American University of Sharjah | College of Engineering

- 1. Course number and name CMP 450 – Object Oriented Software Engineering
- 2. Credits and contact hours 3 credit hours, 3 contact hours
- **3. Prerequisites or co-requisites** <u>Prerequisites:</u> CMP 305 (Data Structures and Algorithms)
- 4. Name and Contact Information of Instructor Dr. Hicham H. Hallal

5. Course Description (Catalog Description)

Explores object-oriented analysis and design. Covers topics in object-oriented analysis and design: object-oriented requirements capturing, modeling and refinement. Includes object-oriented design, design patterns, and object-oriented testing. Requires completion of a substantial object-oriented software project.

6. Textbook, title, author, and year

David Kung, *Object-Oriented Software Engineering: An Agile Unified Methodology*, McGraw-Hill Higher Education, 2014.

Supplemental material

- R. Laganiere and T. C. Lethbridge, *Object-Oriented Software Engineering: Practical Software Development using UML and Java*, 2nd edition. McGraw-Hill, 2005.
- G. Booch, J. Rumbaugh and I. Jacobson, *The Unified Modeling Language User Guide*, Second Edition, Addison Wesley, 2005

7. Specific goals for the course

Upon completing the course, student will be able to:

- 1. List and explain the primary principles underlying objected-oriented analysis and design methodologies.
- 2. Describe the object-oriented software development process from requirements gathering to implementation.
- 3. Model software requirements using UML use cases.
- 4. Build UML models for a non-trivial software system.
- 5. Effectively use UML modeling tools to design and debug software models.
- 6. Recognize and apply basic software design and architecture patterns to a non-trivial problem.
- 7. Derive appropriate test-suites from an object-oriented design model.
- 8. Apply object-oriented software engineering techniques to design, implement and test a real world group project.

8. Teaching and Learning Methodologies

Methods include lectures, labs, homework assignments, quizzes, exams and class discussions, term project

9. Course Topics and Schedule:

Торіс	Weeks
Review of OO Analysis and Design Principles	1
Introduction to UML	
Static and Dynamic Modeling Notations and tools in UML	1
	1
The Unified Process in Software Engineering	
Inception	1
Requirements Modeling (Use Cases)	2
Test Derivation (from Scenarios)	1
Design (evaluating complexity and choosing proper architecture)	1
Using Patterns in Software Design: Façade, Strategy, Bridge, Adapter	1
UML Class Diagram and Sequence Diagrams	1
UML State Charts and Activity Diagrams	2
Implementation & Testing	1
Introduction to Agile Development: Extreme Programming, Scrum and Test	2
Driven Development	
Review	1
Total	16