

UKA TARSADIA UNIVERSITY
B.C.A. (5th Semester) Syllabus, 2020-2021

Course Code: CS5003

Course Title: Fundamentals of Web Application Development

Course Credits: 04

[Lectures: 04, Tutorial: 00, Practical: 04]

Prerequisites: Web Designing and Developing, Database Management System

Prerequisites By Topics: Client-side and Server-side Programming Languages, HTTP Request and Response, Normalization, Responsive Web Design, Data Parsing

Objectives: To introduce concepts of dynamic web applications to design, develop and deploy such an application through the utilization of middleware technologies.

Course Outcomes: Upon completion of the course, students shall be able to

CO1:	Classify the nature of web applications with its configuration protocol.	Comprehend
CO2:	Describe the web container life cycle and client-server communication techniques for web applications.	Understanding
CO3:	Analyse the needs and usage of connection pooling in web data management, concept of debugging, and custom error handling.	Apply
CO4:	Implement authentication in web application using filter, role based, and session-based security.	Apply
CO5:	Demonstrate the usage of cross-platform scripting, mail transfer protocol and payment gateway.	Apply
CO6:	Construct and deploy web services to exchange semi-structured and unstructured data on various platforms.	Implement

Course Objective and Course Outcomes Mapping:

To introduce concepts of dynamic web applications to design, develop and deploy such an application: CO1, CO2, CO3, CO6
The utilization of middleware technologies.: CO5

Programme Outcomes: The student will have

- PO 1: Ability to understand the concepts of key areas in computer science.
- PO 2: Ability to design and develop system, component or process as well as test and maintain it so as to provide promising solutions to industry and society.
- PO 3: Effective communication and presentation skill.
- PO 4: Ability to understand professional and ethical responsibility.
- PO 5: Recognition of the need for life-long learning.

Programme Outcomes and Course Outcomes mapping:

Course Outcomes	Programme Outcomes				
	PO1	PO2	PO3	PO4	PO5
CO1	✓		✓		✓
CO2		✓			
CO3		✓			
CO4		✓	✓	✓	
CO5				✓	
CO6	✓		✓		✓

1 **Overview of Web Application Development and Configuration**

[13 %]

- 1.1. Types of Web application: E-commerce and M-commerce, Portal: Forum, Chat, Email, Search Engine and Community Building, Content Management System / Catalogue Websites, Media or Entertainment
- 1.2. Web Application Life Cycle

- 1.3. SOAP: Message Elements, Headers, Handling Fault
- 1.4. Web Configuration in Multi-tier architecture
- 2 **Building and Processing Web Forms** [17 %]
 - 2.1. Web Page Life cycle
 - 2.2. Request and Response: Classes, Methods
 - 2.3. Request Redirection and Forwarding
 - 2.4. Web Form Data: Validate, Access, Process and Display
- 3 **Data Storage, Retrieval and Error Handling** [20 %]
 - 3.1. Connection Pooling
 - 3.2. Database Connectivity
 - 3.3. Data Retrieval: Query, Stored Procedure
Report Generation: Dashboard and Analytics Report
 - 3.4. Error Handling and Debugging: Standard Errors, Custom Errors, Error page
- 4 **Web Application Security** [15 %]
 - 4.1. Web Application Security: Introduction, Needs, and Vulnerabilities
 - 4.2. Access Control and Authentication: Role based, Session based
 - 4.3. Request Filter: Request Intercepting
- 5 **Middleware Technologies** [15 %]
 - 5.1. Event based Asynchronous I/O Framework
 - 5.2. Cross-platform Runtime Environment: Overview, Page Construction
 - 5.3. Simple Mail Transfer Protocol: Need, Configuration, and Usage
 - 5.4. Payment Gateway: Need, Usage, Digital and Virtual Internet Payment Schemes, and Virtual Transaction Process
- 6 **Advanced Web services** [20 %]
 - 6.1. Web service: Types, Creation
 - 6.2. Data Exchange: Process, Operations
 - 6.3. File Upload
 - 6.4. Data Validation: Form Data
 - 6.5. Web Service Deployment: Build, Integrate and Consume

Course Units and Course Outcomes Mapping:

Unit No.	Unit	Course Outcomes					
		C01	C02	C03	C04	C05	C06
1	Overview of Web Application Development and Configuration	✓					
2	Building and Processing Web Forms		✓	✓			
3	Data storage, retrieval and Error Handling			✓			
4	Web Application Security		✓		✓		
5	Middleware Technologies			✓		✓	
6	Advanced Web services			✓	✓		✓

Computing Environment:

CE#1 : Servlet and JSP, ASP.Net with C# Programming Language, Netbeans IDE

CE#2 : MYSQL or PostgreSQL

CE#3 : Node.js

Text Books/Material References :

1. Marty Hall, Larry Brown - Core Servlets and Java Server Pages Volume – 1, Pearson Education
2. Matthew MacDonald - Pro ASP.NET 4 in C# 2010, Apress
3. <https://nodejs.org/en/docs/guides/>

Reference

1. Dave Mercer - ASP.NET – A Beginner's Guide – TMH
2. Luke Welling and Laura Thompson - PHP and MYSQL Web Development, Second edition – Sams Publishing
3. <https://docs.oracle.com/javaee/6/tutorial/doc/bnadu.html>
4. [https://docs.microsoft.com/en-us/previous-versions/msp-n-p/ff649096\(v=pandp.10\)?redirectedfrom=MSDN](https://docs.microsoft.com/en-us/previous-versions/msp-n-p/ff649096(v=pandp.10)?redirectedfrom=MSDN)

Course Curriculum Execution Guidelines

Semester Objectives: Following are the objectives determined to be achieved through teaching-learning, and assessment of the course

SO1: Enhance technical writing skill

SO2: Improve presentation skill

SO3: Promote contribution of students to share course related information

SO4: Develop system based problem solving skill

Content Delivery Mode:

1. Lecture method supplemented with audio-visual aids as well as chalk and talk shall be used for all units.
2. The course content shall be delivered by following the pattern, wherein teacher must give approximately 75% hours exclusively for imparting conceptual knowledge. Rest 25% hours for demonstration/hands-on regarding supported tool and technology.
3. Classroom Activity List: Following list of classroom activities may be included by a course teacher in the Lesson Plan. A course teacher may design her own classroom activities based on the nature of the course and batch and utilise the same for active learning.

Opening Questions, Take Home Assignments, Example sharing, Comprehensive Reading, If You Could Ask One Last Question—What Would it be? , Most Useful Point, Pre-requisite Task for next class, Note-Check, Think Pare Share, Brainstorm, Muddiest Point of the Class, Peer-Learning, Group Discussion, Presentation, Demonstration, Role Play, Quiz Down

Curriculum Enrichment Activity by the teacher: Pre-requisites and Extension Topics to be covered on working Saturdays. Pre-requisites must be covered through conceptual discussion along with demonstration using tool, hands-on exercise and practice examples based on the nature of the topic.

Activity Type	Topics	Activity	Objective	During
Bridge	Usage of middle ware technologies	Course of 2 hours	To fulfil concept related essentials	8th Week of Semester
Extension	Make aware of MVC Framework	Seminar/Expert Talk	To motivate students learning	10th Week of Semester

Activities/Practicum By Student: *The following activities shall be carried out by the students:*

1. Compare any two web application development technologies learn during course.
2. Identify any two web services those are not exist yet and you are going to provide it to society.
3. Choose one case study and prepare analysis report on web application security.

Practical Guidelines:

- A Course Teacher shall prepare a fresh Practical List for each academic year with no repeated problem definitions from the previous two consecutive years.
- The Practical List shall consist of “Required number of problems” for journal certification as well as “Practice problems” of varying nature from each unit as per its weightage and criticality.
- Laboratory Supervisor or Course Teacher shall sign in the journal only if he/she is satisfied by the work of a student.
- Journal shall be verified by the Laboratory Supervisor as well as by the Course Teacher at-least thrice in a semester at an appropriate interval upon the discretion of the Course Teacher.
- Journal must not be certified if the required number of problems are not included and not written clearly.
- After due approval, the Practical List shall be kept by concern Course Teacher on web site before the commencement of the semester.
- Problem list shall contain practical problems from each of the units are as follow:

Unit No.	Required no. of problems to get the journal certified	Covering Unit / Sub-Unit
2	2	All subunits
3	3	All subunits
4	2	All subunits
5	3	All subunits
6	2	All subunits
Total	12	

Assessment Parameters to evaluate Course Outcome and Semester Skills other than disseminated by Evaluation and Assessment Cell

1. *AP1: Technical Report Preparation*
2. *AP2: Create and deploy web service and use it on mobile applications made in course Fundamentals of Mobile Application Development.*
3. *AP3: Presentation and Assignment Submission*
4. *AP4: Peer review activity*

Semester Skill	Assessment Parameter (with description)			
	AP1	AP2	AP3	AP4
S01	✓			
S02	✓		✓	
S03				✓
S04		✓		