Zarqa University
Faculty
Department: Software Engineering
Course title: Software Modeling
(1503272)

Instructor: Dr. Issam Jebreen
Lecture's time: 8-9, 11-12.30
Semester: Second/2015/2016
Office Hours: 10-11

Course description:

This course aims to introduce the student to fundamental concepts of object oriented approach to development based on modeling objects from the real world and then using the model to build the language independent design organized around objects.

Aims of the course:

1) Interpret / give the meaning of object-oriented concepts.
2) Understand different Modeling Methodology.
3) Prepare an object model for a given problem statement.
4) Prepare dynamic for a given problem statement.
5) Describe and Design the concepts of class diagram, object diagram, interaction diagram, sequence diagram collaboration, use case diagram, state diagram , activity.
6) Usage of anyone design tool.

Intended Learning Outcomes: (ILOs)

A. Knowledge and Understanding

A1. Concepts and Theories:

- Understand the basic of concepts modeling.

A2. Contemporary Trends, Problems and Research:

- Understand the theory and principles behind Object Oriented Programming and its realization.

A3. Professional Responsibility:

- Describe some notation

B. Subject-specific skills

B1. Problem solving skills:

- Describe some notation that can be used to analyze problem requirement.

B2. Modeling and Design:

- Use of programming language constructs in program implementation.

B3. Application of Methods and Tools:.

- Use of programming language constructs in program implementation.

C. Critical-Thinking Skills

C1. Analytic skills: Assess

- To be able to apply different logics to solve given problem.

C2. Strategic Thinking:

- To be able to write program using different implementations for the same problem

C3. Creative thinking and innovation:

- To be able to write program using different implementations for the same problem

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 study several cases, each of which has issues affecting the software modeling in such a way.

Course structures:

Week	Credit Hours	ILOs	Topics	Teaching Procedure	Assessment methods
1	3	A1	Introduction What is Object Orientation? What is OO Development?	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	Modeling Concepts Class Model Object and Class Concepts • Link and Association Concepts • Generalization and Inheritance • A Sample Class Model Navigation of Class Models	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, A3	Class Model Generalization and Inheritance • A Sample Class Model Navigation of Class Models	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,A2, A3	Rational Rose Tool • Practical section using Rose Tool (Lab section)	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	Advanced Class Modeling • Advanced Object and Class Concepts • Association Ends • N-ary Associations • Aggregation • Abstract Classes • Multiple Inheritance • Metadata • Constraints • Derived Data • Packages	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	B2, B3	State Modeling • Events • States • Transitions and Conditions • State Diagrams • State Diagram Behavior	Presentation methods and techniques, Sources of information and Instructional	Diagnostic tests to identify the students level and areas of weakness Formal (stage) evaluation a) Class Participation b) Ist Exam c) 2nd Exam

				Aids	d) Activity file
8	3	B2, B3	Advanced State Modeling • Nested State Diagram • Nested States • Signal Generalization • Concurrency • A Sample State Model • Relation of Class and State Models	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	B2, B3	Interaction Modeling • Use Case Models • Use Case Relationships • Sequence Models • Procedural Sequence Models • Activity Models • Special Constructs for Activity Models	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	C2, C3	Domain Analysis • Overview of Analysis • Domain Class Model • Domain State Model	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	D1, D2	Application Analysis • Application Interaction Model • Application Class Model • Application State Model • Adding Operations	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	C1,C2,C3	System Design • Estimate system performance • Make a reuse plan • Organize the system into subsystems • Identify concurrency inherent in the problem	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	C1,C2,C3	System Design • Allocate subsystems to hardware • Manage data stores • Handle global resources • Choose a software control strategy	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
15	3	C1,C2,C3	System Design • Handle boundary conditions • Set trade-off priorities • Select an architectural style		

References:

A. Main Textbook:

Object Oriented Modeling and design with UML, 2nd edition, Michael Blaha and James Rumbaugh

B. Supplementary Textbook(s):

- Brooks, F.P., (1987) No Silver Bullet: Essence and Accidents of Software Engineering, Computer, 20 (4), 10-19
- Highsmith, J. (2002). Agile Software Development Ecosystems. London: Addison-Wesley
- Holt, J. (2001). UML for Systems Engineering. London: IEE
- Sommerville,I. (2004) Software Engineering (7th ed), London: Addison-Wesley
- Sommerville, I. & Sawyer,P. (1997). Requirements Engineering: A good practice guide. Chichester: Wiley
- Standish Group (2004) The CHAOS Report. Retrieved from http://www.standishgroup.com/sample_research/chaos_1994_1.php on 28th February 2007
- Stevens, R., Brook, P., Jackson, K. & Arnold, S. (1998). Systems Engineering: Coping with Complexity. London: Prentice Hall
- Weigers, K. (2003) Software Requirements (2nd ed), Redmond: Microsoft Press
- Leffingwell, D. & Widrig,D. (2000). Managing Software Requirements: A Unified Approach. London: Addison-Wesley

Assessment Methods:

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