

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	AI-NAHRAIN UNIVERSITY/COLLEGE of SCIENCE
2. University Department	Department of Computer Science
3. Course title/code	Computation Theory I
4. Programme(s) to which it contributes	B.sc Computer Science
5. Modes of Attendance offered	Full Time
6. Semester/Year	First Semester/ 2022-2023
7. Number of hours tuition (total)	30 theory + 15 Tutorial
8. Date of production/revision of this specification	2022-2023
9. Aims of the Course	To introduce the Mathematical foundation in computation theory, formal languages and

the theoretical background in algorithm design and problem solving.

10· Learning Outcomes, Teaching ,Learning and Assessment Methods

A- Knowledge and Understanding

- A1. Understand the Formal language theory as the base for all computer programming languages
- A2. Understand that automata theory is a base for compiler design
- A3. Understand that the automata theory is a base of many computer science model
- A4. Understand that automata theory especially Turing machine give the basic understanding of computers and computer algorithm

B. Subject-specific skills

- B1. Understand the relation between formal grammars and automata
- B2. A clear understanding of the theory concepts such as regular expression deterministic and non-deterministic , push down automata etc. and the relation between them.
- B3. Have clear understanding of minimizing grammars and automata

C. Thinking Skills

- C1. Think how to minimize grammars and automata in procedural form
- C2. Think how to prove that many computational problem

can be formulated using computational principles

C3. Think how to remove the ambiguity from the program statement he/ she designs or wrote.

C4. Think how to move and across difficulty in solving problem

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Understand how to transfer theoretical models from form to another

D2. Understand how to transfer problem from its .theoretical origin into model for computing application

D3. Understand how to analyses and simplifying a problem to be solvable and easy to be solved.

Teaching and Learning Methods

A mixture of normal lectures, homework assignment and self-reading.

Assessment methods

60% for the formal final writing exam

25% for mid-term formal written exam

10% Quizzes and class discussion and oral answering questions

5% for homework exercises

Course Structure .11

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	Necessary mathematical review	Mathematical preliminaries	Normal lectures and solving examples	Quizzes and asking ideas about lecture material
1	3	Introducing formal languages	Basic definition of formal languages and formal grammars	=	=
1	3	Description of all formal languages	Chomsky Hierarchy of formal languages	=	=
1	15	Regular languages and representation by different models	Regular and languages and regular grammar	=	=
2			Regular expression	=	=
2			Finite State automaton deterministic and non-	=	=

			deterministic		
2	6	Algorithm for operation on regular languages	Decision algorithms on regular set	=	=
2	6	Properties of regular languages	Regular closure properties of regular sets	=	=
2	6	A model for a simple computer with output	Finite state automata with output	=	=

12. Infrastructure	
Required reading: <ul style="list-style-type: none"> · CORE TEXTS · COURSE MATERIALS · OTHER 	Well-chosen text book only
Special requirements (include for example workshops, periodicals, IT software, websites)	No special requirement need

Community-based facilities
(include for example, guest
Lectures , internship , field
studies)

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