Software Engineering (1)

Course Definition

Information

Technology

Engineering

Syrian Arab Republic	الجمهورية العربية السورية
Ministry of Higher Education And Scientific Research	وزارة التعليم العالــي والبحث العلمي
Syrian Virtual University	الجامعة الافتراضية السورية

1. Basic Information:

Course Name	Software Engineering (1)
Course Code	BSE601
Number of Presentational Sessions*	2x10
Number of Synchronous Sessions**	10
Number of Shorter Tests***	2
Number of Exams***	1
Theoretical Sessions Work Load (hrs.)	60
Practical Sessions Work Load (hrs.)	30
Credit Hours	6

*Each presentational session comprises both recorded lecture (1.5 hrs.) and interactive learning content (1.5 hrs.).

**Each synchronous session comprises the interactive lecture carried out in real time in a virtual class (1.5 hrs.).

***Each shorter test is 0.5 hr. long. The final exam is 2 hrs. long.

N.B.

Generally, each chapter requires two presentational sessions: one for the recorded content and one for the interactive content (unless the chapter is too long, in which case it may require more sessions). This note applies to synchronous sessions as well, where each chapter requires one synchronous session generally.

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2. Prerequisites courses:

Course	Code
Programming III	BPG601

3. Course Objectives:

This course aims to introduce the student to the most important topics covered by software engineering, which are the general framework within which software development operations take place. There are many axes in this article, some of which may be the subject of an independent course, but reviewing these concepts together and understanding the relationships between them and the interaction of each other with others gives a holistic view and allows an understanding of the mechanisms of software development and the techniques adopted in its management. It enables the student to specifically:

- First: Understanding the methodologies of software development, its importance and the bases on which it is based.
- Second: Understanding the programming procedures models, activities and development.
- Third: Learn about the requirements engineering and procedures and verify the requirements.
- Fourth: Understanding the modeling of software systems in terms of structure, interaction and behavior between its components
- Fifth: The ability to design and implement software systems and to use diagrams in that.
- Sixth: Knowing of techniques and types of tests for software and software systems.
- Seventh: The ability to manage and plan projects in terms of managing risks, people, and teams in software projects. In addition to be able to write the plan of the project.

4. Learning Outcomes (LO):

Upon completion of the course, the student must:

- Understanding software development methodologies, their importance and the foundations upon them.

- Understand the programming procedures models, activities, and development.

- Knowing the requirements engineering and its procedures, verifying the validity of requirements, focusing on concepts of functional and non-functional requirements and the way of writing requirements.

- Knowing of software systems modeling in terms of structure, interaction and behavior between its components

- The ability to design and implement software systems and to use diagrams in it.

- Understanding techniques and types of tests for software and software systems.

- The ability to manage and plan projects in terms of managing risks, people and teams in software projects.

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5. Assessment Results:

Chapter Number	Chapter Title	General Objectives	Assessment Type				
			Interactive Content & Recorded Sessions	Applied Activities (Synch. Sessions)	Final Exam*/ Shorter Tests**	Presentations and Interviews***	Reports***
CH1	Introduction to software engineering	Comprehension –Analytical Thinking –Tools and Application Hands– On	✓	✓	✓	✓	✓
CH2	Software processes	Comprehension –Analytical Thinking –Tools and Application Hands– On	✓	✓	✓	✓	✓
CH3	Requirements engineering	Comprehension –Analytical Thinking –Tools and Application Hands– On	✓	✓	✓	✓	✓
CH4	System modeling	Comprehension –Analytical Thinking –Tools and Application Hands– On	✓	✓	✓	✓	✓

CH5	Design and implementation	Comprehension –Analytical Thinking –Tools and Application Hands– On	✓	✓	✓	✓	✓
CH6	Software testing	Comprehension –Analytical Thinking –Tools and Application Hands– On	✓	✓	✓	✓	✓
CH7	Software evolution	Comprehension –Analytical Thinking –Tools and Application Hands– On	✓	✓	✓	✓	✓
CH8	Project management	Comprehension –Analytical Thinking –Tools and Application Hands– On	✓	✓	✓	✓	✓
CH9	Project planning	Comprehension –Analytical Thinking –Tools and Application Hands– On	✓	✓	✓	✓	✓

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*The final exam is two hours long and is given at the end of the course.

**Shorter tests are about 30 minutes long and are given after three or four lectures throughout the semester during synchronous sessions.

***Presentations, interviews, and reports are submitted once after each three or four lectures throughout the semester during synchronous sessions.

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6. Course Syllabus:

Chapter	Subject	Content	Number of Learning Objects	Number of synchronous Learning Objects
CH1	Introduction to software engineering	1. Professional software development. 2. Software engineering ethics. 3. Case studies.	3	1
CH2	Software processes	1. Software process models. 2. Process activities. 3. Coping with change. 4. Process improvement.	4	2
CH3	Requirements engineering	1. Functional and non-functional requirements. 2. Requirements engineering processes. 3. Requirements elicitation. 4. Requirements specification. 5. Requirements validation. 6. Requirements change.	6	3
CH4	System	1. Context models.	5	2

	modeling	2. Interaction models. 3. Structural models. 4. Behavioral models. 5. Model-driven engineering.		
CH5	**Design and implementation**	1. Object-oriented design using the UML. 2. Design patterns. 3. Implementation issues. 4. Open-source development.	**4**	**2**
CH6	**Software testing**	1. Development testing. 2. Test-driven development. 3. Release testing. 4. User testing.	**4**	**2**
CH7	**Software evolution**	1. Evolution processes. 2. Legacy systems. 3. Software maintenance.	**3**	
CH8	**Project management**	1. Risk management. 2. Managing people. 3. Teamwork.	**3**	**1**
CH9	**Project planning**	1. Software pricing. 2. Plan-driven development. 3. Project scheduling. 4. Agile planning. 5. Estimation techniques.	**5**	**2**

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7. Practical Activity:

- **Tools and Labs:**

Tool Name	Description
Visual Studio	Software development tools
Word, power point, excel	Microsoft office
UML	Object-oriented design using the UML

- **Practical Activities per Chapters:**

Chapter	Activities Type	Remarks
CH1	☑ Exercises ☑ Homework ☐ Webinars ☐ Project ☑ Experiment ☐ Other	
CH2	☑ Exercises ☑ Homework ☐ Webinars ☐ Project ☑ Experiment ☐ Other	
CH3	☑ Exercises	

	☑ Homework ☐ Webinars ☐ Project ☑ Experiment ☐ Other	
CH4	☑ Exercises ☑ Homework ☐ Webinars ☑ Project ☑ Experiment ☐ Other	
CH5	☑ Exercises ☑ Homework ☐ Webinars ☐ Project ☑ Experiment ☐ Other	
CH6	☑ Exercises ☑ Homework ☐ Webinars ☐ Project ☑ Experiment ☐ Other	
CH7	☑ Exercises ☑ Homework ☐ Webinars	

	☐ Project	
	☑ Experiment	
	☐ Other	
CH8	☑ Exercises	
	☑ Homework	
	☐ Webinars	
	☑ Project	
	☑ Experiment	
	☐ Other	
CH9	☑ Exercises	
	☑ Homework	
	☐ Webinars	
	☐ Project	
	☑ Experiment	
	☐ Other	

8. References:

Ian Sommerville, Software Engineering, 10th edition, ISBN 978-0-13-394303-0, published by Pearson Education, 2016.