



Course Specifications

Course Title:	Software Modeling and Analysis
Course Code:	CS413
Program:	Computer Science
Department:	Computer Science
College:	College of Computer and Information Sciences
Institution:	Majmaah University



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A. Course Identification

1. Credit hours:	3 (3,0,1)
2. Course type	
a.	University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b.	Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered: Level 10	
4. Pre-requisites for this course (if any): CS 360-Software Engineering	
5. Co-requisites for this course (if any):	

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	44	100
2	Blended		
3	E-learning		
4	Distance learning		
5	Other		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	33
2	Laboratory/Studio	
3	Tutorial	11
4	Others (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description

This course presents an integrated set of techniques for software analysis and design based on object-oriented concepts and the UML notation. Topics include introduction to object concepts, fundamentals of object oriented analysis and design process, use-case analysis, object modeling using behavioral techniques, design patterns, design quality and metrics.

2. Course Main Objective

This course introduces students to the concepts of Software Modeling like object-oriented analysis and design, developing uses cases, interaction diagrams, class diagrams, activity diagram, software quality and software cost estimation methods.



3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge and Understanding	
1.1		
1.2		
1.3		
1...		
2	Skills :	
2.1	CLO2 - Develop object-oriented designs by applying established design principles	S2
2.2	CLO3- Develop use-case and scenario descriptions of the requirements	S2
2.3	CLO4 - Develop richer descriptions of design models using UML diagrams	S2
2...		
3	Competence:	
3.1	CLO1-Understand the role of analysis and design in the software engineering lifecycle	C2
3.2	CLO5- Understand the role and influence of design patterns and frameworks in software design	C2
3.1	CLO1-Understand the role of analysis and design in the software engineering lifecycle	C2
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to object concepts	4
2	Fundamentals of object oriented analysis and design process	4
3	Inception, Understanding Requirements, Use-Case Model	4
4	Identifying Other Requirements, From Inception to Elaboration	4
5	Elaboration, Use-Case Model: Drawing System Sequence Diagrams, Domain Model: Visualizing Concepts, Adding Associations, Adding Attributes	4
6	Interaction Diagram Notation, GRASP: Designing Objects with Responsibilities	4
7	Determining Visibility, Creating Design Class Diagrams, Mapping Designs to Code	4
8	Designing Use-Case Realizations with GoF Design Patterns	4
9	Modeling Behavior in Statechart Diagrams	4
10	Designing the Logical Architecture with Patterns, Design quality and metrics	4
11	Revision	4
Total		44



D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge and Understanding		
1.1			
1.2			
...			
2.0	Skills		
2.1	CLO2 - Develop object-oriented designs by applying established design principles	Classroom Teaching	Assignment, Mid Exam, Final Exam
2.2	CLO3- Develop use-case and scenario descriptions of the requirements	Classroom Teaching	Assignment, Mid Term,
2.3	CLO4 - Develop richer descriptions of design models using UML diagrams	Classroom Teaching	Assignment, Mid Exam, Case Study
3.0	Competence		
3.1	CLO1-Understand the role of analysis and design in the software engineering lifecycle	Classroom Teaching	Quiz, Mid Exam, Final Exam
3.2	CLO5- Understand the role and influence of design patterns and frameworks in software design	Classroom Teaching	Assignment, Final Exam
...			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes	Week4, Week 9	10%
2	Assignments / Project / Lab	Week 7,8	20%
3	Mid Term Exam	Week 6	20%
4	Case Study	Week 9	10%
5	Final Exam	Week 12	40%

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

Each student is allotted to an academic advisor for guidance and counselling.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development”, by Larman, Craig, 3rd edition, 2008
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Essential References Materials	1. Computer Security: Art and Science (2 Volume Set) 1st Edition, Matt Bishop, Addison-Wesley Professional, 2015 2. Core Software Security: Security at the Source 1st Edition, James Ransome and AnmolMisra, Auerbach Publications, 2013. 3. Fundamentals of Information Systems Security, 2nd Edition, David Kim and Michael G. Solomon, Jones & Bartlett Learning, 2014.
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom
Technology Resources (AV, data show, Smart Board, software, etc.)	PC or Laptop with Windows/Linux, Smart Board, Projector
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Internet Connection, Free / Open source tools like Visio, Eclipse Plug-ins available for UML.

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Final Exam Answer Scripts Verification	Peer faculty members	Review
Course Learning Outcomes Feedback	Students	Survey
Final Exam evaluation	Students	Survey

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	CS Council	
Reference No.		
Date		