University/Academy: Arab Academy for Science and Technology & Maritime Transport
Faculty/Institute: College of Computing and Information Technology
Program: Software Engineering / Computer Science / Information Systems

Form No. (12)
Course Specification

1- Course Data

Course Code:	Course Title:	Academic Year/Level:
SE491	Software Component Design	Year 4 / Semester 7

Specialization:	No. of Instructional Units:	Lecture:
Software Engineering	2 hrs lecture 2 hrs lab	

2- Course Aim	This course deals with the design and implementation of software subsystems. The concept of design patterns is introduced and common patterns are applied to the development of software components. Laboratory projects provide an opportunity for teams of students to implement components and to integrate them into complete system. It introduces the use of Computer-Aided Software Engineering (CASE).

3- Intended Learning Outcome:

a- Knowledge and Understanding	**Students will be able to demonstrate knowledge of:** K12. Understanding essential facts, concepts, principles and theories relevant to software engineering. K15. Demonstrate strong knowledge of software systems analysis & design, data and Information Management, software project management, and software development models. K19. Perform specification, analysis, design, implementation and testing of software solutions. K21. Types and alternatives of software systems architectures, and their differences in terms of performance, cost consequences, and their implications for the software quality attributes needed.
b- Intellectual Skills	**By the end of the course, the student acquires high skills and an ability to understand:** I10. Identify and define traditional and nontraditional software systems problems, set goals towards solving them, and observe results. I11. Perform comparisons between (methods, techniques, strategies ...etc). I12. Identify attributes, components, relationships, patterns, main ideas, and errors.

c- Practical and Professional Skills	<u>**By the end of the course the student will have the ability to:**</u> P15. Using tools to automate software development phases. P16. Analyze and documenting the feasibility of various options and comparing solution options using multiple decision criteria P18. Maintaining existing software systems P20. Deploy effectively the tools used for the construction and documentation of software, with particular emphasis on understanding the whole process involved in using computers to solve practical problems.
d- General and Transferable Skills	**Students will be able to:** G1. Demonstrate the ability to make use of a range of learning resources and to manage one's own learning. G3. Show the use of information-retrieval. G7. Show the use of general computing facilities.
4- Course Content	<table><tr><td>**#**</td><td>**CLO**</td></tr><tr><td>1</td><td>Understand basic components of object oriented programming</td></tr><tr><td>2</td><td>Understand and apply object-oriented design patterns</td></tr><tr><td>3</td><td>Understand the use of UML in the design process</td></tr><tr><td>4</td><td>Design and implement small SW components</td></tr><tr><td>5</td><td>Use computer-aided SW engineering (CASE) tools</td></tr><tr><td>6</td><td>Perform independent research on software design</td></tr><tr><td>7</td><td>Communicate SW design concepts in a brief oral presentation</td></tr></table>
5- Teaching and Learning Methods	Lectures, Labs, Projects, Individual study & self-learning.
6- Teaching and Learning Methods for Students with Special Needs	• Students with special needs are requested to contact the college representative for special needs (currently Dr Hoda Mamdouh in room C504) • Consulting with lecturer during office hours. • Consulting with teaching assistant during office hours. • Private Sessions for redelivering the lecture contents. For handicapped accessibility, please refer to program specification.
7- Student Assessment:	
a- Procedures used:	Exams and Individual Projects
b- Schedule:	Week 7 exam 1 Project through the semester 2 Lab quizes through the semester Week 16 Final exam
c- Weighing of Assessment:	7th week exam 20% Lab quiz 1 10% Lab quiz 2 10% Project 20% Final exam 40%

8- List of References:	
a- Course Notes	From the Moodle on www.aast.edu
b- Required Books (Textbooks)	Gamma, R. Heml, R. Johnson, and J. Vlissides, Design Patterns: Elements of Reusable Object-Oriented Software Engineering, Addison-Wesley, 1995, 37th printing 2009.
c- Recommended Books	• Michael R. Blaha, and James R. Rumbaugh, Object-Oriented Modeling and Design with UML, Prentice Hall, 2005. • Terry Quatrani, , Visual Modeling with Rational Rose 2002 and UML, 3rd Edition, Addison-Wesley, 2003.
d- Periodicals, Web Sites, ..., etc.	

Course Instructor:

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Head of Department:

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