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

SE420 Formal Methods In Software Engineering
Second Semester 2024-2025

Course Catalog
3 Credit Hours. This course introduces the use of formal mathematical notation and reasoning in the software development process. These methods have applications in requirements specification, design and verification. Course topics include automata theory, finite state automata, pushdown automata, Turing machines, regular languages, context free languages, types of formal models, and the strengths and limitations of formal methods. Prerequisites Courses: Discrete Math, Any High Level Language, Data Structures
Teaching Method: Blended

Text Book	
Title	Introduction to the Theory of Computation,
Author(s)	Michael Sipser,
Edition	2nd Edition
Short Name	1
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
2	Logic in Computer Science: Modeling and reasoning about systems,	M R A Huth & M D Ryan,	2nd Edition	

Instructor	
Name	**Prof. Mohammad Malkawi**
Office Location	CH-1
Office Hours	Sun : 11:00 - 13:00 Tue : 10:00 - 13:00 Wed : 14:00 - 15:00 Thu : 11:00 - 13:00
Email	mimalkawi@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Tue, Thu : 18:00 - 19:00 Room: متزامن الحضور منصة الكترونية

Prerequisites		
Line Number	**Course Name**	**Prerequisite Type**
1763210	SE321 Software Requirements Engineering	Prerequisite / Study
822411	HSS241MATH Discrete Mathematics	Prerequisite / Study
902411	MATH241 Discrete Mathematics	Prerequisite / Study

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Week 1	? Introduction to Formal Methods in Software Engineering	From **1**
Weeks 2, 3	? Introduction to Formal Languages and Grammars	From **1**, From **2**
Weeks 4, 5	? Introduction to Formal Languages and Grammars	From **1**, From **2**
Weeks 6, 7, 8, 9	? Deterministic and Nondeterministic Finite State Automata	From **1**, From **2**
Weeks 10, 11, 12, 13	? Pushdown Automata and Context Free Languages	
Weeks 14, 15, 16	? Turing Machines Automat	

Mapping of Course Outcomes to Program Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Understand the mathematical and theoretical foundation of software engineering and computer science	30%	Exam 1, Exam 2, Final, Quizzes and Interactive Videos
Enable the students to understand the foundations of software engineering using Automat theory and predicate calculus	40%	Exam 1, Exam 2, Final, Quizzes and Interactive Videos
Understand the basic engineering principles such as automata theory behind software engineering	40%	Exam 1, Exam 2, Final, Quizzes and Interactive Videos

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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**
Exam 1	20%
Exam 2	20%
Final	40%
Quizzes and Interactive Videos	20%

Policy	
Academic Honesty	You are responsible for making yourself aware of the policies and procedures in the Undergraduate Catalog that pertain to Academic Integrity. These policies include cheating, fabrication, falsification and forgery, multiple submission, plagiarism, complicity and computer misuse.
Homework	Late work will not be accepted. All work has to be done independently.
Exams	Makeup exam should not be given unless there is a valid excuse accepted by the university policies.
Attendance	? If you miss a class, it is your responsibility to find out about any announcements, quizzes, or assignments you may have missed. ? You are responsible for any lecture?s material covered in the class. You are encouraged to attend and take your own notes. ? University policies will be applied regarding attendance (check the Undergraduate Catalog ?student book?). ? Your attendance/absence is updated weekly into your student account.

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