Effective Term
Semester A 2022/23

Part I Course Overview

Course Title
Advanced Internet Applications Development

Subject Code
CS - Computer Science

Course Number
4280

Academic Unit
Computer Science (CS)

College/School
College of Engineering (EG)

Course Duration
One Semester

Credit Units
3

Level
B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
CS2204 Fundamentals of Internet Applications Development
OR
(CS1303 Introduction to Internet and Programming and
CS2313 Computer Programming)

Precursors
CS2303 Data Structures for Media or
CS3201 Computer Networks

Equivalent Courses
Nil

Exclusive Courses
Nil
## Part II Course Details

### Abstract
This course aims at providing an advanced study of designing and building Internet applications, with emphasis on the server-side architecture. Students should be able to set up enterprise-scale web-based services and develop application programs to support such services. Comparative study of different server-side technologies will also be included.

### Course Intended Learning Outcomes (CILOs)

<table>
<thead>
<tr>
<th>CILOs</th>
<th>Weighting (if applicable)</th>
<th>DEC-A1</th>
<th>DEC-A2</th>
<th>DEC-A3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Explore the fundamental concepts and procedures of major server-side Internet application architectures and services.</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Build web sites that involve server-side processing.</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
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<tr>
<td>3. Write server-side processing scripts.</td>
<td></td>
<td></td>
<td>x</td>
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</tr>
<tr>
<td>4. Design advanced web-based application systems with state-of-the-art techniques using selected models and frameworks.</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>5. Explore other advanced techniques of web servers, including security and cluster architecture.</td>
<td></td>
<td>x</td>
<td></td>
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</tbody>
</table>

**A1: Attitude**
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

**A2: Ability**
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

**A3: Accomplishments**
Demonstrate accomplishment of discovery/innovation/creativity through producing/constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

### Teaching and Learning Activities (TLAs)

<table>
<thead>
<tr>
<th>TLAs</th>
<th>Brief Description</th>
<th>CILO No.</th>
<th>Hours/week (if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lecture</td>
<td>Explore the fundamental concepts.</td>
<td>1, 2</td>
<td>3 hours/week</td>
</tr>
<tr>
<td>2. Tutorial sessions</td>
<td>Instructor led and self-paced laboratory exercises.</td>
<td>1, 2, 3, 4</td>
<td>8 hours/semester</td>
</tr>
<tr>
<td>3. Coursework</td>
<td>Problem based learning (PBL) activities in the form of projects with a substantial scope.</td>
<td>4, 5</td>
<td></td>
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</tbody>
</table>
Assessment Tasks / Activities (ATs)

<table>
<thead>
<tr>
<th>ATs</th>
<th>CILO No.</th>
<th>Weighting (%)</th>
<th>Remarks (e.g. Parameter for GenAI use)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Assignment</td>
<td>1, 2</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>Quiz</td>
<td>1, 2, 4, 5</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>Projects</td>
<td>3, 4, 5</td>
<td>20</td>
</tr>
</tbody>
</table>

Continuous Assessment (%)
50

Examination (%)
50

Examination Duration (Hours)
2

Additional Information for ATs
For a student to pass the course, at least 30% of the maximum mark for the examination must be obtained.

Assessment Rubrics (AR)

Assessment Task
Laboratory exercises conducted in tutorials

Criterion
Ability to applied to introduced concepts

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Assessment Task
Examination

Criterion
Ability to explain the topics learned

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant
Fair (C+, C, C-)
Moderate
Marginal (D)
Basic
Failure (F)
Not even reaching marginal levels

Assessment Task
Coursework
Criterion
Ability to applied the introduced concepts
Excellent (A+, A, A-)
High
Good (B+, B, B-)
Significant
Fair (C+, C, C-)
Moderate
Marginal (D)
Basic
Failure (F)
Not even reaching marginal levels

Part III Other Information
Keyword Syllabus
Review of web server architecture and technologies. Multi-tier applications, full stack development, LAMP, .NET, Java EE & MEAN. Server-side programming models, CGI, selected server platform, template engines; Model View Controller. Security and scalability in web applications, session control, SSL, reverse proxy and server clusters.

Syllabus
• Review of web server architecture and technologies
• Server-side programming
  Study of a selected Server side scripting technology. Template engines.
• Web systems design
  Model View Controller. Design pattern and implementation. RESTful API.
• Security aspects
• Multi-server web systems
  Performance and scalability. Server clusters.

Reading List
## Compulsory Readings

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<tr>
<th>Title</th>
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## Additional Readings

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