



الجامعة الافتراضية السورية
SYRIAN VIRTUAL UNIVERSITY

Software Engineering (2)

Course Definition

Information

Technology

Engineering



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1. Basic Information:

Course Name	Software Engineering (2)
Course Code	BSE602
Number of Presentational Sessions*	32
Number of Synchronous Sessions**	16
Number of Shorter Tests***	2
Number of Exams***	1
Theoretical Sessions Work Load (hrs.)	48
Practical Sessions Work Load (hrs.)	24
Credit Hours	5

*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
IT Project Management	GPM601
English Language V	GEN601

3. Course Objectives:

The course "Software Engineering (2)" addresses advanced ideas in software engineering such as software quality management, Component-based and reuse software engineering, Distributed software engineering, Service-oriented software engineering, Software Engineering of Embedded and Real-Time Systems, and Systems dependability and security. This course enables the student to specifically:

First: designing software and software systems according to the required quality standards known globally. Realizing the importance of software quality management standards.

Second: Understanding the intended program component that can be included in the program as an executable component. Understand the key elements of the software component models and the support provided by the intermediaries for these models. Familiar with the main activities in the Component Based Software Engineering (CBSE) process for reuse and the CBSE process with reuse.

Third: Knowing the basic functions that the version control system should provide, and how this is accomplished in centralized and distributed systems. Understanding the challenges of building a system and the benefits of continuous integration and system building.

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Fourth: Understanding the basic concepts of web service, web service standards and service-oriented architecture.

Fifth: Understanding the concept of embedded software, which is used to control systems that interact with external events in their environment.

Understanding the concept of Real-Time Systems

Sixth: Understanding why reliability and security are important features of all software systems. Understand the five critical dimensions of reliability: availability, reliability, safety, security, and resiliency.

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4. Learning Outcomes (LO):

Upon completion of the course, the student must have:

- The ability to design software and software systems according to the required quality standards known globally.
- Knowledge of the basic functions that the version control system must provide, and how this is accomplished in centralized and distributed systems.
- The ability to reuse programs when developing new systems, and how the frameworks can be used in developing the application.
- Familiar with the main activities in the Component Based Software Engineering (CBSE) process for reuse and the CBSE process with reuse.
- Knowing the main issues to be considered when designing and implementing distributed software systems.
- Understand the basic concepts of web service, web service standards, and service oriented architecture.
- Understand why reliability and security are important features of all software systems. Understand the five critical dimensions of reliability: availability, reliability, safety, security, and resiliency.

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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	Software Quality Management	Comprehension –Analytical Thinking – Tools and Application Hands– On	√	√	√		
CH2	Component–based and reuse software engineering	Comprehension –Analytical Thinking – Tools and Application Hands– On	√	√	√		√
CH3	Distributed software engineering	Comprehension –Analytical Thinking –	√	√	√		√

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		Tools and Application Hands- On					
CH4	Service-oriented software engineering	Comprehension -Analytical Thinking - Tools and Application Hands- On	✓	✓	✓		✓
CH5	Software Engineering of Embedded and Real-Time Systems	Comprehension -Analytical Thinking - Tools and Application Hands- On	✓	✓	✓		✓
CH6	Systems dependability and security	Comprehension -Analytical Thinking - Tools and Application Hands- On	✓	✓	✓		✓

*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.

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*****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	Software Quality Management	<ol style="list-style-type: none"> 1. Software Quality Challenge 2. Software Quality Factors 3. SQA Components 4. Software Quality Metrics 5. Measurement and Models 6. Standards and Certificates 7. Software Process Assessment 8. Quality Assurance 	2	
CH2	Component-based and reuse software engineering	<ol style="list-style-type: none"> 1. Components and component models 2. CBSE processes 3. Principles of Component-Based Design 4. Component composition 	2	
CH3	Distributed software engineering	<ol style="list-style-type: none"> 1. What is a distributed system? 2. Distributed Design Principles 3. Types of distributed systems 4. Client-server computing 	2	

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		<ol style="list-style-type: none"> 5. Architectural patterns for distributed systems 6. Applications of distributed computing 		
CH4	Service-oriented software engineering	<ol style="list-style-type: none"> 1. Service-oriented architecture 2. Service-oriented analysis and design 3. Web service standards 4. Service engineering 5. Service composition 	2	
CH5	Software Engineering of Embedded and Real-Time Systems	<ol style="list-style-type: none"> 1. An Introduction 2. What is a Real-Time Embedded System? 3. Classifications for Real-Time Embedded Systems 4. Embedded system design 5. Real-Time Embedded Systems Design Patterns 6. Real-time operating systems 	2	
CH6	Systems dependability and security	<ol style="list-style-type: none"> 1. Dependability properties 2. Considerations in developing dependable software 3. Sociotechnical systems 4. Dependable processes 5. Formal methods and dependability 	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

- **Practical Activities per Chapters:**

Chapter	Activities Type	Remarks
CH1	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Homework <input type="checkbox"/> Webinars <input type="checkbox"/> Project <input checked="" type="checkbox"/> Experiment <input type="checkbox"/> Other	
CH2	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Homework <input type="checkbox"/> Webinars <input type="checkbox"/> Project <input checked="" type="checkbox"/> Experiment <input type="checkbox"/> Other	
CH3	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Homework	

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	<input type="checkbox"/> Webinars <input type="checkbox"/> Project <input checked="" type="checkbox"/> Experiment <input type="checkbox"/> Other	
CH4	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Homework <input type="checkbox"/> Webinars <input checked="" type="checkbox"/> Project <input checked="" type="checkbox"/> Experiment <input type="checkbox"/> Other	
CH5	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Homework <input type="checkbox"/> Webinars <input type="checkbox"/> Project <input checked="" type="checkbox"/> Experiment <input type="checkbox"/> Other	
CH6	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Homework <input type="checkbox"/> Webinars <input type="checkbox"/> Project <input checked="" type="checkbox"/> Experiment <input type="checkbox"/> Other	

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