



**Jordan University of Science and Technology**  
**Faculty of Computer & Information Technology**  
**Software Engineering Department**

SE324 Software Architecture & Design
Second Semester 2022-2023

Course Catalog
3 Credit Hours. This course walks students through the software design phases: Software Architecture and Internal Detailed Design. During each design phase, the focus is mainly on the best-known design principles, concepts, patterns, and interfaces. Further, throughout this course, the students learn how to apply those concepts to design and implement practical software problems (usually using UML and Java).

Text Book	
<b>Title</b>	Software Engineering Design: Theory and Practice
<b>Author(s)</b>	Otero, Carlos E.,
<b>Edition</b>	1st Edition
<b>Short Name</b>	Ref #1
<b>Other Information</b>	

**Course References**

Short name	Book name	Author(s)	Edition	Other Information
Ref #2	Software Modeling and Design: UML, Use Cases, Patterns, and Software Architectures	Hassan Gomaa	1st Edition	
Ref #3	Head First Design Patterns	Eric Freeman, Bert Bates, Kathy Sierra,	4th Edition	

Instructor	
Name	Dr. KHALDOON ALZOUBI
Office Location	M2L2
Office Hours	Sun : 09:00 - 09:30 Sun : 13:30 - 14:30 Mon : 09:30 - 11:00 Tue : 09:00 - 09:30 Tue : 13:30 - 14:30 Thu : 09:00 - 09:30 Thu : 13:30 - 14:30
Email	ktalzoubi@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Sun, Tue, Thu : 09:30 - 10:30 Room: A2122

Prerequisites		
Line Number	Course Name	Prerequisite Type
1763200	SE320 System Analysis And Design	Prerequisite / Study

Tentative List of Topics Covered		
Weeks	Topic	References
Week 1	Course outline and introduction to Software Engineering, Design, and Problem Solving	<b>Chapter 1 &amp; 2</b> From <b>Ref #1</b>
Weeks 2, 3	Introduction to Concurrency Theory and How it is applied in Java	<b>Chapter 1</b> From <b>Ref #1</b> , <b>Chapter 1</b> From <b>Ref #2</b>
Weeks 4, 5	Principles of Software Architecture (Conceptual Overview, Quality Attributes & Constraints, the 4 + 1 View Model, and Processes & Threads in the Architecture)	<b>Chapter 3</b> From <b>Ref #1</b>
Weeks 6, 7, 8	Patterns and Styles in Software Architecture (Data-Centered Systems (e.g. Blackboard Pattern), Data Flow System (e.g. Pipes-and-Filters), Interactive Systems (e.g. Model-View-Controller), Hierarchical Systems (e.g. Layered), Distributed service Systems (e.g. Client Server, Broker, Web-services, Cloud Computing)	<b>Chapter 4</b> From <b>Ref #1</b>

Week 8	How to architect and design practical problems: step-by-step from the problem statement until reaching the coding stage	From Ref #2
Week 9	Principles of Detailed Design (Single responsibility principle, OpenClosed Principle, Liskov Substitution Principle, Interface-Segregation Principle, and Dependency-Inversion Principle)	Chapter 5 From Ref #1
Weeks 9, 10	Creational Design Patterns (such as Abstract Factory, Factory Method, Builder, Prototype, Singleton, and others)	Chapter 6 From Ref #1, From Ref #3
Weeks 11, 12	Structural Design Patterns (such as Adapter, Composite, Facade, and others)	Chapter 7 From Ref #1, From Ref #3
Weeks 13, 14	Behavioral Design Patterns (such as Strategy and Observer, and others)	Chapter 7 From Ref #1, From Ref #3
Week 15	Review	

Mapping of Course Outcomes to Program Student Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Being able to explain software design with respect to software engineering concepts and principles (with a focus on problem-solving and concurrency). The students will apply learned concepts in the lab and via the course project. [1C2]	30%	
Being able to explain and apply the software architecture design patterns, object-oriented principles, and quality attributes. The students will apply learned concepts in the lab and via the course project. [1C6]	10%	
Being able to explain and apply internal detailed design patterns (i.e. creational, structural, and behavioral patterns) and SOLID principles using modelling and programming. The students will apply learned concepts in the lab and via the course project. [1C5]	60%	

Relationship to Program Student Outcomes (Out of 100%)																								
SM1p	SM2p	SM3p	EA1p	EA2p	EA3p	EA4p	D1p	D2p	D3p	D4p	D5p	D6p	ET1p	ET2p	ET3p	ET4p	ET5p	ET6p	EP1p	EP2p	EP3p	EP4p	EP5p	EP6p

Evaluation	
Assessment Tool	Weight
Lab Work	30%
Mid Exam	20%
Final Exam	50%

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