

**Arab Academy for Science and Technology and Maritime Transport
Software Engineering Curriculum
Course Syllabus**

Course Code: SE491	Course Title: Software Component Design	Classification: E	Coordinator's Name: Dr. Walid Rabie Lecturer: Dr. Walid Rabie	Credit Hours: 3
Pre-requisites: SE291 (Introduction to Software Engineering)	Co-requisites: None	Schedule: Lecture: 2 hours Tutorial-Lab: 2 hours		
Office Hours: (Room 310) Monday 10:30 a.m. -12:30 p.m.				
Course Description: 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 systems. It introduces the use of Computer-Aided Software Engineering (CASE).				
Textbook: J. M. Smith, <i>Elemental Design Patterns</i> , Addison Wesley.				

References:

- Michael R. Blaha, and James R. Rumbaugh, *Object-Oriented Modeling and Design with UML*, Prentice Hall.
- Gamma, R. Helm, R. Johnson, and J. Vlissides, *Design Patterns: Elements of Reusable Object-Oriented Software Engineering*, Addison-Wesley.

Course Objective:

1. Understand and apply object-oriented design patterns.
2. Understand the use of UML in the design process.
3. Design and implement small software components and systems.
4. Use computer-aided software engineering (CASE) tools in the design process

Contribution to Program Student Outcomes:

SO -2: Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.

5. .Perform research on software design patterns.
6. Document software design concepts in a written report.
7. Communicate software design concepts in a brief oral presentation

SO -3 : Communicate effectively in a variety of professional contexts.

SO- 5: Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.

Course Outline:

1. Revision of Object Oriented principles
2. Introduction to pattern design
3. Singleton, Factory, and Abstract Factory Design Pattern
4. Builder and Prototype Design patterns
5. Adapter and Bridge Design patterns
6. Composite, Decorator and Façade Design Patterns\
7. 7th Week Exam
8. Proxy, Chain of responsibility,
9. Command and Interpreter Design Patterns
10. Observer, Strategy and Template Design pattern.
11. Visitor and Data Access Object Design pattern.
12. Component-based software architecture
13. Principles of Component-Based Design
14. Project Presentations and Demo
15. Revision
16. Final Exam

Grade Distribution:**7th Week Assessment (30%):**

Exam (30%)

12th Week Assessment (20%):

Term Project (20%)

Year Work (10%):

Homework Assignments (10%)

Final Exam (40%)

Policies:

Attendance:

AASTMT Education and Study Regulations (available at aast.edu)

Academic Honesty:

AASTMT Education and Study Regulations (available at aast.edu)

Late Submission:

Late submissions are graded out of 75% (1 week late), 50% (2 weeks late), 25% (3 weeks late), 0% (more than 3 weeks late)