جـامعـة الشـارقـة
UNIVERSITY OF SHARJAH

College of Engineering

Department of Electrical Engineering

Instrumentation and Measurements

Course Description:

The measurement process, errors and sources of errors, signal and noise in instrumentation, filtering, display and recording systems, elements of signal processing in instrumentation, transducers, sensors, micro-processor-based instrumentation systems, data logging, interfaces, and data processing. Conduct sensor-based simulation/experiments.

Course Learning Outcomes:

By the end of successful completion of this course, the student will be able to:

1. Acquire knowledge about the measurement process and performance characteristics
2. Analyze error and noise effects
3. Interpret signal processing techniques to enhance measurements
4. Describe important sensors, transducers, and their technologies as related to measurement of temperature, pressure, flow, force, and motion
5. Design sensor-based electronic circuits for sensing, measurement, and control

Alignment of Course Student Learning Outcomes to Program Student Learning Outcomes

SN	Program SLOs	Course SLOs
(1)	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	- Acquire knowledge about the measurement process and performance characteristics - Analyze error and noise effects - Interpret signal processing techniques to enhance measurements - Describe important sensors, transducers, and their technologies as related to measurement of temperature, pressure, flow, force, and motion - Design sensor-based electronic circuits for sensing, measurement, and control
(2)	An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.	- Design sensor-based electronic circuits for sensing, measurement, and control

SN	Program SLOs	Course SLOs
(2)	An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.	- Analyze digital control systems in time domain - Analyze digital control systems in frequency domain - Perform classical digital controller design - Perform pole assignment design and state estimation on digital control systems - Perform pole assignment design and state estimation on digital control systems
(3)	Communicate effectively with a range of audiences	- Acquire knowledge about the measurement process and performance characteristics - Analyze error and noise effects - Understand signal processing techniques to enhance measurements - Describe important sensors, transducers, and their technologies as related to measurement of temperature, pressure, flow, force, and motion - Design sensor-based electronic circuits for sensing, measurement, and control
(4)	Describe ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	
(5)	Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	- Design sensor-based electronic circuits for sensing, measurement, and control
(6)	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	- Design sensor-based electronic circuits for sensing, measurement, and control
(7)	Apply new knowledge as needed, using appropriate learning strategies	