



Arab Academy for Science and Technology & Maritime Transport
 College of Computing and Information Technology
 Department of Software Engineering, Cairo

University/Academy: Arab Academy for Science and Technology & Maritime Transport

Faculty/Institute: College of Computing and Information Technology

Program: Software Engineering / computer Science / Information Systems

Course title	Principles of Software Architecture
Course code	SE393

Form no. (11A) Knowledge and skills matrix for a course

Course content	Week study	Knowledge	Intellectual skills	Professional skills	General skills
Introduction & Basic definitions of SW architecture and the role of SWA	1	<p>K12. Understanding essential facts, concepts, principles and theories relevant to software engineering.</p> <p>K15. Demonstrate strong knowledge of software systems analysis & design, data and Information Management, software project management, and software development models.</p>	<p>I12. Identify attributes, components, relationships, patterns, main ideas, and errors.</p>		<p>G1. Demonstrate the ability to make use of a range of learning resources and to manage one's own learning.</p> <p>G2. Demonstrate skills in group working, team management, time management and organizational skills.</p> <p>G4. Use an appropriate mix of tools and aids in preparing and presenting reports for a range of</p>

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The Architecture Business Cycle	2	K12. Understanding essential facts, concepts, principles and theories relevant to software engineering.	I12. Identify attributes, components, relationships, patterns, main ideas, and errors.	P16. Analyze and documenting the feasibility of various options and comparing solution options using multiple decision criteria	audiences, including management, technical, users, industry or the academic community. G6. Reveal communication skills, public speaking and presentation skills, and delegation, writing skills, oral delivery, and effectively using various media for a variety of audiences.
SWA and SWE a comparison	3	K22. Understand the challenges inherent in the maintenance and evolution of software systems, and the techniques and best practices currently available for dealing with them.	I12. Identify attributes, components, relationships, patterns, main ideas, and errors.	P16. Analyze and documenting the feasibility of various options and comparing solution options using multiple decision criteria	G7. Show the use of general computing facilities.
Evolution towards SWA	4	K15. Demonstrate strong knowledge of software systems analysis & design, data and Information Management, software project management, and software development models. K22. Understand the challenges inherent in the maintenance and evolution of software systems, and the techniques and best practices currently available for dealing with them.	I12. Identify attributes, components, relationships, patterns, main ideas, and errors.	P16. Analyze and documenting the feasibility of various options and comparing solution options using multiple decision criteria	G1. Demonstrate the ability to make use of a range of learning resources and to manage one's own learning. G2. Demonstrate skills in group working, team management, time management and organizational skills. G4. Use an appropriate mix of tools and aids in preparing and presenting reports for a range of audiences, including

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					management, technical, users, industry or the academic community.
A view Arch. Styles	5	K15. Demonstrate strong knowledge of software systems analysis & design, data and Information Management, software project management, and software development models.		P16. Analyze and documenting the feasibility of various options and comparing solution options using multiple decision criteria	G6. Reveal communication skills, public speaking and presentation skills, and delegation, writing skills, oral delivery, and effectively using various media for a variety of audiences.
Arch. Styles pros & cons & illustrative implementation examples	6	K15. Demonstrate strong knowledge of software systems analysis & design, data and Information Management, software project management, and software development models.	Select the suitable tools, methods and techniques for modeling, analyzing software, establishing criteria, and verify solutions.	P16. Analyze and documenting the feasibility of various options and comparing solution options using multiple decision criteria	G7. Show the use of general computing facilities.
7 th week Exam	7				
Software Architecture in Practice	8	K12. Understanding essential facts, concepts, principles and theories relevant to software engineering.	Select the suitable tools, methods and techniques for modeling, analyzing software, establishing criteria, and verify solutions.	Maintaining existing software systems Deploy effectively the tools used for the construction and documentation of software, with particular emphasis on	

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				understanding the whole process involved in using computers to solve practical problems.	
Architectural pattern, reference model & A reference architecture the way to SWA Why Is Software Architecture Important? Earliest Set of Design Decisions. System Architecture versus Software Architecture	9	K12. Understanding essential facts, concepts, principles and theories relevant to software engineering.	Select the suitable tools, methods and techniques for modeling, analyzing software, establishing criteria, and verify solutions.	Maintaining existing software systems Deploy effectively the tools used for the construction and documentation of software, with particular emphasis on understanding the whole process involved in using computers to solve practical problems.	G1. Demonstrate the ability to make use of a range of learning resources and to manage one's own learning. G2. Demonstrate skills in group working, team management, time management and organizational skills. G4. Use an appropriate mix of tools and aids in preparing and presenting reports for a range of audiences, including management, technical, users, industry or the academic community.
Architectural Structures and Views, Module structures. Component-and-connector structures. Allocation structures.	10	K12. Understanding essential facts, concepts, principles and theories relevant to software engineering.	Select the suitable tools, methods and techniques for modeling, analyzing software, establishing criteria, and verify solutions.	Maintaining existing software systems Deploy effectively the tools used for the construction and documentation of software, with particular emphasis on understanding the whole process involved in using computers to solve practical problems.	G6. Reveal communication skills, public speaking and presentation skills, and delegation, writing skills, oral delivery, and

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Understanding Quality Attributes. Architecture and Quality Attributes	11	K12. Understanding essential facts, concepts, principles and theories relevant to software engineering. Show a critical understanding of the broad context within software engineering including issues such as quality, reliability.	Perform problem analysis from written descriptions; derive requirements specifications from an understanding of problems (analysis, synthesis).	Deploy effectively the tools used for the construction and documentation of software, with particular emphasis on understanding the whole process involved in using computers to solve practical problems.	effectively using various media for a variety of audiences. G7. Show the use of general computing facilities.
12 th week Exam	12				
Quality attribute scenario	13	K15. Demonstrate strong knowledge of software systems analysis & design, data and Information Management, software project management, and software development models. Show a critical understanding of the broad context within software engineering including issues such as quality, reliability. K19. Perform specification, analysis, design, implementation and	Perform problem analysis from written descriptions; derive requirements specifications from an understanding of problems (analysis, synthesis).	Deploy effectively the tools used for the construction and documentation of software, with particular emphasis on understanding the whole process involved in using computers to solve practical problems.	G1. Demonstrate the ability to make use of a range of learning resources and to manage one's own learning. G2. Demonstrate skills in group working, team management, time management and organizational skills. G4. Use an appropriate mix of tools and aids in preparing and presenting reports for a range of audiences, including management, technical, users, industry or the

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		testing of software solutions.			academic community. G6. Reveal communication skills, public speaking and presentation skills, and delegation, writing skills, oral delivery, and effectively using various media for a variety of audiences.
Designing Architecture (Garage Door Opener Example)	14	K15. Demonstrate strong knowledge of software systems analysis & design, data and Information Management, software project management, and software development models. K19. Perform specification, analysis, design, implementation and testing of software solutions.	Perform problem analysis from written descriptions; derive requirements specifications from an understanding of problems (analysis, synthesis).	Deploy effectively the tools used for the construction and documentation of software, with particular emphasis on understanding the whole process involved in using computers to solve practical problems.	G7. Show the use of general computing facilities.
Projects presentations and discussions	15		Perform problem analysis from written descriptions; derive requirements specifications from an understanding of problems (analysis, synthesis).	Deploy effectively the tools used for the construction and documentation of software, with particular emphasis on understanding the whole process involved in using computers to solve practical problems.	

Course Instructor:

Head of Department:

Program Manager: