# COURSEPACK

**SCHEME**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Title** | Web Technology | | | | **Course Type** | | | **Integrated** | | |
| **Course Code** | R1UC602C | | | | **Class** | | | B.Tech | | |
| **Instruction delivery** | **Activity** | **Credits** | **Credit Hours** | | **Total Number of Classes per Semester** | | | | **Assessment in Weightage** | |
| **Lecture** | 3 | 3 | |
| **Tutorial** | 0 | 0 | | **Theory** | **Tutorial** | **Practical**  **Practical** | **Self-study** | **CIE** | **SEE** |
| **Practical** | 1 | 2 | |
| **Self-study** | 0 | 0 | |
| **Total** | 4 | 5 | | 45 | 0 | 15 |  | **50%** | **50%** |
| **Course Lead** | Dr. Avinash Dwivedi | | | **Course Coordinator** | Dr. Maheshwari Niranjan | | | | | |
| **Names Course Instructors** | **Theory** | | | | **Practical** | | | | | |
| 1. Dr. Avinash Dwivedi 2. Dr. Bharat Bhushan Naib 3. Dr. G. Sakthi 4. Dr. Santosh Kumar 5. Dr. Jitendra Tanwar 6. Dr. P Ramesh 7. Dr. Suveg Moudgil 8. Dr. T. Ganesh Kumar 9. Dr. Vinay Kumar Pandey 10. Mr. Amit Kumar 11. Mr. Ajay Shankar 12. Dr. Arshad Husain 13. Dr. Arvind Panwar 14. Dr.C. Ramesh Kumar 15. Ms. Indervati 16. Ms. Isha Chopra 17. Mr. K. Rajkannab 18. Ms. Kimmi Gupta 19. Dr. Maheshwari Niranjan 20. Ms. Neha Bagwari 21. Dr. Ravi Sharma 22. Mr. Rochak Swami 23. Dr. Swati Sharma 24. Dr. V. Jankiraman | | | | 1. Dr. Avinash Dwivedi 2. Dr. Bharat Bhushan Naib 3. Dr. G. Sakthi 4. Dr. Santosh Kumar 5. Dr. Jitendra Tanwar 6. Dr. P Ramesh 7. Dr. Suveg Moudgil 8. Dr. T. Ganesh Kumar 9. Dr. Vinay Kumar Pandey 10. Mr. Amit Kumar 11. Mr. Ajay Shankar 12. Dr. Arshad Husain 13. Dr. Arvind Panwar 14. Dr.C. Ramesh Kumar 15. Ms. Indervati 16. Ms. Isha Chopra 17. Mr. K. Rajkannab 18. Ms. Kimmi Gupta 19. Dr. Maheshwari Niranjan 20. Ms. Neha Bagwari 21. Dr. Ravi Sharma 22. Mr. Rochak Swami 23. Dr. Swati Sharma 24. Dr. V. Jankiraman | | | | | |

**COURSE OVERVIEW**

This course focuses on the World Wide Web as a platform for interactive applications and content sharing. The development of web-based applications requires knowledge about the underlying technology and the formats and standards the web is based upon. In this course you will learn about the HTTP communication protocol, the markup languages HTML, XHTML and XML, and the CSS for formatting and transforming web content, interactive graphics and multimedia content on the web, client-side programming using JavaScript and server side scripting like SERVLET/ JSP and JSP along with database connectivity for dynamic web development.

**PREREQUISITE COURSE**

|  |  |  |
| --- | --- | --- |
| **PREREQUISITE COURSE REQUIRED** | No | |
| **If, yes please fill in the Details** | **Prerequisite course code** | **Prerequisite course name** |
| **NA** | **NA** |

**COURSE OBJECTIVE**

1. To understand different skills for creating web sites considering both client and server side.
2. To apply different techniques for designing responsive web applications.
3. To analyze strategies to develop server side applications.
4. To develop dynamic websites.

## COURSE OUTCOMES (COs)

After the completion of the course, the student will be able to:

|  |  |
| --- | --- |
| **CO No.** | **Course Outcomes** |
| R1UC602C.1 | Understand various responsive web development protocol, services and strategies used in web based system. |
| R1UC602C.2 | Apply different Web development techniques like HTML, CSS, JavaScript, XML, AJAX |
| R1UC602C.3 | Apply Server side techniques JSP and SERVLET to build responsive and dynamic user interfaces with Java Database Connectivity (JDBC) |
| R1UC602C.4 | Analyze different client side and server side development strategies along with database connectivity for developing dynamic web pages. Design and Develop web applications in real time scenario. |

**PROGRAM OUTCOMES (POs):**

|  |  |
| --- | --- |
| **PO1** | **Computing Science knowledge:** Apply the knowledge of mathematics, statistics, computing science and information science fundamentals to the solution of complex computer application problems. |
| **PO2** | **Problem analysis:** Identify, formulate, review research literature, and analyze complex computing science problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and computer sciences**.** |
| **PO3** | **Design/development of solutions:** Design solutions for complex computing problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. |
| **PO4** | **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions. |
| **PO5** | **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern computing science and IT tools including prediction and modeling to complex computing activities with an understanding of the limitations. |
| **PO6** | **IT specialist and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional computing science and information science practice. |
| **PO7** | **Environment and sustainability**: Understand the impact of the professional computing science solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development. |
| **PO8** | **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the computing science practice. |
| **PO9** | **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings. |
| **PO10** | **Communication:** Communicate effectively on complex engineering activities with the IT analyst community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions. |
| **PO11** | **Project management and finance:** Demonstrate knowledge and understanding of the computing science and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments. |
| **PO12** | **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. |

# PROGRAMME SPECIFIC OUTCOME (PSO):

## The students of Computer Science and Engineering shall:

**PSO1:** Have the ability to work with emerging technologies in computing requisite to Industry 4.0.

**PSO2:** Demonstrate Engineering Practice learned through industry internship and research project to solve live problems in various domains

## BLOOM’S LEVEL OF THE COURSE OUTCOMES

**INTEGRATED**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CO No. | Remember  **BTL1** | Understand  **BTL2** | Apply  **BTL3** | Analyse  **BTL4** | Evaluate  **BTL2** | Create  **BTL6** |
| R1UC602C.1 | √ | √ |  |  |  |  |
| R1UC602C.2 |  |  | √ |  |  |  |
| R1UC602C.3 |  |  |  | √ | √ |  |
| R1UC602C.4 |  |  |  |  |  | √ |

**PROGRAM OUTCOMES (POs):** AS DEFINED BY CONCERNED THE APEX BODIES

## COURSE ARTICULATIONMATRIX

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **COs#/ POs** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
| R1UC602C.1 |  | 3 |  |  |  |  |  |  |  |  |  |  |  |  |
| R1UC602C.2 |  |  | 3 | 2 |  |  |  |  |  |  |  | 1 |  |  |
| R1UC602C.3 |  |  | 3 | 2 | 2 |  |  |  |  |  |  | 2 |  |  |
| R1UC602C.4 |  |  | 3 |  | 2 |  |  |  |  |  |  | 2 | 3 |  |

**Note:** 1-Low, 2-Medium, 3-High

**COURSE CONTENT**

|  |
| --- |
| **Content** |
| **THEORY:**  **WEB SITE BASICS AND HTML5**  **Web Essentials**:Clients, Servers, and Communication-The Internet – Basic Internet protocols – WWW – HTTP Request Message –HTTP Response Message – Web Clients- Web Servers-Web development strategies- **Introduction to HTML5:** Basic Elements, Form Elements, Media Elements, HTML5 Graphics (Canvas, SVG)-XHTML:  Syntax and Semantics-Case Study: Create a static Website.  **FRONT END DESIGN USING CSS3 AND BOOTSTRAP FRAMEWORK**  **CSS** : Types of CSS, CSS Properties -CSS3: Selector String, Box Model, Text Properties, CSS 3D Transformation, CSS Animation- **Bootstrap Framework:** BS Grid, Tables, Images, Alerts, Form Elements. **Representing Web Data**: Basic XML- DTD- Namespaces-XML Schema, DOM, XSL and XSLT Transformation- **Case study:** Online Blog Creation  **DYNAMIC WEB PAGE DESIGN USING JAVA SCRIPT AND JQUERY Java Script:** Data Types and Variables -Operators - Control Statements - Functions -Objects - Build in Objects - DOM - Java Script Event Handling - Form Handling and validations - **AJAX & JQuery:** Introduction- Ajax Client Server Architecture- Ajax Client Server Architecture-XML Http Request Object-Call Back Methods-JQuery Selectors - JQuery Animations - Effects - Event Handling - JQuery DOM Traversing-JSON - JQuery AJAX-  **Server-side programming using SERVLET/ JSP**  Introduction to Apache-Tomcat Server- deployment of web resources, Lifecycle of a SERVLET, deploying a SERVLET, The SERVLET API, Reading SERVLET parameters, Reading initialization parameters, Handling Http Request & Responses, Session management, connecting to a database using JDBC.  Case study: Todo list.  **Server-side programming using JSP**  Introduction to JSP: Basics of JSP-JSP vs SERVLET-JSP Architecture, JSP Processing, Declarations, Directives, Expressions, Code Snippets, implicit objects, Session tracking, Java beans classes and JSP-Tag Libraries and Files-Support for the Model-View-Controller Paradigm- Databases and JSP  **Introduction to Java frameworks**- Spring, Spring Boot, Spring MVC  **PRACTICAL:** Implementation of **HTML basic tags**, Designing static web pages, Styling of web pages using **Inline/Internal/External CSS**, Implementing HTML **iframes**, Creating User Registration Form, Performing client side form validations using **JavaScript**, **Event handling** in JavaScript, Developing client side applications using HTML, CSS and JavaScript, Developing responsive and mobile-first websites using **Bootstrap**, Implementation of AJAX, Designing server side web pages using SERVLET/ JSP / **Java server pages (JSP)**, Developing dynamic websites using Data base connectivity with SERVLET/ JSP/JSP; Session management using different techniqus |

**LESSON PLAN FOR COMPREHENSIVE COURSES**

**FOR THEORY 15 weeks \* 3 Hours = 45 Classes) (1credit = 1Lecture Hour)  
FOR PRACTICAL 15 weeks \* 2Hours = 30 Hours lab sessions (1 credit = 2 lab hours)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **L-No** | **Topic for Delivery** | **Theory / Tutorial / Practical**  **Plan** | **Skill** | **Competency** |
| 1 | Introduction to web: WWW, Web Browsers , Clients, Servers, and Communication | **Theory** | Understand various web development strategies. | WEB SITE BASICS AND HTML5  Designing and styling static websites. |
| 2 | The Internet – Basic Internet protocols Web development strategies, | **Theory** |
| 3 | HTML: basic tag, elements, attributes, formatting, comments, marquee, list | **Theory** |
| 4 | Write a simple HTML code to display data / content on a web page. | Practical |
| 5 | Practical |
| 6 | HTML: table, images, Frames | **Theory** | Designing user interfaces for web platform |
| 7 | HTML: forms, methods (get, post) | **Theory** |
| 8 | HTML: links: text, email, Media Elements, HTML5 Graphics (Canvas, SVG) | **Theory** |
| 9 | Write an HTML code to display your CV on a web page  Write an HTML code to implement the concept of frames with 2 frames: 1 for hyperlinks and another for opening the content to that link | Practical |
| 10 | Practical |
| 11 | XHTML: Syntax and Semantics; | Theory |
| 12 | XML: DTD, XML schemes, presenting and using XML DOM, XSL and XSLT Transformation | Theory | Sharing of data in structural form over web pages. |
| 13 | Introduction to CSS, CSS: color, background, fonts, images and links | Theory | Students are aware about the different styling options for creating user interface over web |
| 14 |  | Practical | Building standalone applications |
| 15 | Practical |
| 16 | CSS: table, margins, lists | Theory | Students are aware about the different styling options for creating user interface over web |
| 22 | CSS: border, paddings, scroll, CSS class | Theory |
| 23 | CSS3: border Image, round corner, CSS3: text shadow, layers, Revision: HTML and CSS basics | Theory |
| 24 | Design HTML form for keeping student record and validate it using Java script. | Practical | Record Management of visitors of website. |
| 25 | Practical |
| 26 | Bootstrap3 - making grids for mobile-first responsive web applications | Theory | Students are aware about the different styling options for creating user interface over web |
| 27 | Bootstrap3 – designing navigation bar in responsive applications | Theory |
| 28 | Revision | Theory |
| 29 | Complete Web page with HTML and CSS using bootstrap | Practical | Creating server side web pages | Performing client side validation and designing local web applications. |
| 30 | Practical |
| 31 | JavaScript: Introduction, object model | Theory | Validating Forms at client side |
| 32 | JavaScript: handling forms, statements | Theory |
| 33 | JavaScript: functions, and objects | Theory |
| 34 | Write a JavaScript to design a simple calculator to perform the following operations: sum, product, difference and quotient | Practical | creating server side scripts using JSP |
| 35 | Practical |
| 36 | DOM - Java Script Event Handling - Form Handling and validations | Theory | Event handling to design local web applications |
| 37 | JavaScript: Error handling, and validation | Theory |
| 38 | Introduction AJAX, Ajax Client Server Architecture- Ajax Client Server Architecture-XML Http Request Object-Call Back Methods | Theory |
| 39 |  | Practical | Design mobile responsive web pages | Design mobile responsive web sites |
| 40 | Practical |
| 41 | JQuery Selectors - JQuery Animations - Effects - Event Handling - | Theory |
| 42 | JQuery DOM Traversing-JSON - JQuery AJAX | Theory |
| 43 | Revision | Theory | creating server side scripts using JSP |
| 44 | Implementation of JSP to generate server side response Write a JSP code to generate dynamic webpage using server response Write a code to create a navigation bar using Bootstrap and create a responsive website for your Institute. | Practical | Design websites with multiple webpage navigation |
| 45 | Practical |
| 46 | Introduction to Apache-Tomcat Server- deployment of web resources | Theory | creating server side scripts using JSP | Design complete dynamic websites along with server side services using databse |
| 47 | Lifecycle of a SERVLET/ JSPs, deploying a SERVLET/ JSPs, Deployment descriptor | Theory |
| 48 | The SERVLET/ JSPs API, Reading SERVLET/ JSPs parameters | Theory |
| 49 | Write a program using SERVLET/ JSP and HTML to create a form and display the details entered by the user. Install and configure SERVLET/ JSP: web server | Practical | Database connectivity for storage of data |
| 50 | Practical |
| 51 | Reading initialization parameters, Handling Http Request & Responses | Theory | creating server side scripts using JSP |
| 52 | Session management: session, cookies, hidden form field & URLrewrite | Theory | Using SERVLET/ JSP to provide server side services like form processing and file handling |
| 53 | connecting to a database using JDBC | Theory |
| 54 | Write a program using SERVLET/ JSP and HTML to create a form and display the details entered by the user. Install and configure SERVLET/ JSP: web server, MYSQL/Oracle  Write a program in SERVLET/ JSP to display content on a web page.  Write a simple SERVLET/ JSP program using expressions and operators. | Practical |
| 55 | Practical |
| 56 | SERVLET/ JSP Navigation: within and outside application | Theory |
| 57 | Revision | Theory |
| 58 | Requirement of JSP, Basics of JSP-JSP vs SERVLET/ JSPs, JSP Architecture, JSP Processing | Theory |
| 59 | SERVLET/ JSP Navigation: within and outside application | Practical |
| 60 | Practical |
| 61 | JSP: declaring variables and methods | Theory | Database connectivity for storage of data |
| 62 | JSP Directives, Expressions | Theory |
| 63 | Code Snippets, implicit objects | Theory |
| 64 | Create a SERVLET/ JSP/ JSP page for login system using session | Practical | Managing sessions, cookies using SERVLET/ JSP |
| 65 | Practical |
| 66 | Session tracking | Theory |
| 67 | Java beans classes and JSP-Tag Libraries | Theory |
| 68 | Files-Support for the Model-View-Controller Paradigm- Databases and JSP | Theory |
| 69 | Write simple SERVLET/ JSP program to set cookies and read it | Practical |
| 70 | Practical |
| 71 | Introduction to Java frameworks- Spring | Theory | errors and exceptions handling using SERVLET/ JSP by server. |
| 72 | Spring Boot | Theory |
| 73 | Spring MVC | Theory |
| 74 | Write a SERVLET/ JSP / JSP program for sending e-mail | Practical | Create and send customized mails using SERVLET/ JSP |
| 75 | Practical |

**BIBLIOGRAPHY**

### **Text Book**

### Xavier, C, “Web Technology and Design” , New Age International Publishers.

* + **Reference Books**
* Ivan Bayross -Web Enabled Commercial Application Development Using HTML, DHTML, Java Script, Perl, CGI-2000.
* Patel and Barik, ”Introduction to Web Technology & Internet”, Acme Learning.
* Steve Suehring, Tim Converse, Joyce Park, "SERVLET/ JSP 6 and MySQL 6" WILLEY.

## Journals/Magazines/Govt. Reports/Gazatte/Industry Trends

## International Journal of Web Engineering and Technology:

## [https://www.inderscience.com/jhome.SERVLET/ JSP?jcode=ijwet](https://www.inderscience.com/jhome.php?jcode=ijwet)

## World Wide Web: Internet and Web Information Systems:

## <https://www.springer.com/journal/11280>

### **Webliography**

* W3schools: <https://www.w3schools.com/>
* <https://www.tutorialspoint.com/scripting_lnaguage_tutorials.htm>
  + **SWAYAM/NPTEL/MOOC Certification**
* NPTEL: NOC: Introduction to Modern Application Development, IIT Madras (https://nptel.ac.in/courses/106106156)
* Edx: Introduction to Web Development with HTML5, CSS3, and JavaScript (<https://www.edx.org/course/introduction-to-cloud-development-with-html5-css3-and-javascript>)

# PRACTICE PROBLEMS

Exercises in Java & JavaScript (Assignments) (Min 50 Problems\*)

|  |  |  |
| --- | --- | --- |
| **SNo** | **Problem** | **BTL** |
| 1 | Design a one page resume. | K6 |
| 2 | Create a user account creation form. | K6 |
| 3 | Design a webpage for department’s/school’s information including latest news window. | K6 |
| 4 | Design a webpage illustrating different concepts of hyperlinks in html including bookmarks. | K6 |
| 5 | Style different elements on a web page using inline styles. | K6 |
| 6 | Style different elements on a web page using internal CSS. | K6 |
| 7 | Style different elements on a web page linking external style sheets. | K6 |
| 8 | Illustrate the use of XML for sharing structured data over web. | K6 |
| 9 | Develop a mobile response web page for your school. | K6 |
| 10 | Design a web page to show image map. | K6 |
| 11 | Design your class time table to be display on browser. | K6 |
| 12 | Design a user login form and check if the password format is valid or not. | K6 |
| 13 | Develop a clickable button game using JavaScript. | K6 |
| 14 | Design a simple calculator using JavaScript. | K6 |
| 15 | Glow a bulb on clicking and vice versa it using Javascript. | K6 |
| 16 | Display text with shadow effect on a webpage. | K6 |
| 17 | Design a mobile responsive navigation bar. | K6 |
| 18 | Create a dynamic web page with user input using Java Server Pages script. | K6 |
| 19 | Create a webpage by fetching data from database using JSP. | K6 |
| 20 | Design a web page for uploading your resume and store it at a given location using SERVLET/ JSP/ JSP. | K6 |
| 21 | Create a web page for storing student’s record in a database. | K6 |
| 22 | Write a code to retrieve and display information of a registered student from database using SERVLET/ JSP. | K6 |
| 23 | Write a code to check the format of uploaded file using SERVLET/ JSP. | K6 |
| 24 | Write a code to create a cart for an ecommerce website | K6 |
| 25 | Illustrate how to manage sessions when login into a user account. | K6 |
| 26 | Illustrate how to manage cookies for a website. | K6 |
| 27 | Explain how the cookies are set and could be read using SERVLET/ JSP. | K6 |
| 28 | Create your own blog site. | K6 |
| 29 | Design an admin panel for managing records in a database. | K6 |
| 30 | Create a website to display album for your images. | K6 |
| 31 | Develop a user query form. | K6 |
| 32 | Write a code to encode the data input by the user, store it in the database and then decode the data back to retrieve actual information. | K6 |
| 33 | Write a code to generate captcha for authentication in a user login form. | K6 |
| 34 | Design a code to send a customized email using SERVLET/ JSP. | K6 |
| 35 | Generate mathematical tables from 11 to 99 on the webpage as per the user input | K6 |
| 36 | Build an appointment handler for fixing doctor’s appointment (using database in SERVLET/ JSP). | K6 |
| 37 | Write a code to display the data of students from database in sorted order. | K6 |
| 38 | Write a code to display any graphical image on a web page. | K6 |
| 39 | Design a parallax responsive webpage. | K6 |
| 40 | Write a program to check student grade based on the marks using if-else statement.  **Conditions:**   * If marks are 60% or more, grade will be First Division. * If marks between 45% to 59%, grade will be Second Division. * If marks between 33% to 44%, grade will be Third Division. * If marks are less than 33%, student will be Fail. | K3 |
| 41 | Write a program to show day of the week (for example: Monday) based on numbers using switch/case statements.  **Conditions:**   * You can pass 1 to 7 number in switch * Day 1 will be considered as Monday * If number is not between 1 to 7, show invalid number in default | K3 |
| 42 | Build a simple calculator in SERVLET/ JSP using switch case.  **Operations:**   * Addition * Subtraction * Multiplication * Division | K3 |
| 43 | How to check if an array is a subset of another in SERVLET/ JSP? | K1 |
| 44 | Change the image on button click using JavaScript. | K3 |
| 45 | Write a code to delete a record from database using SERVLET/ JSP. | K6 |

## STUDENT-CENTEREDLEARNING (SELF-LEARNING TOWARDS LIFE-LONG-LEARNING)

## COURSE-BASEDPROJECT (Psychomotor skills) (Min 45 Projects\*)

|  |  |  |
| --- | --- | --- |
| **SNo** | **Suggested Projects** | **BTL** |
| 1 | Develop a Chatbot for students | K3 |
| 2 | Build an Insurance / Loan EMI calculator | K3 |
| 3 | Build an Online CV generator. | K3 |
| 4 | Build a website for a restaurant. | K3 |
| 5 | Build a covid awareness web application. | K3 |
| 6 | Develop a word processor and word counter. | K3 |
| 7 | Build a media delivery service (streaming music or video) | K3 |
| 8 | Build an Online Notes Application | K3 |
| 9 | Build a mailing system to send a customized email to multiple recipients | K3 |
| 10 | Build an online photo album. | K3 |
| 11 | Develop a single page mobile responsive Resume | K6 |
| 12 | Develop a student result management system. | K6 |
| 13 | Build an e-commerce website. | K6 |
| 14 | Develop a search engine in SERVLET/ JSP | K6 |
| 15 | Develop an online examination and result management system. | K6 |
| 16 | Build an online book store | K6 |
| 17 | Develop a grievance management system for students. | K6 |
| 18 | Develop an Online library Management | K6 |
| 19 | Build an online Course registration system. | K6 |
| 20 | Develop a news portal in SERVLET/ JSP. | K6 |
| 21 | Build a Daily Expense Tracker System Using SERVLET/ JSP and MySQL | K6 |
| 22 | Build an online art gallery for the art lovers. | K6 |
| 23 | Develop a talent management system. | K6 |
| 24 | Build a small Customer Relationship Manager (CRM) | K6 |
| 25 | Develop a Tourism Management System. | K6 |
| 26 | Build a Directory Management System. | K6 |
| 27 | Build an IFSC Code Finder using SERVLET/ JSP | K6 |
| 28 | Build an online study center for students. | K6 |
| 29 | Develop an Attendance Monitoring System | K6 |
| 30 | Build a mobile responsive web application for an organization. | K6 |
| 31 | Develop a Health management system. | K6 |
| 32 | Build a blogs site. | K6 |
| 33 | Develop a Product Rating System as per the Consumer Reviews | K6 |
| 34 | Develop a web site for customized Movie Recommendation | K6 |
| 35 | Build an Online Voting System (that includes Login, Manage Administrators, Manage Candidates, Manage Positions, Check Poll Results, Update Password, Update Profile, Logout). | K6 |
| 36 | Build an Online Bakery Shop System | K6 |
| 37 | Design a Stock Management System. | K6 |
| 38 | Design a one page parallax responsive resume. | K6 |
| 39 | Develop an online quiz application. | K6 |
| 40 | Create a simple JavaScript quiz game. | K6 |
| 41 | Design a basic To-Do Webapp | K6 |
| 42 | Develop a contacts management system using SERVLET/ JSP. | K6 |
| 43 | Design a website for ticket booking system. | K6 |
| 44 | Design an online art gallery. | K6 |
| 45 | Develop a restaurant billing system. | K6 |

1. **SELF-LEARNINGTHROUGHMOOCs(CognitiveSkills):**Certification

Web Development Master Class & Certifications – by Udemy

(<https://www.udemy.com/course/become-a-certified-web-developer/>)

Web application development certification – by w3schools

(<https://courses.w3schools.com/browse/certifications/programs/web-app-development-certification>)