elements: Directive Elements, Scripting Elements, Action Elements<ul><li>Directives Elements (page, include, taglib)</li><li>Scripting Elements (Declaration, scriptlet, expression)</li><li>Action Elements (JSP:param, JSP:include, JSP:Forward, JSP:plugin)</li></ul></li><li>JSP Implicit Objects</li><li>JSP Scope</li><li>Including and Forwarding from JSP Pages</li><li>include Action</li><li>forward Action</li><li>Working with Session & Cookie in JSP</li><li>Error Handling and Exception Handling with JSP</li><li>JDBC with JSP</li><li>JavaBean Properties</li><li>JavaBean Methods</li><li>Common JavaBean packaging</li></ul> | 20 | 12 |

| 4 | MVC Architecture, EJB, Hibernate | • Introduction to MVC<br>• Implementation of MVC Architecture<br>• Introduction<br>• Benefits of EJB<br>• Restriction on EJB<br>• Types of EJB<br>• Session Beans<br>• Entity Beans<br>• Message-driven beans<br>• Timer service<br>• Introduction to Hibernate<br>• Need for hibernate<br>• Features of hibernate<br>• Disadvantages of Hibernate<br>• Exploring Hibernate Architecture<br>• Downloading and Configuring and necessary files to Hibernate in Eclipse<br>• Jars files of hibernate.<br>• Hibernate Configuration file<br>• Hibernate Mapping file<br>• Basic Example of Hibernate<br>• Annotation<br>• Hibernate Inheritance<br>• Inheritance Annotations<br>• Hibernate Sessions | 20 | 12 |
| 5 | Spring, Struts | • Introduction of Spring Framework<br>• Spring Architecture<br>• Spring Framework definition<br>• Spring & MVC<br>• Spring Context definition<br>• Inversion of Control (IoC) in Spring<br>• Aspect Oriented programming in Spring (AOP)<br>• Understanding Struts Framework<br>• Comparision with MVC using RequestDispatcher and the EL<br>• Struts Flow of Control<br>• Processing Requests with Action Objects<br>• Handling Request Parameters with FormBeans<br>• Prepopulating and Redisplaying Input Forms<br>• Using Properties Files | 20 | 12 |
| | | Total | 100 | 60 |

**Reference Books:**

(1) Java Complete Reference 11th Edition  - Herbert Schildt, Oracle Press
(2) Java Server Programming For Professionals, Ivan Bayross, Sharanam Shah – Shroff publication
(3) Developing Java Servlets – Techmedia
(4) JSP Beginner's Guide – Tata McGraw Hill by Gary Bolling, Bharathi Nataragan
(5) Spring and Hibernate, K. Santosh Kumar, - Tata McGraw-Hill
(6) Hibernate Made Easy: Simplified Data Persistence with Hibernate and JPA (Java Persistence API) Annotations by Cameron Wallace McKenzie, Kerri Sheehan
(7) Spring Framework: A Step by Step Approach for Learning Spring Framework - CreateSpace Independent Publishing Platform
(8) Beginning Hibernate Second Edition By Jeff Linwood, Dave Minte - APress

| Course Outcomes |
| --- |
| 1. Understand the ASP.NET framework and different controls. |
| 2. Understand form validation, apply form validation control also understand state management. |
| 3. Understand ADO.Net architecture and developing application with LINQ. |
| 4. Understand and apply concept of MasterPage, CSS & Theme |
| 5. Understand application configuration with XML |

| | | CS-26 Programming With ASP.NET | | |
| --- | --- | --- | --- | --- |
| Sr. No | Topic | Detail | Weightage In % | Approx. Lectures |
| 1 | Framework And Web Contents Validation Controls | • Overview of Asp.NET Framework<br>• Client Server Architecture<br>• Application Web Servers<br>• Installation of IIS server<br>• Types of Files in Asp.NET<br>• Types of controls in Asp.NET<br>• Page Architecture, Adding Controls to a Webpage<br>• The Page Class<br>• Webfor<br>• Introduction to standard Controls ( Buttons, Textbox, Checkbox, Lable, Panel, Listbox, Dropdownlist etc.)<br>•     Running an Asp.Net Application, File Upload Control<br>• What is Validation?<br>• Client Side Validation<br>• Server Side Validation<br>• Types ( RequieredField Validator, Range Validator, CompareField Validator, RegularExpression Validator, Custom Validator, ValidationSummery Control) | 20 | 12 |
| 2 | State Management | • What is State?<br>• Why is it Required in Asp.Net?<br>• Client Side State Management<br>• Server Side State Management<br>• Various State Management Techniques (View State, Query String, Cookie, Session State, Application State) | 20 | 12 |
| 3 | ADO.NET And Database | • Architecture of ADO.NET<br>• Connected Architecture<br>• DisConnected Architecture | 20 | 12 |

| | | | | |
|---|---|---|---|---|
| | | • ADO.NET Classes ( Connection, Command, <br>• DataReader, DataAdapter, DataSet, DataColumn, DataRow, DataConstraints, DataView etc.) <br>• The Gridview Control, The Repeater Control <br>• Binding Data to DataBound Controls, <br>• Diplaying Data in a webpage using SQLDataSource Control <br>• DataBinding Expressions | | |
| 4 | Master Pages and Theme Caching, Application Pages And Data | • What is Master Page ? <br>• Requirement Of a Master Page in an Asp.NET application <br>• Designing Website with Master Page, Theme and CSS <br>• Overview <br>• Page Output Caching <br>• Partial Page Caching, Absolute Cache Expiration <br>• Sliding Cache Expiration <br>• Data Caching | 20 | 12 |
| 5 | Working With XML Asp.NET Application Configuration and Deployment of Application | • Reading Datasets From XML <br>• Writing DataSets With XML <br>• WebServices (Introduction, HTTP, SOAP, UDDI,XML, Creating a Web Servic, Consuming a Web Service) <br>• Introduction To Web.Config <br>• Common Configuration Sections <br>• AppSettings <br>• Tracing <br>• Custom Errors <br>• Authentication And Authorization <br>• Deployment of Application in web server | 20 | 12 |
| | | **Total** | **100** | **60** |

**Reference Books :**
(1) Asp.Net – Unleashed
(2) Asp.Net – Wrox Publication
(3) Pro ASP.NET Core MVC 2 Book by Adam Freeman
(4) Introduction to ASP.NET Web Programming Using the Razor Syntax (C#) by Tom FitzMacken

| Course Outcomes |
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| 1. Understand basic of search engines and reflecting |
| 2. Understand SEO objectives and defining site audience. |
| 3. Apply and Implement SEO friendly website with all SEO concept. |
| 4. Understand keyword research and apply it for website developments. |
| 5. To track the results and measuring the success to SEO process |

| 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** | • The Mission of Search Engines<br>• The Market Share of Search Engines<br>• The Human Goals of Searching<br>• Determining Searcher Intent: A Challenge for Both Marketers and Search Engines<br>• How People Search?<br>• How Search Engines Drive Commerce on the Web?<br>• Eye Tracking: How Users Scan Results Pages?<br>• Click Tracking: How Users Click on Results? Natural Versus Paid<br>• Understanding Search Engine Results<br>• Algorithm-Based Ranking Systems: Crawling, Indexing, and Ranking<br>• Determining Searcher Intent and Delivering Relevant<br>• Fresh Content<br>• Analyzing Ranking Factors<br>• Using Advanced Search Techniques<br>• Vertical Search Engines<br>• Country-Specific Search Engines | 20 | 12 |

| 2 | Determining SEO Objectives and Defining Site's Audience First Stages of SEO | • Setting SEO Goals and Objectives<br>• Developing an SEO Plan Prior to Site Development<br>• Understanding Audience and Finding Niche<br>• SEO for Raw Traffic<br>• SEO for E-Commerce Sales<br>• SEO for Mindshare/Branding<br>• SEO for Lead Generation and Direct Marketing<br>• SEO for Reputation Management<br>• SEO for Ideological Influence<br>• The Major Elements of Planning<br>• Identifying the Site Development Process and Players<br>• Defining Site's Information Architecture<br>• Auditing an Existing Site to Identify SEO Problems<br>• Identifying Current Server Statistics Software and Gaining Access<br>• Determining Top Competitors<br>• Assessing Historical Progress<br>• Benchmarking Current Indexing Status<br>• Benchmarking Current Rankings<br>• Benchmarking Current Traffic Sources and Volume<br>• Leveraging Business Assets for SEO<br>• Combining Business Assets and Historical Data to Conduct SEO/Website SWOT Analysis | 20 | 12 |

| 3 | Developing an SEO-Friendly Website | • Making Site Accessible to Search Engines<br>• Creating an Optimal Information Architecture<br>• Root Domains, Subdomains, and Microsites<br>• Optimization of Domain Names/URLs<br>• Keyword Targeting<br>• Content Optimization<br>• Duplicate Content Issues Controlling Content with Cookies and Session IDs<br>• Content Delivery and Search Spider Control<br>• Redirects, Content Management System (CMS) Issues<br>• Optimizing Flash<br>• Best Practices for Multilanguage/Country Targeting | 20 | 12 |
| 4 | Keyword Research, Optimizing for Vertical Search | • The Theory Behind Keyword Research<br>• Traditional Approaches: Domain Expertise<br>• Site Content Analysis<br>• Keyword Research Tools<br>• Determining Keyword Value/Potential ROI, Leveraging the Long Tail of Keyword Demand, Trending, Seasonality, and Seasonal Fluctuations in Keyword Demand<br>• The Opportunities in Vertical Search<br>• Optimizing for Local Search<br>• Optimizing for Image Search<br>• Optimizing for Product Search<br>• Optimizing for News, Blog, and Feed Search<br>• Others: Mobile, Video/Multimedia Search | 20 | 12 |

| 5 | Tracking Results and Measuring Success An Evolving Art Form: The Future of SEO | • Why Measuring Success Is Essential to the SEO Process<br>• Measuring Search Traffic<br>• Tying SEO to Conversion and ROI<br>• Competitive and Diagnostic Search Metrics Key Performance<br>• Indicators for Long Tail SEO<br>• The Ongoing Evolution of Search<br>• More Searchable Content and Content Types, Search becoming More Personalized and User-Influenced<br>• Increasing Importance of Local, Mobile, and Voice<br>• Recognition Search<br>• Increased Market Saturation and Competition<br>• SEO As an Enduring Art Form<br>• | 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, 3$^{rd}$ Edition October, 2015

(2) Google SEO Bible, Beginner's Guide to SEO, ISBN-978-1700098733, moaml mohmmed, 2019

(3) SEO Warrior: Essential Techniques for Increasing Web Visibility By John I Jerkovic, O'Reilly Media, November, 2009

| 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. **(At the time of Project-Viva examination student must show all the Workouts, SDLC, Documentation, Program codes and project in running mode)** |

**Note:**
- Project must be submitted before two weeks 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.