



Course Title: Software Engineering

Course Code EGCI 341

Undergraduate Program

Mahidol University International College

Division Science

TQF 3 Course Specifications

Section 1 General Information

1. Course code and course title

Thai EGCI 341 วิศวกรรมซอฟต์แวร์

English EGCI 341 Software Engineering

2. Number of credits 4(4-0-8) (Lecture/Lab/Self-study)

3. Program and type of subject

3.1 Program Bachelor of Engineering (Computer Engineering)

3.2 Type of Subject Required course

4. Course Coordinator and Course Lecturer

4.1 Course Coordinator Asst. Prof. Dr. Lalita Narupiyakul

4.2 Course Lecturer Asst. Prof. Dr. Lalita Narupiyakul

5. Trimester/ Year of Study

5.1 Trimester First trimester / for 3rd year Computer Engineering

5.2 Course Capacity Approximately 30 students

6. Pre-requisite EGCI321

7. Co-requisites None

8. Venue of Study Mahidol University, Salaya campus



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Section 2 Goals and Objectives

1. Course Goals

Students can explain software life-cycle. Software requirements and define the constraints can be analyzed and reported in the form of IEEE software requirement specification. Student can design a basic software system and define the software components based on the software architectures. The basis of software development and software testing can be implemented of the real-world software to assure the quality of software project. The fundamental of software project planning and software cost estimation must be used to solve the software project. Problem.

2. Objectives of Course Development/Revision

2.1 Course Objectives

1. Explain the software life-cycle.
2. Analyze the software requirement.
3. Design the software to solve engineering problem.
4. Estimate the software cost and project budget based on real-world application.

2.2 Course-level Learning Outcomes: CLOs

By the end of the course, students will be able to (CLOs)

1. CLO1 Identify the constraints on software design problem and provide the solution that corresponding to software requirements.
2. CLO2 Design the software system and plan a software project to solve engineering problem.
3. CLO3 Perform software test and construct software test report.



Section 3 Course Management

1. Course Description

(Thai) วัฏจักรชีวิตของซอฟต์แวร์ ความต้องการและข้อกำหนด การพัฒนาซอฟต์แวร์ขนาดใหญ่ การจัดกำหนดการ การพัฒนา การสร้าง การทดสอบ และการบำรุงรักษาระบบซอฟต์แวร์ การวิเคราะห์และออกแบบเชิงวัตถุ การนำซอฟต์แวร์มาใช้ซ้ำ การทำเอกสารประกอบซอฟต์แวร์ การจัดการโครงการซอฟต์แวร์ กรณีศึกษาต่างๆ ของระบบซอฟต์แวร์ในท้องตลาด

(English) Software life cycle; need and specification; large-scale software development; scheduling, developing, constructing, testing and maintenance of software system; object-oriented analysis and design; software reuse; documentation; management of software project; case studies of software system in the market.

2. Credit hours per trimester

Lecture (Hour(s))	Laboratory/field trip/internship (Hour(s))	Self-study (Hour(s))
48 hours (4 hours x 12 weeks)	0 hours	96 hours (8 hours x 12 weeks)

3. Number of hours that the lecturer provides individual counseling and guidance.

1 hours/week



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Section 4 Development of Students' Learning Outcome

1. Short summary on the knowledge or skills that the course intends to develop in students (CLOs)

By the end of the course, students will be able to

1. CLO1 Identify the constraints on software design problem and provide the solution that corresponding to software requirements.
2. CLO2 Design the software system and plan a software project to solve engineering problem.
3. CLO3 Perform software test and construct software test report.

2. Teaching methods for developing the knowledge or skills specified in item 1 and evaluation methods of the course learning outcomes

EGCI 341	Teaching methods	Evaluation Methods
CLO1	Interactive Lecture, Individual assignment, Oral and media presentation	Written Examination, Individual Evaluation Oral Presentation
CLO2	Interactive Lecture, Individual assignment	Written Examination, Individual Evaluation
CLO3	Interactive Lecture, Group assignment	Individual Evaluation, Group Project

Section 5 Teaching and Evaluation Plans

1. Teaching plan

Week	Topic/Details	CLOs	Number of hours					Teaching Method Multimedia	Instructors
			Classroom sessions			Practice	Self-Study		
			Lecture	Visual References/ Demonstration	Online Courses				
1	Introduction to Software Engineering	CLO1			4		8	Interactive Lecture, Individual assignment,	Asst. Prof. Dr. Lalita Narupiyakul
2	Software Process	CLO1			4		8	Interactive Lecture, Individual assignment, Oral and media presentation	



Week	Topic/Details	CLOs	Number of hours				Teaching Method Multimedia	Instructors	
			Classroom sessions			Practice			Self-Study
			Lecture	Visual References/ Demonstration	Online Courses				
3	Software Requirement (1)	CLO1	4				8	Interactive Lecture, Individual assignment	
4	Software Requirement (2)	CLO1	4				8		
5	Software Analysis	CLO2	4				8		
6	Software Design	CLO2	4				8		
7	Examination		2				8	Midterm Assessment	
8	Software Architecture	CLO2	6				8	Interactive Lecture, Individual assignment	
9	Software Components and Software Reuses	CLO2	4				8		
10	Software Testing	CLO3	4				8	Interactive Lecture, Individual assignment, Group assignment	
11	Software Project Management	CLO3	4				8	Interactive Lecture, Individual assignment, Group assignment	
12	Software Cost Estimation	CLO3	4				8	Interactive Lecture, Individual assignment	
13	Final exam								



Week	Topic/Details	CLOs	Number of hours				Teaching Method Multimedia	Instructors	
			Classroom sessions			Practice			Self- Study
			Lecture	Visual References/ Demonstration	Online Courses				
	Number of hours per semester		40		8	0	96		
	Total		48			0	96		

2. Plan for Assessing Course Learning Outcomes

2.1 Assessing and Evaluating Learning Achievement

a. Formative Assessment

The assessment tools such as homework, quizzes, oral and media presentation and exam are used to evaluate student’s understanding by their ability to explain software life-cycle, software process model and software requirement specification. For the software design, students should be able to show how the software are designed by using design techniques and tools given during lectures. The assessments are made through their homework, quizzes and exams. The software testing has to define by applying the appropriate software testing techniques to be able to evaluate software engineering problems. The assessments are made through their homework, quizzes, group assignment and exams.



b. Summative Assessment

(1) Tools and Percentage Weight in Assessment and Evaluation

Learning Outcomes	Assessment Methods	Assessment Ratio (Percentage)	
CLO1 Identify the constraints on software design problem and provide the solution that corresponding to software requirements.	Homework	5	25
	Midterm Exam	15	
	Oral Presentation	5	
CLO2 Design the software system and plan a software project to solve engineering problem.	Homework	5	25
	Midterm Exam	15	
	Quiz	5	
CLO3 Perform software test and construct software test report.	Homework	5	50
	Final Exam	30	
	Group Assignment	10	
	Quiz	5	
Total			100

(2) Grading System

Grade	Achievement	Final Score (% range)	GPA
A	Excellent	90-100	4.0
B+	Very Good	85-89	3.5
B	Good	80-84	3.0
C+	Fairly Good	75-79	2.5
C	Fair	70-74	2.0
D+	Poor	65-69	1.5
D	Very Poor	60-64	1.0
F	Fail	Less than 60	0.0

(3) Re-examination (If course lecturer allows to have re-examination)

N/A - (Not applicable with MUIC)



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3. Student Appeals

The student wishing to appeal according to grading result must submit a written and signed appeal form personally to the academic affair unit. It is prohibited to assign another person to appeal on one's behalf. The written appeal form is then sent to the program director and chair of department. The final decision is transferred for approval by the faculty committee. The result of appeal then is informed to the student.

Section 6 Teaching Materials and Resources

1. Textbooks and/or other documents/materials

1) Ian Sommerville, Software Engineering 10th Edition, Pearson; April 2015, ISBN: 978-0133943030.

2. Recommended textbooks and/or other documents/materials

1) Rod Stephens, Beginning Software Engineering, Wrox, 1st edition March, 2015, ISBN: 978-1118969144

2) Frank Tsui, Orlando Karam, Barbara Bernal, Essentials of Software Engineering, Jones & Bartlett Learning, 4th Edition, December 2016, ISBN: 978-1284106008

3. Other Resources (If any)

Section 7 Evaluation and Improvement of Course Management

1. Strategies for evaluating course effectiveness by students

1.1 Course content

1.2 Course management

1.3 Suggestions

1.4 Overall opinions

2. Strategies for evaluating teaching methods

2.1 Student evaluation



2.2 Presentation

3. Improvement of teaching methods

Use evaluation from 1 and 2 for course improvement

4. Verification process for evaluating students' standard achievement outcomes in the course

Analysis of students' learning outcomes using scores from each CLOs for evaluation.

5. Review and plan for improving the effectiveness of the course

Review the course before trimester starts, before each teaching period and review course contents every 3 years.

Appendix

Alignment between Courses and Program

Table 1 The relationship between course and Program Learning Outcomes (PLOs)

Software Engineering	Program Learning Outcomes (PLOs)					
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6
EGCI 341	R	R	R	R		R

Note: Indicate the level of CLOs by letter I, R, P or M. Using the information as shown in the Curriculum Mapping of TQF2



Table 2 The relationship between CLOs and PLOs

EGCI 341	Program Learning Outcomes (PLOs)					
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6
CLO1 Identify the constraints on software design problem and provide the solution that corresponding to software requirements.		2.1		4.3		
CLO2 Design the software system and plan a software project to solve engineering problem.	1.6		3.1			
CLO3 Perform software test and construct software test report.						6.1

Table 3 The description of PLOs and Sub Los of the course

PLOs	SubPLOs
PLO1 Analyze ethical impacts of computer usage to personals, organizations, social, and the rights and value of others.	1.6 Analyze the regional and international impact of their designed work in personal level, organizational level and social level.
PLO2 Integrate computer engineering knowledge with other related sciences and pursue new knowledge in computer engineering.	2.1 Use computer engineering knowledge to solve problems in other fields.
PLO3 Evaluate the computer requirements and identify the appropriate engineering knowledge and tools for effective problem solving in computer applications.	3.1 Analyze problems that exists in computer system.
PLO4 Generate potential solutions for problem solving with computer engineering knowledge and skills.	4.3 Conclude the problems and requirements in computer related problems.
PLO6 Create a related computer engineering development based on information technology in mathematics or applied statistics.	6.1 Choose information technology tools properly for computer engineering development.