COURSE SPECIFICATION

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	Al-Khwarizmi College of Engineering
2. University Department/Centre	Automated Manufacturing Department
3. Course title/code	Mechatronics Application / AME423
4. Programme(s) to which it contributes	Automated Manufacturing Engineering
5. Modes of Attendance offered	
6. Semester/Year	Semester
7. Number of hours tuition (total)	4 hours
8. Date of production/revision of this specification	April 2022
9. Aims of the Course	
To expose students with the fundamental issues related to the mechatronics systems. The course covers the industrial manipulators robots. Students will be able to learn the actuators, sensors, and industrial mechatronics system.	

10· Learning Outcomes, Teaching ,Learning and Assessment Methode

A- Knowledge and Understanding
A1.√
A2.
A3.
A4.√
A5.
A6 .

B. Subject-specific skills
B1.
B2.√
B3.
B4
B5
B6 √

Teaching and Learning Methods

Lectures with tutorials and lab.

Assessment methods

Monthly exams, quiz, homework, and experiment of lab.

C. Thinking Skills
C1.
C2.√
C3.√
C4.

Teaching and Learning Methods

Lectures with tutorials and lab.

Assessment methods

Monthly exams, quiz, homework, and experiment of lab.

D. General and Transferable Skills (other skills relevant to employability and personal development)
D1.
D2.
D3.
D4.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2		Introduction: Mechatronics system	Lecture	
1	2		**MATLAB Basic**	Lab.	
2	2		Mechanisms for Motion Transmission (Rotary To Rotary Motion Transmission Mechanisms) (Rotary To Translational Motion Transmission Mechanisms)	Lecture	
2	2		**MATLAB Simulink: modeling system**	Lab.	
3	2		Mechanisms for Motion Transmission (Cyclic Motion Transmission Mechanisms) (Shaft Misalignments And Flexible Couplings)	Lecture	
3	2		**Building model code of CYCLIC MOTION TRANSMISSION MECHANISMS using MATLAB**	Lab.	
4	2		Exam 1	Lecture	
4	2		**Building model SIMULINK of CYCLIC MOTION TRANSMISSION MECHANISMS using MATLAB**	Lab.	
5	2		Actuator sizing	Lecture	
5	2		MATRICES and GUI	Lab.	
	2			Lecture	

6			Homogeneous Transformation Matrices		
6	2		**Building model code of Homogeneous Transformation Matrices via GUI MATLAB**	Lab.	
7	2		Jacobian and torque calculations of Robots	Lecture	
7	2		**Building model code of robot manipulator via GUI MATLAB**	Lab.	
8	2		Tutorial 1	Lecture	
8	2		PC interfacing: Arduino and MATLAB code	Lab.	
9	2		Exam 2	Lecture	
9	2		PC interfacing: Arduino and MATLAB Simulink	Lab.	
10	2		Sensors: position, velocity, acceleration	Lecture	
10	2		PC interfacing: reading input signal	Lab.	
11	2		Sensors: force, torque, strain, pressure,	Lecture	
11	2		PC interfacing: reading sensors	Lab.	
12	2		Electric Actuators: Motor And Drive Technology	Lecture	
12	2		PC interfacing: DC-motor	Lab.	
13	2		Tutorial 2	Lecture	
13	2		PC interfacing: stepper-motor	Lab.	
14	2		REVIEW	Lecture	
14	2		REVIEW	Lab.	
15	2		EXAM 3	Lecture	
15	2		FINAL EXAM	Lab.	

12. Infrastructure

Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	**MECHATRONICS with Experiments** **SABRI CETINKUNT**

Special requirements (include for example workshops, periodicals, IT software, websites)	**IEEE/ASME Transactions on Mechatronics**
Community-based facilities (include for example, guest Lectures , internship , field studies)	**http://ctms.engin.umich.edu/CTMS/index .php?aux=Home**

13. Admissions Developing the lab. With advance mechatronics systems	
Pre-requisites	
Minimum number of students	
Maximum number of students	