Zarqa University
Faculty: Information Technology
Department: Software Engineering
Course title: Software Design and Architecture (1503370)

Instructor:
Lecture's time:
Semester:
Office Hours:

Course description:

Software Design and Architecture course Design concepts: definition, fundamentals, context, principles, quality attributes. Design strategies: function-oriented, object-oriented, data-structure, and aspect-oriented design. Architectural design: styles, hardware issues, requirements traceability, domain-specific, architectural notations.

Aims of the course:

1. To develop a thorough understanding of students towards software design. Various aspects of software design like design approaches, design quality, design evolution, design environments and tools, etc. will be highlighted and discussed.
2. To learn how to work in teams.
3. To enhance communication and writing skills.
4. To instill life-long learning skills.

Intended Learning Outcomes: (ILOs)

A. Knowledge and Understanding

A1. Concepts and Theories:

Define the basic concepts of a design.
Build an architectural design to software.
Design the principles of human computer interaction to software.
Understand the design tools and methods.

A2. Contemporary Trends, Problems and Research:

A3. Professional Responsibility:

B. Subject-specific skills

B1. Problem solving skills:

Learn How to design software with high quality.

B2. Modeling and Design:

Learn the different models of design.

B3. Application of Methods and Tools:.

Learn How to use the different design models and patterns to design a good software.

C. Critical-Thinking Skills

C1. Analytic skills: Assess

Distinguish between the different architectural styles and design models.

C2. Strategic Thinking:

Understanding models and patterns of software design.

C3. Creative thinking and innovation:

Plan how to design a software.

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication:

D2. Teamwork and Leadership:

Discuss and work in a group in order to apply several models of software design.

Course structures:

Week	Credit Hours	ILOs	Topics	Teaching Procedure	Assessment methods
1	3	A1	• Introduction • Review of Software Engineering	Presentation methods and techniques, Sources of information and Instructional Aids	Diagnostic tests to identify the students level and areas of weakness Formal (stage) evaluation a) Class Participation b) Ist Exam c) 2nd Exam d) Activity file
2	3	A1	• Introduction to Software Design	Presentation methods and techniques, Sources of information and Instructional Aids	Diagnostic tests to identify the students level and areas of weakness Formal (stage) evaluation a) Class Participation b) Ist Exam c) 2nd Exam d) Activity file
3,4	4	A1, B1	• Design Principals	Presentation methods and techniques, Sources of information and Instructional Aids	Diagnostic tests to identify the students level and areas of weakness Formal (stage) evaluation a) Class Participation b) Ist Exam c) 2nd Exam d) Activity file
4,5	4	A1,B1,B2	• Requirements and Domain Classes	Presentation methods and techniques, Sources of information and Instructional Aids	Diagnostic tests to identify the students level and areas of weakness Formal (stage) evaluation a) Class Participation b) Ist Exam c) 2nd Exam d) Activity file
5,6	3	B1, C1	• Software Architecture	Presentation methods and techniques, Sources of information and Instructional Aids	Diagnostic tests to identify the students level and areas of weakness Formal (stage) evaluation a) Class Participation b) Ist Exam c) 2nd Exam d) Activity file
6	1	A1,B1,B2	• Frameworks	Presentation methods and techniques, Sources of information and Instructional Aids	Diagnostic tests to identify the students level and areas of weakness Formal (stage) evaluation a) Class Participation b) Ist Exam c) 2nd Exam d) Activity file

7	3	A1, B2, B3	• Introduction to Design Patterns	Presentation methods and techniques, Sources of information and Instructional Aids	Diagnostic tests to identify the students level and areas of weakness Formal (stage) evaluation a) Class Participation b) Ist Exam c) 2nd Exam d) Activity file
8	3	A1, B2, B3, C1,C2,C3	• Creational Design Patterns	Presentation methods and techniques, Sources of information and Instructional Aids	Diagnostic tests to identify the students level and areas of weakness Formal (stage) evaluation a) Class Participation b) Ist Exam c) 2nd Exam d) Activity file
9	3	A1, B2, B3, D1, D2	• Structural Design Patterns	Presentation methods and techniques, Sources of information and Instructional Aids	Diagnostic tests to identify the students level and areas of weakness Formal (stage) evaluation a) Class Participation b) Ist Exam c) 2nd Exam d) Activity file
10,11	5	A1,B1,B2	• Introduction to Components	Presentation methods and techniques, Sources of information and Instructional Aids	Diagnostic tests to identify the students level and areas of weakness Formal (stage) evaluation a) Class Participation b) Ist Exam c) 2nd Exam d) Activity file
11	1	A1,B1,B2	• JavaBeans • CORBA	Presentation methods and techniques, Sources of information and Instructional Aids	Diagnostic tests to identify the students level and areas of weakness Formal (stage) evaluation a) Class Participation b) Ist Exam c) 2nd Exam d) Activity file
12,13	5	A1,B1,B2, C1, C2, C3	• Finalizing the Application Design	Presentation methods and techniques, Sources of information and Instructional Aids	Diagnostic tests to identify the students level and areas of weakness Formal (stage) evaluation a) Class Participation b) Ist Exam c) 2nd Exam d) Activity file
13,14	4	A1,B1,B2, C1, C2, C3	• Software Evolution • Reengineering and Reverse Engineering • Software Measurement and Software Metrics	Presentation methods and techniques, Sources of information and Instructional Aids	Diagnostic tests to identify the students level and areas of weakness Formal (stage) evaluation a) Class Participation b) Ist Exam c) 2nd Exam d) Activity file

References:

A. Main Textbook:

"Software Design: From Programming to Architecture" by Eric J. Braude, John Wiley & Sons, 2004, ISBN: 0 - 471- 42920 -1.

B. Supplementary Textbook(s):

Summerville, I. *Software Engineering,* Addison Wesley Longman Publishing Co., Inc.**(5),** March 2010.

David Budgen, Software Design, 2003,2nd edition, Addison Wesley

Assessment Methods:

Methods	Grade	Date
First Exam	20%	
Second Exam	20%	
Assignments (Reports /Quizzes/ Seminar / Tutorials ….)	10%	
Final Examination	50%	