MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	**Computation Theory**		**Module Delivery**	
Module Type	Core		☒ Theory	
Module Code	**CS205**		☒ Lecture	
ECTS Credits	**5**		☐ Lab	
SWL (hr/sem)	**125**		☐ Tutorial	
			☐ Practical	
			☐ Seminar	
Module Level	2	**Semester of Delivery**		2
Administering Department	Computer Science dept.	**College**	College of computer science and information technology	
Module Leader	Name	**e-mail**	E-mail	
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)	**e-mail**	E-mail	
Peer Reviewer Name	Name	**e-mail**	E-mail	
Scientific Committee Approval Date	/06/2023	**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

	Module Aims, Learning Outcomes and Indicative Contents
	أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	The aim of this course is to introduce students to the fundamental area of computer science which enables students to focus on the study of abstract models of computation. These abstract models allow the students to assess via formal reasoning what could be achieved through computing when they are using it to solve problems in science and engineering. The goal is to allow them to answer fundamental questions about problems, such as whether they can or not be computed. The course introduces basic computation models and their properties. The students will be able to express computer science problems as mathematical statements and to formulate proofs.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A- Knowledge and understanding : - Clarifying the basic concepts in computational theory through a set of tools. -Gaining skills in problem-solving. -Acquisition of basic skills as an introduction to building languages. -Acquisition of theoretical concepts to deal with RE's, DFA's, NFA's, Stack's, Turing machines, and Grammars. B- Subject-specific skills : B1 - The ability to design (FAs, NFAs, Grammar, languages modelling, small compilers basics). B2 - The ability to think about solving the problem according to specific rules. B3 - Writing scientific reports B4 - Know the comparison between (Natural and Formal Languages).
Indicative Contents المحتويات الإرشادية	- In theoretical computer science, the theory of computation is the branch that deals with whether and how efficiently problems can be solved on a model of computation, using an algorithm. The field is divided into three major branches: automata theory, computability theory and computational complexity theory . - The main purpose of the theory of computation is to develop a formal mathematical model of computation that reflects the real world. computers. - The student can read about these basic topics in order to guide him in the subject of computational theory. These topics are: (Theory of computation, Language Concepts, Grammar Concepts, Finite State Machine, Deterministic finite automaton, Non-

	deterministic Finite State Machine, Regular Languages, Regular Expression, pumping Lemma, Context Free Grammar, FSM Summary, Context-Free Languages, Ambiguity).

Learning and Teaching Strategies	
استراتيجيات التعلم والتعليم	
Strategies	- Readings, self-learning, panel discussions. - Classroom exercises and activities. - Guiding students to some websites to benefit from them to develop abilities. - Holding research seminars through which some problems are explained and analyzed and the mechanism for finding solutions. Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)			
الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	80	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	45	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		