

Course Title:	Software Architecture
Course Code:	CSE452/1
Program:	Computer science Engineering
Department:	Computer Engineering
Course coordinator:	Dr. Rim Afdhal
Institution:	Private Higher School of Engineers of Gafsa (ESIP)

A. Course Identification

1.	Credit hours: 3 (1.5-0-1.5)		
2. (Course type		
a.	College Department Others		
b.	Fundamental Transversal Optional		
3.	Level/year at which this course is offered: 2.2/3		
4.	4. Pre-requisites for this course (if any): Object-oriented design, Data structures, Data base,		
Pro	Programming languages		

1. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Self- study	Total workload
1	Traditional classroom			
2	Blended	45		
3	E-learning		33	78
4	Distance learning			
5	Other ()		9.1	7 0
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2. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	22.5
2	Laboratory/Studio	22.5
3	Tutorial	-
4	Others (specify)	-
	Total	45



B. Course Objectives and Learning Outcomes

Course Description

This "Software Architecture" course covers the fundamental principles, typology, and key concepts in software architecture. Students will explore modeling styles, architectural styles, and the documentation of software architectures. The course will focus on the use of ADL (Architecture Description Languages) and frameworks like Hibernate for architecture design. Students will gain a solid understanding of data-centric architectures and the principles behind physical and logical architectural styles.

Course Main Objective

By the end of this course, students will be able to:

- ✓ Introduce the concepts of software architecture, including positioning, principles, paradigms, and typology.
- ✓ Define and apply different modeling styles for representing software architecture.
- Explain various architectural styles and their application in system Understand and implement a data-centric approach to software architecture.
- ✓ Manage design challenges and ethical considerations related to software architecture decisions.
- ✓ Design, conduct, analyze, and evaluate projects and experiments addressing software architecture issues.
- ✓ Master the physical and logical architectural styles and their implementation in real-world scenarios.

	CLOs	Aligned PLOs
	Knowledge and Understanding	
21	Introduce the core concepts of software architecture, including	
2.1	positioning, principles, paradigms, and typology.	$\mathbf{D}\mathbf{I} \cap \mathbf{K}2$
2.2	Define the modeling styles.	FLO.K2
2.3	Define Data-centric approach.	
3.1	Explain and compare various architectural styles, including MVC, data-	PLO.K3
5.1	centric, and layered architectures.	
	Skills	
22	Master physical and logical architectural styles and their relevance in	PLOS2
2.2	software design.	1 LO.52
2.4	Design, conduct, analyze, and evaluate practices, projects, and	PLO.S4
	experiments related to software architecture issues.	120.01
2.5	Manage design challenges and ethical issues in the context of software	PLO.S5
	architecture.	

1. Course Learning Outcomes



C. Course Content

No	List of Topics	Contact Hours		
1	Introduction to the software architecture: positioning, principles, paradigms, and typology of software architectures.	2		
2	Representation of software architectures: modeling styles	2		
3	The 1+4 view model (semi-formal), The trilogy model (formal)	2		
4	Representation of Software Architecture with UML	3		
5	Architectural styles	3		
6	Physical and logical architectural styles	2		
7	Data-centric approach	2		
8	MVC architecture	2		
9	Documentation of ADL software architectures	3		
10	ADL types, wright, Darwin	3		
11	The persistence management	2		
12	Architecture with persistence	2		
13	Component-based architecture	2		
	Total 30			

C.1 Practical work Content

No	List of Topics	Contact Hours
1	Diagrams of packages and components	2
2	Diagrams of deployments and sequences	2
3	Architectural styles	3
4	1-tier data-centric architecture	3
5	ADL wright	3
6	ADL Darwin	2
	Total	15

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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		
PLO.K2	 ✓ Introduce the core concepts of software architecture, including positioning, principles, paradigms, and typology. ✓ Define the modeling styles. ✓ Define Data-centric approach. 	Lecturing	Assignments, Quizzes , Exams,
PLO.K3	Explain and compare various architectural styles, including MVC, data-centric, and layered architectures.		
2.0	Skills		
PLO.S2	✓ Master physical and logical architectural styles and their relevance in software design.		
PLO.S4	✓ Design, conduct, analyze, and evaluate practices, projects, and experiments related to software architecture issues.	Lecturing	Assignments, Quizzes , Exams,
PLO.S5	O.S5 ✓ Manage the design problems and ethics related to software architecture.		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Practical Work (written or oral)	Weekly	25%
2	Quizzes, Homework assignments	Random	00%
3	First mid Term	8	25%
4	Final Exam	16	

E. Student Academic Counselling and Support

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

- Office hours
- Blackboard interface



F. Learning Resources and Facilities

1. Learning Resources

8		
Required Textbooks	 Richard N. Taylor, Nenad Medvidović, Eric M. Dashofy – Software Architecture: Foundations, Theory, and Practice, Wiley, 2010. ISBN: 978-0470167748. Ian Gorton – Essential Software Architecture, 2nd Edition, Springer, 2011. ISBN: 978-3642191756 Len Bass, Paul Clements, Rick Kazman – Software Architecture in Practice, 4th Edition, Addison-Wesley, 2021. ISBN: 978-0136886099. 	
Essential References Materials	s Star uml, eclipse	
Electronic Materials	 UML Documentation & Tutorials: (uml.org) Coursera & edX Software Architecture Courses Microsoft Azure & AWS Architecture Documentation 	
Other Learning Materials	NA	

4. Facilities Required

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Work carried	Weekly	20%
2	Prototype realization	Random	30%
3	Final Evaluation		50%

G. Course Quality Evaluation

Item	Resources
Accommodation	ur Oalba
(Classrooms, laboratories, demonstration	classroom board software
rooms/labs, etc.)	
Technology Resources	data sharry
(AV, data show, Smart Board, software, etc.)	uata snow;

H. Specification Approval Data

Council / Committee	Computer Engineering Council



Date

07/02/2024

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