

**Course specification**  
**(3203 Software Engineering (1))**

<b>Faculty:</b>	<i>HICIT- Higher Institute for Computers &amp; Information Technology-El Shorouk Academy</i>
<b>Programme(s) on which the course is given:</b>	Undergraduate program in Computer Science
<b>Major or minor element of programme:</b>	Compulsory
<b>Department offering the programme</b>	Department of Computer Science
<b>Department offering the course:</b>	Department of Computer Science
<b>Year / Class</b>	3 <sup>rd</sup> Year – 2 <sup>nd</sup> semester
<b>Date of specification approval</b>	1/8/2022

**A- Basic Information**

<b>Title : Software Engineering (1)</b>	<b>Code: 3203</b>
<b>Weekly Hours:</b>	
<b>Lecture: 3</b>	<b>Exercise: -</b>
<b>Practical :3</b>	<b>Total: 6</b>

**B- Professional Information**

**1- Course Aims:**

Provide students with the ability to develop software using the software engineering methodology.

The course will deal with topics such as project management, the software development process, requirements analysis and specification, architectural design and UML.

Student should be able to:

- a. Create software specification.
- b. Manage the software development process.

**2- Program ILOs Covered by Course**

<i>Program Intended Learning Outcomes</i>			
<b>Knowledge and understanding</b>	<b>Intellectual Skills</b>	<b>Professional and practical skills</b>	<b>General and Transferable skills</b>
A3, A9, A11, A15, A16, A17, A18, A21, A22	B1, B2, B4, B5, B6, B7, B8, B9, B11, B12, B14, B15, B18, B19	C2, C3, C4, C5, C6, C9, C10, C11, C13, C15, C17, C18, C19	D1, D2, D3, D6, D7, D8, D9, D10, D12

**3- Intended learning outcomes of course (ILOs)**

**a. Knowledge and Under-Standing:**

- a1. Explain the importance of product and process quality in the software development process.[A3, A9]
- a2. Describe how the phases of the lifecycle can be managed using different models of the lifecycle.[A9,A11]
- a3. Mention the properties of good software and how these relate to different types of software.[A15,A16]

a4. Explain the goals and deliverables of each phase of the software lifecycle, be able to select and apply appropriate techniques to achieving some of these goals and be able to accurately document the results. [A11, A15, A16, A17, A21, A22]

**b. Intellectual Skills:**

- b1. Demonstrate how a software team generates reliable estimates of effort, and project plans. [B1]
- b2. Illustrate the basic concepts and principles to the analysis of software requirements. [B1, B14, B15]
- b3. Illustrate the basic concepts and principles to the design of software activity. [B12, B14]
- b4. Discuss important issues in the management of software. [B18, B19]
- b5. Evaluate the categorize application domains for computer software. [B12, B18]

**c- Professional and practical skills**

- c1. Apply the process models to software development. [C2, C3, C5, C6]

**d- General and transferable skills**

- d1. Collaborate effectively within multidisciplinary team. [D2,D3, D10]
- d2. Work in stressful environment and within constraints. [D6, D7]
- d3. Prepare technical reports, and a dissertation, to a professional standard; use IT skills and display mature computer literacy. [D1, D8, D9, D12]
- d4. Lead and motivate individuals. [D6]
- d5. Search for information and adopt life-long self-learning. [D8]

**4- Contents**

<b>Topic</b>	<b>Hours</b>	<b>Lec.</b>	<b>Exc/Lab</b>
Software Engineering Concepts & Historical Perspective	6	3	3
Software Life Cycle Paradigms	6	3	3
Software project management	9	3	6
The software process	6	3	3
System models	9	6	3
Software Requirements Definition	9	6	3
UML	12	6	6
Architecture design	6	3	3
Selected Topics	3	3	-
Course project	12	3	9

## 5- Teaching and learning methods

Teaching and learning methods	Used
<b>Active Learning</b>	
Lectures (blending learning – online learning using virtual classroom)	√
Tutorial Exercises (hybrid learning – online learning)	√
Practical Lab (blending learning– online learning)	√
Exercises	-
Discussions.	√
<b>Self – Learning strategy</b>	
Reading material	√
Websites search	√
Research and reporting	√
Self-studies	√
<b>Experimental strategy</b>	
Group work	√
Presentation	-
<b>Problem solving strategy</b>	
Problem solving/problem solving learning based	√
Case study	√
<b>Synchronous E-Learning</b>	
Virtual lab	-
Virtual class	-
Chat Room	√
Video lectures	√
<b>Asynchronous E-Learning</b>	
E-Learning	√

## 6- Student assessment methods

Methods	Assessment	Used
Electronic Midterm Exam	To assess the knowledge and understanding achieved by the student during the previous weeks. (Online on e-learning hub)	√
Pencil-to-Paper Final Exam	To evaluate what the student gain at the end of the course, and to assess: the knowledge and understanding, general skills, and intellectual skills.	√
Course Project	To allow students work in team, and to evaluate knowledge, understanding, intellectual, and transferable skills. (Online on e-learning hub, FTF)	√
Electronic Course Work & Quizzes	To keep the student always in the course, and to evaluate knowledge, understanding, intellectual, and transferable skills. (Online on e-learning hub)	√
Practical Exam	To measure the ability of students to design and implement a software program (FTF).	√
Participation	To assess the knowledge and understanding achieved by the student during the previous weeks.	√

### Assessment Schedule

Assessment	Week #
Mid Term Exam	8
Final Exam	16
Course Project	3-14
Course Work & Quizzes	2-14
Practical Exam	15

### Assessment Weight

Assessment	Weight %
Mid Term Exam	5%
Final Exam	70%
Course Project	10%
Course Work & Quizzes	5%
Practical Exam	10%
<b>Total</b>	<b>100</b>

- Course Work & Quizzes:
  - o Short Exams, Assignments, Researchs, Reports, Presentations on e-learning hub
  - o Class/Project discussion

## 7- List of references

<b>Essential books (textbooks)</b>	<ul style="list-style-type: none"> <li>Sommerville, Ian. <i>Engineering Software Products: An Introduction to Modern Software Engineering, Global Edition</i>. 2021.</li> </ul>
<b>Course notes</b>	<ul style="list-style-type: none"> <li><a href="http://www.comp.lancs.ac.uk/computing/resources/IanS/">www.comp.lancs.ac.uk/computing/resources/IanS/</a></li> <li><a href="http://www.sei.cmu.edu/">www.sei.cmu.edu/</a></li> </ul>
<b>Recommended books</b>	<ul style="list-style-type: none"> <li>Freeman, Eric, and Elisabeth Robson. <i>Head First Design Patterns: Building Extensible and Maintainable Object-Oriented Software</i>. 2021.</li> </ul>
<b>Periodicals, website</b>	<ul style="list-style-type: none"> <li>PowerPoint presentations of all course materials</li> <li>All labs material</li> <li>[<a href="https://moodle.sha.edu.eg/course/view.php?id=2263">https://moodle.sha.edu.eg/course/view.php?id=2263</a>]</li> </ul>

## 8- Required Facilities

To assess professional and practical skills given the following facilities:

a. Tools & SW (Technologies facilities):

- **Microsoft Project**
- **Microsoft SQL server 2016 platform**
- **Microsoft Visual Studio 2015 and ADO.NET to connect database with c# code**
- **.Net framework**
- **Asp.Net (MVC)**
- **Portal (MOODLE) to make electronic quizzes and electronic midterm exam**
- **Portal (MOODLE) to upload project deliverable and assignment**
- **Academy portal (MOODLE) to upload electronic material**

b. Teaching facilities:

	<i>Lecture</i>	<i>class</i>	<i>Lab</i>
Whiteboard	used	-	used
Pc/laptop	used	-	used
Data show	used	-	used
Webinars	MS TEAMS	-	MS TEAMS
Social Media	Facebook Page for 3 <sup>rd</sup> year	-	Facebook Page for 3 <sup>rd</sup> year
Chat Room	Chat Teams	-	Chat Teams
Videos	Stream-MOODLE	-	Stream-MOODLE
Website	MOODLE	-	MOODLE

## 9- Course Matrices

### 9.1- Course Content/ILO Matrix

Course Contents	Knowledge and understanding				Intellectual skills					Professional and practical skills	General					
	a1	a2	a3	a4	b1	b2	b3	b4	b5		c1	d1	d2	d3	d4	d5
Software Engineering Concepts & Historical Perspective	√															
Software Life Cycle Paradigms	√	√		√												
Software project management	√	√			√			√								
The software process			√		√				√							
System models			√													
Software Requirements Definition			√			√										
UML										√						
Architecture design							√									
Selected Topics																
Course project											√	√	√	√	√	

### 9.2 Learning Method /ILOs Matrix

Learning Methods	Knowledge and understanding				Intellectual skills					Professional and practical skills	General					
	a1	a2	a3	a4	b1	b2	b3	b4	b5		c1	d1	d2	d3	d4	d5
Lectures	x	x	x	x	x	x	x	x	x	x	x					
Tutorial Exercises						x	x	x	x	x	x					
Reading material	x	x	x	x	x	x	x	x	x	x	x					
Websites search	x	x	x	x	x	x	x	x	x		x			x	x	x
Research and reporting	x	x	x	x										x	x	
Problem solving/problem solving learning based								x	x							
Group work										x	x			x	x	x
Presentations																
Practical Lab						x	x	x	x	x	x					

Discussions.						x	x	x	x	x		x		x	x	x	x	x
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### 9.3 Assessment Methods /ILOs Matrix

Assessment Methods	Knowledge and understanding				Intellectual skills					Professional and practical skills	General				
	a1	a2	a3	a4	b1	b2	b3	b4	b5	c1	d1	d2	d3	d4	d5
Mid Term Exam	√	√	√	√	√	√	√	√	√	√					
Final Exam	√	√	√	√	√	√	√	√	√	√					
Course Project	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Course Work & Quizzes	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Practical Exam	√	√	√	√	√	√	√	√	√	√					

### 10. Course ILOs Vs Program ILOs

Prog ILOs	Course ILOs	Knowledge & understanding								Intellectual skills															Professional and practical skills									General																
		A3	A9	A11	A15	A16	A17	A18	A21	A22	B1	B2	B4	B5	B6	B7	B8	B9	B11	B12	B14	B15	B18	B19	C2	C3	C4	C5	C6	C9	C10	C11	C13	C15	C17	C18	C19	D1	D2	D3	D6	D7	D8	D9	D10	D12				
k&u	a1	√																																																
	a2		√																																															
	a3			√																																														
	a4				√	√	√		√	√																																								
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	d2																																								√	√					√	√		
	d3																																								√	√					√	√		
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	d5																																																	

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Date: 1/8/2022