CS3347: SOFTWARE ENGINEERING PRINCIPLES AND PRACTICE

Effective Term
Semester A 2022/23

Part I Course Overview

Course Title
Software Engineering Principles and Practice

Subject Code
CS - Computer Science

Course Number
3347

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
CS2313 Computer Programming or equivalent

Precursors
Nil

Equivalent Courses
Nil

Exclusive Courses
Nil
Part II Course Details

Abstract
This course aims to introduce the fundamental principles, methods and practice of team-based software development, with a key focus on the object-oriented analysis and design methodology. Students will appreciate key activities in the development of software applications, including project management, requirements specification and design. Students are prepared to participate in a software development team and to optionally pursue further studies in advanced topics in software engineering.

Course Intended Learning Outcomes (CILOs)

<table>
<thead>
<tr>
<th>CILOs</th>
<th>Weighting (if app.)</th>
<th>DEC-A1</th>
<th>DEC-A2</th>
<th>DEC-A3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Describe the major software development processes and explain their relative merits and limitations.</td>
<td></td>
<td>x</td>
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<tr>
<td>2. Describe software project management techniques within a team environment.</td>
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<td></td>
<td>x</td>
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<tr>
<td>3. Specify software requirements and conduct object-oriented modelling, analysis and design of software systems.</td>
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<td>x</td>
<td>x</td>
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<tr>
<td>4. Apply software engineering techniques to appreciate the professional practice of developing quality software.</td>
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<td>x</td>
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<td>x</td>
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</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>
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<tbody>
<tr>
<td>1</td>
<td>Lecture&lt;br&gt;Introduce the fundamental principles and practices of software engineering methodologies utilizing examples of real-life software development and case studies.</td>
<td>1, 2, 3, 4</td>
<td>3 hours/week</td>
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<td></td>
<td>ATs</td>
<td>CILO No.</td>
<td>Weighting (%)</td>
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<tr>
<td>---</td>
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</tr>
<tr>
<td>1</td>
<td>Group project</td>
<td>3, 4</td>
<td>40</td>
</tr>
<tr>
<td>2</td>
<td>Test</td>
<td>3</td>
<td>10</td>
</tr>
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**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**
Group project

**Criterion**
Ability to identify actors and use cases, and draw the use case diagram with relationships among use cases with descriptions.

**Excellent (A+, A, A-)**
High

**Good (B+, B, B-)**
Significant

**Fair (C+, C, C-)**
Moderate

**Marginal (D)**
Basic
Failure (F)
Below marginal level

Assessment Task
Group project

Criterion
Ability to identify entity classes with reasonable details, and correct class associations shown in the class diagram, with class description.

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Below marginal level

Assessment Task
Group project

Criterion
Ability to identify all necessary boundary classes and control classes consistent with the use case scenarios.

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Below marginal level

Assessment Task
Group project
Criterion
Ability to draw sequence diagrams showing the object-object interactions for the use cases matching the corresponding use case scenario description; and eventually adding details to the previous class diagrams.

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Below marginal level

Assessment Task
Group project

Criterion
Ability to rewrite the user requirements descriptions with clear elaboration on the assumptions made during the design process.

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Below marginal level

Assessment Task
Group project

Criterion
Ability to present all design outputs in the user requirement specification which contains 1/ use case modelling with descriptions, 2/ all categories of classes with descriptions, 3/ sequence diagrams matching use cases, 4/ one state chart diagram.

Excellent (A+, A, A-)
High
Assessment Task
Group project

Criterion
Ability to organize the specification nicely with minimum ambiguities.

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Below marginal level

Assessment Task
Test

Criterion
Ability to apply appropriate techniques to model simple user requirements.

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Below marginal level
Assessment Task
Examination

Criterion
Ability to achieve the respective CILOs.

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Below marginal level

Part III Other Information

Keyword Syllabus

Reading List

Compulsory Readings

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Additional Readings

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