5 Years Integrated M.C.A.

CC12 Introduction to Server-side Programming (060060506)

5th Semester

EFFECTIVE FROM JUNE - 2017

VERSION-1.0
Course Code: 060060506  
Course Title: CC12 Introduction to Server-side Programming  
Course Credits: 4  
[Lectures: 04, Tutorial: 00, Practical: 04]

Prerequisites: Relational DBMS, Introduction to Web Development, Object Oriented Programming

Objectives: To provide awareness of data structures, threads and development of web based application using Server side technologies with session management.

1 Collections and Threads [20 %]
   1.1. Need of Collections
   1.2. List, Set and Map: Benefits over Array
   1.3. Thread Life cycle
   1.4. Main Thread
   1.5. Creating Threads: Single and Multiple
   1.6. Thread Priority and Deadlock

2 Architecture [10 %]
   2.1. Types of architecture
      2.1.1 Single tier, Two-tier and Three-tier
      2.1.2 Multi-tier : Overview
   2.2. Web Server
      2.2.1 Responsibilities
      2.2.2 Configuration files

3 HTTP Headers and Status Codes [20 %]
   3.1. Request and Response flow
   3.2. Request Headers: Content-Length, Referrer, User-Agent
   3.3. Response Headers: Content-Type, Expires, Refresh, Location
   3.4. Status codes: 100, 200, 202, 204, 302, 400, 404, 500
   3.5. Header information and Status code: Setting and Retrieval
   3.6. Request Redirection

4 Database Connectivity [15 %]
   4.1. Database connection and Configuration
   4.2. Data Retrieval: Classes and Methods
   4.3. SQL statement: Execution on web page

5 Session Management [15 %]
   5.1. Purpose
   5.2. URL Rewriting
   5.3. Cookies: creating, sending and receiving
   5.4. Session management API: Introduction, benefits over Cookies

6 Web Programming [20 %]
   6.1. Server side coding embedding in markup language
   6.2. Comment, Expression and Expression language
   6.3. Declaration
   6.4. Directives

The technology as an exposure to the concepts’ implementation shall be determined by the course teacher(s) with due approval of Director and/or IQAC.

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

CO1: Develop multithreaded applications and demonstrate the usage of Collection class.
CO2: Recognize the usage of Single tier, Two tier, Three tier and Multi-tier architecture to
develop web application.

CO3: Develop web application using HTTP Request and Response headers.

CO4: Illustrate the usage of database connectivity to access data from MySQL database.

CO5: Demonstrate and use session tracking for a web application.

CO6: Use directives, scripting elements and expression language.

Course Objective and Course Outcomes Mapping:

To provide awareness of data structures and threads: CO1
To provide awareness of development of web based application using server side technologies: CO2, CO3, CO4, CO6
To provide awareness of using server side technologies with session management: CO4, CO5, CO6

Course Units and Course Outcomes Mapping:

<table>
<thead>
<tr>
<th>Unit No.</th>
<th>Unit</th>
<th>Course outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>C01</td>
</tr>
<tr>
<td>1</td>
<td>Collections and Thread</td>
<td>✓</td>
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<tr>
<td>2</td>
<td>Architecture</td>
<td></td>
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<tr>
<td>3</td>
<td>HTTP headers and Status codes</td>
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<td>4</td>
<td>Database Connectivity</td>
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<td>5</td>
<td>Session Management</td>
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<tr>
<td>6</td>
<td>Web Programming</td>
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</tbody>
</table>

Laboratory:

- A Course Teacher shall prepare a fresh Practical List for each academic year with no repeated problem definitions from previous two consecutive years.
- The Practical List shall consists 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 student.
- Journal shall be verified by the Laboratory Supervisor as well as by the Course Teacher at-least thrice in a semester at appropriate interval upon the discretion of the Course Teacher.
- Journal must not be certified if 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:

<table>
<thead>
<tr>
<th>Unit No.</th>
<th>Required no. of problems to get the journal certified</th>
<th>Covering Unit / Sub-Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td>All sub-units</td>
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<tr>
<td>3</td>
<td>4</td>
<td>All sub-units</td>
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<tr>
<td>4</td>
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<td>5</td>
<td>3</td>
<td>All sub-units</td>
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<tr>
<td>6</td>
<td>4</td>
<td>All sub-units</td>
</tr>
<tr>
<td>Total</td>
<td>18</td>
<td></td>
</tr>
</tbody>
</table>
Hands-on Activity

- Hands-on sessions shall be conducted on following topics:
  - Internationalization: Support for Hindi language for data validation.

Modes of Transaction (Delivery):

- Lecture method shall be used for all units. For all units lecture delivery shall be supplemented with audio-visual aids.
- Demonstration shall be given for topics of unit 1, 4, 5, and 6
- Self-Study of following part of the syllabus shall be done by the students:
  - Status codes: 100, 204, 302, 404

Activities/Practicum:

The following activities shall be carried out by the students.

- Demonstrate the installation of an IDE for server-side application development.
- Demonstrate the creation of stored procedure in any two prevalent databases.

The following activities shall be carried out by the course teacher.

- Demonstrate SQL injection over self-developed web page and further demonstrate the usage of stored procedure.

Text Books:

1. Uttam K. Roy, Advanced Java Programming, OXFORD
2. HTTP Header Request and Response:
   - [http://docs.oracle.com/javaee/6/api/javax/servlet/http/HttpServletRequest.html](http://docs.oracle.com/javaee/6/api/javax/servlet/http/HttpServletRequest.html)
   - [https://docs.oracle.com/javaee/6/api/javax/servlet/http/HttpServletResponse.html](https://docs.oracle.com/javaee/6/api/javax/servlet/http/HttpServletResponse.html)

Reference Books:

2. Hall, M., Brown, L. - Core Servlets and Java Server Pages Volume – 1 - Pearson Education
3. Matthew MacDonald, "Beginning ASP.NET in C#", APress

Concept Map:

It is a hierarchical / tree based representation of all topics covered under the course. This gives direct / indirect relationship / association among topics as well as subtopics.
Unit 1: Collections and Threads

- Discusses
  - Thread life cycle model
  - Main Thread
  - Collection Framework
    - Includes
      - HashSet, LinkedList
      - HashMap, LinkedHashSet
      - ArrayList, LinkedList

- Demonstrates
  - Collections and Multithreaded Programming
  - Deadlock in Thread
  - Creating Threads: Single Thread and Multiple Thread
  - Main Thread
  - Thread Priority
Unit 2: Architecture

Unit 3: HTTP Headers and Status Codes

Unit 4: Database Connectivity
Unit 5: Session Management

Session Management

- Demonstrates Manage: creating, sending and receiving cookie
- Discusses Cookie Attributes:
  - Name
  - Comment
  - Path
  - MaxAge

- Demonstrates Session Tracking, Need for Session Tracking, Session Tracking API
- Discusses Differentiating Session Cookies from Persistent Cookies

Unit 6: Web Programming
Assessment:

- The weightage of Continuous Internal Evaluation (CIE) and University examination shall be as per the University regulations.
- The course teacher is free to decide the structure of CIE:
  1. Assessment parameters like Open Book test, Quizzes, Unit Tests, Assignments, Internal, Self-Creation and etc.
  2. Weightage and frequency of each parameter.
- After assessment parameters are approved by Director and/or IQAC, it shall be informed to the students by publishing over web before commencement of the semester.
- The assessment policy document should be uploaded on the web before the commencement of the semester.
- Syllabus for each CIE parameter shall be covered by the date of the corresponding test.
- No make-up work shall be conducted unless approval from Director.
- The weightage of Continuous Internal Evaluation (CIE) and University examination shall be as per the University regulations.

UFM:

- Any ascertained fact of breaking institute policy shall be associated with one or all of the following: (i) zero marks for the work; (ii) report to the programme coordinator; (iii) report to the Director.

Attendance:

- Attendance means being present for the entire class session. Those arriving significant late or leaving significantly early without prior permission shall be counted as ABSENT for the entire class session.
- Concern teacher must clearly state his/her attendance policies at the first class meeting.