Faculty of Engineering & Technology

Micro Processor- Based Instrumentaion

Information :

Course Code :	MKT 506	**Level :**	Undergraduate	**Course Hours :**	2.00- Hours

Department : Specialization of Mechatronics Engineering

Area Of Study :

To be familiar with the difference between Instruments and Instrumentation Systems
Develop the students' knowledge about Digital instruments.
Develop studentsôpractical skills for designing and building up a complete application circuit including microprocessors.
To be familiar with the Networks and Communications used for data acquisition in Instrumentation Systems.

Description :

Instruments and Instrumentation Systems (Instruments, Instrumentation of Large Systems, Automation). Digital Basic Instruments (Digital counters, A/D & D/A converters. Digital measuring instruments: digital multi-meters and frequency meters). Microprocessor-Based Instrumentation: (Hardware Architecture, Instruction set and programming, Peripheral Interfacing, Applications in Electro-Mechanical Systems (Case Studies), Networks and Communications in Instrumentation Systems.

Course outcomes :

a.Knowledge and Understanding: :	
1 -	Explain digital counters, frequency meters and digital multi-meters,
2 -	Outline the different components of Instrumentation Systems.
3 -	Recall the hardware and software requirements in dealing with microprocessorbased instrumentation.
4 -	Select the suitable interfaces for each application.
5 -	Select the suitable networks and communications
b.Intellectual Skills: :	
1 -	Prepare a technical report for lab experiments.
2 -	Apply different techniques to solve instrumentation problems
3 -	Design digital measurement systems applying appropriate knowledge and principles.
4 -	Select appropriate solutions for engineering problems based on analytical thinking.
c.Professional and Practical Skills: :	
1 -	Build experiments, and interpret their results using digital measuring instruments and relevant laboratory equipment.
2 -	Apply gained hardware and software skills to the design in diverse mechatronics applications
3 -	Follow up safety requirements at lab.

d.General and Transferable Skills: :	
1 -	Collaborate effectively within multidisciplinary team.
2 -	Demonstrate efficient IT capabilities
3 -	Work coherently and successfully as a part of a team in the Lab and assignments
4 -	Effectively manage tasks, time, and resources during the project and lab experiments.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Instruments and Instrumentation Systems	3	2	1
Digital Basics	3	2	1
Digital Counters	3	2	1
Digital Multi-meters	3	2	1
Microprocessor-Based Instrumentation: Hardware Architecture	3	2	1
Microprocessor-Based Instrumentation: Instruction set	3	2	1
Microprocessor-Based Instrumentation: Peripheral Interfacing,	3	2	1
Applications in Electro-Mechanical Systems (Case Studies)	3	2	1
Applications in Electro-Mechanical Systems (Case Studies)	3	2	1
Applications in Electro-Mechanical Systems (Case Studies)	3	2	1
Applications in Electro-Mechanical Systems (Case Studies)	3	2	1
Networks and Communications in Instrumentation Systems	3	2	1
Networks and Communications in Instrumentation Systems	3	2	1
Networks and Communications in Instrumentation Systems	3	2	1
Networks and Communications in Instrumentation Systems	3	2	1

Teaching And Learning Methodologies :

Interactive Lecturing
Problem solving
Experiential learning

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
1st Misterm	15.00		
2nd Midterm	15.00		

Final Exam	40.00		
In class quizzes	10.00		
LAb experiments and projects	10.00		
PArticipations	10.00		

Course Notes :

Course Notes (in MS Power Point or PDF format)

Recommended books :

Essential Book (Text Book)
ñElectronic Instrumentation & Measurementsò, David A. Bell, - PHI, 2nd Edition, 2003.