



**Jordan University of Science and Technology**  
**Faculty of Engineering**  
**Mechanical Engineering Department**

ME778 Sensors And Actuators - JNQF Level: 6

First Semester 2024-2025

**Course Catalog**

3 Credit Hours. This course introduces sensors and actuators used in electromechanical, computer controlled machines and devices. Topics operating principles, design considerations, and applications of analog sensors, digital transducers, stepper motors, continuous-drive actuators, and drive system electronics. Component integration and design considerations are studied through examples selected from applications of machine tools, mechatronics, precision machines, robotics, aerospace systems, and ground and underwater vehicles.

**Teaching Method:** On Campus

**Text Book**

<b>Title</b>	Sensors, Actuators, and their Interfaces
<b>Author(s)</b>	Nathan Ida
<b>Edition</b>	2nd Edition
<b>Short Name</b>	TextBook
<b>Other Information</b>	ISBN 978-1-61353-006-1 (hardback) 2017.

**Course References**

Short name	Book name	Author(s)	Edition	Other Information
Ref #1	Lecture Notes	Course Instructure	1st Edition	

**Instructor**

Name	Dr. AHMAD ALSHORMAN
Office Location	C5-L1 Office 4
Office Hours	Sun : 10:30 - 12:30 Mon : 09:00 - 11:00 Wed : 13:30 - 14:30 Thu : 10:00 - 11:00
Email	amalshorman6@just.edu.jo

<b>Class Schedule &amp; Room</b>
Section 1: Lecture Time: Mon : 11:00 - 14:00 Room: U

<b>Tentative List of Topics Covered</b>		
<b>Weeks</b>	<b>Topic</b>	<b>References</b>
Week 1	Introduction to Sensors and Actuators and its application in Mechatronics Systems	From <b>TextBook</b> , From <b>Ref #1</b>
Weeks 2, 3	Performance Characteristics of Sensors and Actuators	From <b>TextBook</b> , From <b>Ref #1</b>
Weeks 4, 5	Interfacing Methods and Circuits	From <b>TextBook</b> , From <b>Ref #1</b>
Week 6	Interfacing to Microprocessors	From <b>TextBook</b> , From <b>Ref #1</b>
Weeks 7, 8	Temperature Sensors and Thermal Actuators	From <b>TextBook</b>
Weeks 9, 10	Mechanical Sensors and Actuators	From <b>TextBook</b>
Week 11	Optical Sensors and Actuators	From <b>TextBook</b>
Weeks 12, 13	Electric and Magnetic Sensors and Actuators	From <b>TextBook</b>
Week 14	Acoustic Sensors and Actuators	From <b>TextBook</b>
Weeks 15, 16	MEMS and Smart Sensors	From <b>TextBook</b> , From <b>Ref #1</b>

<b>Mapping of Course Outcomes to Program Outcomes and NQF Outcomes</b>	<b>Course Outcome Weight (Out of 100%)</b>	<b>Assessment method</b>
Explain the operating principles, performance characteristics, and applications of various sensors and actuators, including analog, digital, thermal, mechanical, optical, electric, magnetic, and acoustic. [1L6K1, 1L6K2, 1L6S2]	25%	
Analyze and evaluate sensor and actuator integration in electromechanical and computer-controlled systems, considering interfacing methods and design constraints. [1L6S2, 1L6C3, 1L6C4]	25%	
Develop interfacing circuits and techniques for connecting sensors and actuators to microprocessors in real-world mechatronics systems. [1L6C3, 1L6C4]	25%	
Apply knowledge of advanced sensor technologies, such as MEMS and smart sensors, to solve complex engineering challenges in robotics, aerospace, and precision machinery [1L6C1, 1L6C5]	25%	

Relationship to NQF Outcomes (Out of 100%)						
L6K1	L6K2	L6S2	L6C1	L6C3	L6C4	L6C5
8.33	8.33	16.67	12.5	20.83	20.83	12.5

Date Printed: 2024-11-20