



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

Faculty/Institute: College of Computing and Information Technology

Program: Software Engineering

Course title	Formal Methods in Software Engineering
Course code	SE494

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

Course content	Week study	Knowledge	Intellectual skills	Professional skills	General skills
Introduction to formal methods	1	What are formal methods? When are they useful? How can we use formal methods?	I10	P10 P17 P18	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. G3. Show the use of information-retrieval.
Why use formal methods	2	The pros and cons of using formal method	I10 I12.	P10 P17 P18	
Formal methods and project management	3	Work in stages, gathering Requirements, and validating formal specifications.	I10	P10 P17 P18	

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The Z method	4	Introduce the z method in formal methods	I10	P10 P17 P18	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. G3. Show the use of information-retrieval.
From prose to Z, control console	5	Informal requirements, data flow diagram State transition diagram and state transition table	I10 I15.	P10 P17 P18	
Schemas: Text Editor	6	Basic types and abbreviation definitions, Axiomatic descriptions, state schemas and operation schemas	I10	P10 P17 P18	
7 th week Exam	7				
Elements	8	Sets and types, declarations, and variables. Expressions and operators Predicates, equations, and laws	I10 I15.	P10 P17 P18	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. G3. Show the use of information-retrieval.
Structure	9	Tuples and records, Relations, tables and databases, pairs and binary relations	I10	P10 P17 P18	

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Logic	10	Basic predicates, relations as predicates, Logical connectives	I10 I15.	P10 P17 P18 P13	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. G3. Show the use of information-retrieval.
Schema Types and Bindings	11	Using schema types and binding	I10 I12. I15.	P13 P10 P17 P18	
12 th project	12				
Formal Reasoning	13	Calculation and proof, laws, checking specifications, and Precondition calculation	I10	P13 P10 P17 P18	
Modeling Large Systems	14	Subsystems, conditions, and modes.	I12. I15.	P13 P10 P17 P18	
Revision	15			P13	

Course Instructor:

Head of Department:

Program Manager: