Software Engineering

Course Code:

CSE 344

Course Period:

Spring

Course Type:

Core

Credits:

3

Theoric:

3

Practice:

0

Laboratory Hour:

0

ECTS:

6

Prerequisite Courses:

Data Structures [1]
Course Language:

English

Course Objectives:

This course covers the fundamentals of software engineering. The aim of the course is to transfer knowledge on software development process models, system requirements engineering, formal specification and validation. The students are challenged for finding appropriate engineering compromises and applying effective methods of design, coding, and testing. The course combines a strong technical focus with a capstone project providing the opportunity to practice engineering knowledge, skills, and practices using CASE tools for object-oriented development.

Course Content:

Software development process models and software lifecycle, software requirements analysis and specification, overview of object-oriented software modeling with Unified Modeling Language and exposure to CASE tools for object-oriented development, issues in software quality assurance and software maintenance, experience with CASE tools and environments, and software engineering practices through a term project.

Course Methodology:

1: Lecture, 2: Question-Answer, 3: Lab, 4: Case-study

Course Evaluation Methods:

A: Testing, B: Experiment, C: Homework, D: Project

Course Learning Outcomes	Program Learning Outcomes	Teaching Methods	Assessment Methods
1) Knowledge on software lifecycle and software development process models	1,2	1,2	A
2) Knowledge and ability to conduct software requirements analysis and specification	1,2,3	1,2,4	A, D
3) Knowledge and ability to perform system and object design, and mapping models to code	1,2,3,4	1,2,4	A, D
4) Knowledge and ability to use CASE tools and environments to design and implement software	1,2,3,4	1,2,4	A, D
5) Knowledge and ability to perform software testing	1,2,3,4	1,2,4	A,D
6) Ability to work in groups within a capstone project	6,7	4	D
7) General knowledge on professional and ethical responsibility and societal effects of engineering practices	9,11	1,4	A
8) General knowledge on project, risk, and change management	10	1,4	A

COURSE CONTENT

Week	Topics	Study Materials

1	Introduction: What is software engineering?	Sommerville, chapter 1.1
2	UML as a requirements as well as design modeling tool	Bruegge, Bernd, chapter 1.1
3	Software lifecycle	Sommerville, chapters 1.2
4	SW development process models: Waterfall, rapid prototyping, spiral model, agile processes	Sommerville, chapters 1.2
5	SW development process models: Waterfall, rapid prototyping, spiral model, agile processes	Sommerville, chapters 1.3
6	SW development process models: Waterfall, rapid prototyping, spiral model, agile processes	Sommerville, chapters 1.3
7	SW requirements analysis and specification	Sommerville, chapters 1.4
8	Midterm	–
9	SW design – design verification	Sommerville, chapters 1.5
10	Software implementation	Sommerville, chapter 1.7
11	Software testing	Sommerville, chapter 1.8
12	Software evolution	Sommerville, chapter 1.9
13	Project Presentations	–
14	Project Presentations	–

RECOMMENDED SOURCES

Textbook	Sommerville, Ian. Software Engineering, Global Edition, 10th Edition. Pearson (Intl), 2016.
Additional Resources	Bruegge, Bernd. Object-Oriented Software Engineering Using UML, Patterns, and Java: Pearson New International Edition, 3rd Edition. Pearson (Intl), 2013.

MATERIAL SHARING

Documents	Any material presented in lecture will be posted on the COADSYS page of the course.
Assignments	Assignments will be posted on the COADSYS page of the course.

Exams	Exams and solutions will be posted on the COADSYS page of the course.

ASSESSMENT

IN-TERM STUDIES	**NUMBER**	**PERCENTAGE**
Midterm	1	20
Homework	1	13
Peer review and participation	1	13
Term project	1	54
Total		**100**
CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE		25
CONTRIBUTION OF IN-TERM STUDIES TO OVERALL GRADE		75
Total		**100**

COURSE'S CONTRIBUTION TO PROGRAM

No	Program Learning Outcomes	Contribution				
		1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.					X
2	Ability to identify, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose.					X
3	Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern design methods for this purpose.					X
4	Ability to devise, select, and use modern techniques and tools needed for engineering practice; ability to employ information technologies effectively.					X
5	Ability to design and conduct experiments, gather data, analyze and interpret results for investigating engineering problems.					X

6	Ability to work efficiently in intra-disciplinary and multi-disciplinary teams; ability to work individually.			X
7	Ability to communicate effectively both orally and in writing; knowledge of a minimum of one foreign language.			X
8	Recognition of the need for lifelong learning; ability to access information, to follow developments in science and technology, and to continue to educate him/herself.	X		
9	Awareness of professional and ethical responsibility.		X	
10	Information about business life practices such as project management, risk management, and change management; awareness of entrepreneurship, innovation, and sustainable development.		X	
11	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety; awareness of the legal consequences of engineering solutions.		X	

ECTS ALLOCATED BASED ON STUDENT WORKLOAD BY THE COURSE DESCRIPTION

Activities	Quantity	Duration (Hour)	Total Workload (Hour)
Course Duration (Excluding the exam weeks)	13	3	39
Hours for off-the-classroom study (Pre-study, practice)	14	3	42
Midterm examination	1	2	2
Project	1	70	70
Final examination	1	2	2
Total Work Load			155
Total Work Load / 25 (h)			6.2
ECTS Credit of the Course			6