

CAMBODIA ACADEMY OF DIGITAL TECHNOLOGY
INSTITUTE OF DIGITAL TECHNOLOGY
 School of Digital Engineering

| Course Information | | | |
|------------------------|--|---------------|-----------------------------|
| Course Title | Software Engineering | | |
| Department | Computer Science | | |
| Course Code | | Hour: 45 | Credit: 3 |
| Level | Bachelor | Prerequisite | OOP |
| Course Type | Major <input type="checkbox"/> Core <input checked="" type="checkbox"/> Elective <input type="checkbox"/> Other <input type="checkbox"/> | | |
| Offer in Academic Year | Year 2, Term 3 | | |
| Revision | Version 1.3, 10/April/2024 | | |
| Instructor Information | | | |
| Instructor | SIM Sisavuthary | Qualification | Master |
| Mobile | 093 99 77 78 | Email | sisavuthary.sim@cadt.edu.kh |
| Telegram | @simsisavuthary | | |
| Office Hour | Tuesday: 10h:15-11h:45 Friday: 08h:30-10h:00, 10h:15-11h:45, 13h:00-14h:30, 14h:45-16h:15 | | |

Course Description

This course provides a general introduction to Software Engineering. There are important concepts such as software processes and agile methods, and describe essential software development activities, from initial software specification through to system evolution. This course has been designed to support a one-semester course in software engineering. By the end

of the course, students will be able to understand the process of development software as a team and learn about Unified Modeling Language (UML) which allowed them to draw various diagrams in the process of creating program.

Course Learning Outcomes

- Understand why different types of models are required and the fundamental system modeling perspectives of context, interaction, structure and behavior.

By the end of the course, learners should gain the following *knowledge*:

- CLO1: Understand what software engineering is and why it is important.
- CLO2: Understand different types of software development life cycle and software engineering techniques.
- CLO3: Understand the concepts of software processes and software process models.
- CLO4: Understand the concepts of Unified Modeling Languages (UML) and its usage.
- CLO5: Understand the user requirements and the application of UML diagrams.

By the end of the course, learners should be able to use the following *skills*:

- CLO6: Demonstrate ability to analyze the software requirements.
- CLO7: Demonstrate ability to use proper methodology to manage software projects.
- CLO8: Demonstrate ability to use proper UML diagrams to model the software requirements.
- CLO9: Demonstrate ability to present software analysis in a professional way.

By the end of the course, learners should develop the following *attitudes*:

- CLO10: Demonstrate ability to identify problem in society that could be solved by using digital technology, and to take responsibility for developing this knowledge.
- CLO11: Demonstrate understanding of the opportunities and limitations of science and its role in society and the responsibility for how it is used.

Learning Level

| Course Learning Outcomes | | Bloom Taxonomy | | | | | |
|--------------------------|-------|---------------------|-----------------------|---------|--------------|---------------------|--------|
| KS | CLOs | Remember | Understand | Apply | Analyze | Evaluate | Create |
| Knowledge | CLO1 | | ✓ | | | | |
| | CLO2 | | ✓ | ✓ | ✓ | | ✓ |
| | CLO3 | | ✓ | | | | |
| | CLO4 | | ✓ | ✓ | ✓ | | ✓ |
| | CLO5 | | ✓ | ✓ | ✓ | | |
| Skill | CLO6 | | ✓ | ✓ | ✓ | | ✓ |
| | CLO7 | | | | ✓ | | |
| | CLO8 | | ✓ | ✓ | ✓ | | ✓ |
| | CLO9 | | ✓ | | | | |
| Attitude | CLOs | Receiving Phenomena | Responds to Phenomena | Valuing | Organization | Internalizes Values | |
| Attitude | CLO10 | ✓ | ✓ | ✓ | | | |
| | CLO11 | | | ✓ | | | |

Course Outline/Schedule

RL: P: BL: SDL denotes *Recap Lecture hours, Practical hours, Blended Learning hours, Self-directed learning hours* respectively

| Session | Topic | Contact Hours | | | | Required Reading | Homework/ Lab/ Assignments |
|---------|---|---------------|---|----|-----|---------------------|----------------------------|
| | | RL | P | BL | SDL | | |
| 1 | Introduction to Software Engineering | 1 | 0 | 1 | 1 | Read Book Lesson 01 | Discussion #1 |
| 2 | Introduction to UML UML – Use Case Diagram | 1 | 2 | 0 | 0 | Read Book Lesson 05 | Lab #1 |
| 3 | Software Processes | 1 | 0 | 1 | 1 | Read Book Lesson 02 | Discussion #2 |

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| 4 | UML – Activity Diagram | 1 | 2 | 0 | 0 | Read Book Lesson 05 | Lab #2 |
| 5 | Agile Software Development | 1 | 0 | 1 | 1 | Read Book Lesson 03 | Discussion #3 |
| 6 | UML – Class Diagram | 1 | 2 | 0 | 0 | Read Book Lesson 05 | Lab #3 |
| 7 | Requirement Engineering | 1 | 0 | 1 | 1 | Read Book Lesson 04 | Discussion #4 |
| 8 | UML – Sequence Diagram | 1 | 2 | 0 | 0 | Read Book Lesson 05 | Lab #4 |
| 9 | System Modelling | 1 | 0 | 1 | 1 | Read Book Lesson 05 | Discussion #5 |
| 10 | Student’s Presentation | 0 | 3 | 0 | 0 | Presentation Guideline | Presentation |
| 11 | <i>Final Exam</i> | | | | | | |

Learning Resource:

- **Core Textbook**
 - Software Engineering, Ian Sommerville, Pearson 9th Edition, 2010
- **Tool**
 - lucidchart
 - <https://www.lucidchart.com/pages>
- **Additional Reading Materials**
 - UML 2 For Dummies 1st Edition, [Michael Jesse Chonoles](#) (Author), [James A. Schardt](#) (Author)

Student Responsibilities

- Students are required to attend the class regularly and punctually. Any student who misses more than 4 weeks (with or without permission), shall be marked with W grade as an automatic withdrawal from the course.
- Students must read each lesson before each session (ex. Lesson 1 for session 1)
- Plagiarism and cheating are NOT allowed.
- Class participation is a must.

Academic Policy: (Assessment Policy, Plagiarism, and Cheating Policy....)

- **Attendance:** must attend the class
- **Class participation:** must discuss with group
- **Assignment:** must submit the assignments
- **Presentation:** must be presentation on a related topic
- **Final Exam:** must come to take the exam
- **Penalty:** reduce scores based on absent for each session

Grading Policy

| <i>Activities</i> | <i>Percentage (%)</i> |
|------------------------------|-----------------------|
| Attendance | 10% |
| Labs and Class Participation | 30% |
| Assignments | 20% |
| Presentation | 20% |
| Final exam | 20% |

- **Attendance**
 - Students must come to the class every session. If they skip each session, they will lose the mark for that session.
- **Labs and Class participation**
 - Students must come to class and are assigned to groups to answer the questions and do the lab practice. If they skip each session, they will lose the mark for that session.
 - Proactivity and teamwork are encouraged.
- **Assignments**
 - Students must submit their assignment before the deadlines. If they don't submit the assignment, they will lose the mark for that assignment.
- **Presentation**
 - Students are assigned to work as a team to create and present their project. Those who are absent on the day of the presentation will lose the marks for presentation.
 - Students should take ownership, be responsible, and demonstrate teamwork.
- **Final exam**
 - Students must come to class to take the final exam. If they are absent on the final exam date, they will automatically get 0 mark.

Rating Scale

| Letter Grade | Grade Point | Score | Explanation |
|--------------|-------------|--------|-------------|
| A | 4.00 | 85-100 | Excellent |
| B+ | 3.50 | 80-84 | Very Good |
| B | 70-79 | 3.0 | Good |
| C+ | 65-69 | 2.5 | Fairly Good |
| C | 50-60 | 2.0 | Fair |
| F | <50 | 0.0 | Fail |

1. STUDENT LEARNING EXPERIENCE ACTION PLANNING

* Sample are available in the annex below

| Week | Contents/Topics | Intended Learning outcomes | Teaching Approach | Delivery modes | Teaching-Learning Activities | Assessment Strategy and methods | Student Behaviours (Think-feel-do) |
|------|---|---|---|--|--|--|--|
| | | Describe what the student should be able to know (Think), do, behave, demonstrate (do), and feel, reflect (feel) in terms of a particular discipline, knowledge, skill and attitude at the end of the learning experience | Appropriate teaching-learning approach or combination of approaches-used to help students to learn and achieve the intended learning outcomes | Relevant delivery mode or combination of delivery modes that best support the main teaching approach | Describe the specific teaching-learning activities you plan to deploy to better engage students in active learning | <ul style="list-style-type: none"> Formative and/or summative assessments Individual or group Assessment types and weightage | How do you hope this learning experience will impact your students' feeling, thinking, and doing – individually and as a group? |
| 1 | Introduction to Software Engineering | <ul style="list-style-type: none"> Understand the concept of software engineering and know why it is important | Discussion Inquiry-based learning Give comments and feedbacks | Blended of Lecture Short Lecture Group Discussion Sharing Answers Feedbacks | Group discussion Plan and prepare for answers Answer questions | Individual/Peer/Group assignments | Teamwork and Collaboration: Experience collaboration and effective teamwork Open-minded: Answer the questions by own understanding Synthesis: describe and explain on what your finding |
| 2 | Introduction to UML UML – Use Case Diagram | <ul style="list-style-type: none"> Understand the concept and the usage of UML in software development Demonstrate the usage of use case diagram Do the lab | | Blended of Lecture Short Lecture Group Discussion | Group discussion Plan and prepare for answers Answer questions | Individual/Peer/Group assignments | Teamwork and Collaboration: Experience collaboration and effective teamwork |

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| | | | | Sharing Answers Feedbacks | | | Open-minded: Answer the questions by own understanding Synthesis: describe and explain on what your finding |
| 3 | Software Processes | <ul style="list-style-type: none"> Understand the concepts of software processes and software process models | | Blended of Lecture Short Lecture Group Discussion Sharing Answers Feedbacks | Group discussion Plan and prepare for answers Answer questions | Individual/Peer/Group assignments | Teamwork and Collaboration: Experience collaboration and effective teamwork Open-minded: Answer the questions by own understanding Synthesis: describe and explain on what your finding |
| 4 | UML – Activity Diagram | <ul style="list-style-type: none"> Demonstrate the usage of activity diagram Do the lab | | Blended of Lecture Short Lecture Group Discussion Sharing Answers Feedbacks | Group discussion Plan and prepare for answers Answer questions | Individual/Peer/Group assignments | Teamwork and Collaboration: Experience collaboration and effective teamwork Open-minded: Answer the questions by own understanding Synthesis: describe and explain on what your finding |
| 5 | Agile Software Development | <ul style="list-style-type: none"> Understand different types of software development life cycle and software engineering techniques | | Blended of Lecture Short Lecture Group Discussion Sharing Answers | Group discussion Plan and prepare for answers Answer questions | Individual/Peer/Group assignments | Teamwork and Collaboration: Experience collaboration and effective teamwork |

| | | | | | | | |
|---|-------------------------|---|--|---|--|-----------------------------------|---|
| | | | | Feedbacks | | | <p>Open-minded: Answer the questions by own understanding</p> <p>Synthesis: describe and explain on what your finding</p> |
| 6 | UML – Class Diagram | <ul style="list-style-type: none"> ▪ Demonstrate the usage of class diagram ▪ Do the lab | | Blended of Lecture Short Lecture Group Discussion Sharing Answers Feedbacks | Group discussion Plan and prepare for answers Answer questions | Individual/Peer/Group assignments | <p>Teamwork and Collaboration: Experience collaboration and effective teamwork</p> <p>Open-minded: Answer the questions by own understanding</p> <p>Synthesis: describe and explain on what your finding</p> |
| 7 | Requirement Engineering | <ul style="list-style-type: none"> ▪ Understand different types of software requirements and the analysis techniques | | Blended of Lecture Short Lecture Group Discussion Sharing Answers Feedbacks | Group discussion Plan and prepare for answers Answer questions | Individual/Peer/Group assignments | <p>Teamwork and Collaboration: Experience collaboration and effective teamwork</p> <p>Open-minded: Answer the questions by own understanding</p> <p>Synthesis: describe and explain on what your finding</p> |
| 8 | UML – Sequence Diagram | <ul style="list-style-type: none"> ▪ Demonstrate the usage of sequence diagram ▪ Do the lab | | Blended of Lecture Short Lecture Group Discussion Sharing Answers | Group discussion Plan and prepare for answers Answer questions | Individual/Peer/Group assignments | <p>Teamwork and Collaboration: Experience collaboration and effective teamwork</p> |

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|----|--------------------|--|--|-------------------|--------------------------|-------------------|---|
| | | | | Feedbacks | | | <p>Open-minded: Answer the questions by own understanding</p> <p>Synthesis: describe and explain on what your finding</p> |
| 9 | System Modeling | <ul style="list-style-type: none"> Understand the concept of system modelling and the importance of modelling in software development | | Sharing Knowledge | Listen and ask questions | Oral presentation | <p>Teamwork and Collaboration: Experience collaboration and effective teamwork</p> <p>Open-minded: Answer the questions by own understanding</p> <p>Synthesis: describe and explain on what your finding</p> |
| 10 | Group Presentation | <ul style="list-style-type: none"> Present group project | | Sharing Knowledge | Listen and ask questions | Oral presentation | <p>Synthesis: present group project</p> <p>Soft skill: Presentation and Communication</p> |
| 11 | Final Exam Week | | | | | | |