## Course Overview

**Course Title:** Advanced Internet Applications Development  
**Course Code:** CS4280  
**Course Duration:** One semester  
**Credit Units:** 3 credits  
**Level:** B4  
**Proposed Area:**  
- [ ] Arts and Humanities  
- [ ] Study of Societies, Social and Business Organisations  
- [ ] Science and Technology  
**Medium of Instruction:** English  
**Medium of Assessment:** English  
  - CS2204 Fundamentals of Internet Applications Development  
  - OR  
    - (CS1103 Introduction to Media Computing  
      and CS1303 Introduction to Internet and Programming  
      and CS2313 Computer Programming)  
**Prerequisites:**  
(Course Code and Title)  
- CS2303 Data Structures for Media or  
- CS3201 Computer Networks or  
- CS3270 Fundamentals of Computer Networks and the Internet  
**Precursors:**  
(Course Code and Title)  
**Equivalent Courses:**  
(Course Code and Title) Nil  
**Exclusive Courses:**  
(Course Code and Title) Nil
Part II Course Details

1. Abstract
   *(A 150-word description about the course)*

   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.

2. Course Intended Learning Outcomes (CILOs)
   *(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)*

<table>
<thead>
<tr>
<th>No.</th>
<th>CILOs*</th>
<th>Weighting* (if applicable)</th>
<th>Discovery-enriched curriculum related learning outcomes (please tick where appropriate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Explore the fundamental concepts and procedures of major server-side Internet application architectures and services.</td>
<td>✓</td>
<td>A1 A2 A3</td>
</tr>
<tr>
<td>2.</td>
<td>Build web sites that involve server-side processing.</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Write server-side processing scripts.</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Design advanced web-based application systems with state-of-the-art techniques using selected models and frameworks.</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Explore other advanced techniques of web servers, including security and cluster architecture.</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

* If weighting is assigned to CILOs, they should add up to 100%.

# Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

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 self-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.*
3. **Teaching and Learning Activities (TLAs)**  
* (TLAs designed to facilitate students' achievement of the CILOs.)

Teaching pattern:  
*Suggested lecture/tutorial/laboratory mix: 2 hrs. lecture; 1 hr. tutorial.*

<table>
<thead>
<tr>
<th>TLA</th>
<th>Brief Description</th>
<th>CILO No.</th>
<th>Hours/week (if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>Explore the fundamental concepts.</td>
<td>✓</td>
<td>2hrs/week</td>
</tr>
<tr>
<td>Tutorial sessions</td>
<td>Instructor led and self-paced laboratory exercises.</td>
<td>✓ ✓ ✓ ✓ ✓</td>
<td>1hrs/week</td>
</tr>
<tr>
<td>Coursework</td>
<td>Problem based learning (PBL) activities in the form of projects with a substantial scope.</td>
<td>✓ ✓</td>
<td></td>
</tr>
</tbody>
</table>

4. **Assessment Tasks/Activities (ATs)**  
* (ATs are designed to assess how well the students achieve the CILOs.)

<table>
<thead>
<tr>
<th>Assessment Tasks/Activities</th>
<th>CILO No.</th>
<th>Weighting*</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous Assessment: 50%</td>
<td></td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Assignment</td>
<td>✓ ✓ ✓</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Quiz</td>
<td>✓ ✓ ✓ ✓ ✓</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>Projects</td>
<td>✓ ✓ ✓ ✓</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>Examination*: 50% (duration: 2 hours)</td>
<td></td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

* The weightings should add up to 100%.

* For a student to pass the course, at least 30% of the maximum mark for the examination must be obtained.
5. **Assessment Rubrics**

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

<table>
<thead>
<tr>
<th>Assessment Task</th>
<th>Criterion</th>
<th>Excellent (A+, A, A-)</th>
<th>Good (B+, B, B-)</th>
<th>Fair (C+, C, C-)</th>
<th>Marginal (D)</th>
<th>Failure (F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Laboratory exercises conducted in tutorials</td>
<td>Ability to applied to introduced concepts</td>
<td>High</td>
<td>Significant</td>
<td>Moderate</td>
<td>Basic</td>
<td>Not even reaching marginal levels</td>
</tr>
<tr>
<td>2. Examination</td>
<td>Ability to explain the topics learned</td>
<td>High</td>
<td>Significant</td>
<td>Moderate</td>
<td>Basic</td>
<td>Not even reaching marginal levels</td>
</tr>
<tr>
<td>3. Coursework</td>
<td>Ability to applied the introduced concepts</td>
<td>High</td>
<td>Significant</td>
<td>Moderate</td>
<td>Basic</td>
<td>Not even reaching marginal levels</td>
</tr>
</tbody>
</table>
Part III  Other Information (more details can be provided separately in the teaching plan)

1. **Keyword Syllabus**  
   *(An indication of the key topics of the course.)*

   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**

   1. Review of web server architecture and technologies  

   2. Server-side programming  
      Study of a selected Server side scripting technology. Template engines.

   3. Web systems design  
      Model View Controller. Design pattern and implementation. RESTful API.

   4. Security aspects  

   5. Multi-server web systems  
      Performance and scalability. Server clusters.

2. **Reading List**

2.1 **Compulsory Readings**  
*(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)*


2.2 **Additional Readings**  
*(Additional references for students to learn to expand their knowledge about the subject.)*