



Philadelphia University
Faculty of Engineering
Department of Mechatronics Engineering
Second semester, 2008/2009

Course Syllabus

Course Title: Measurement and Instrumentation	Course code: 610351
Course Level: 4th year	Course prerequisite (s) and/or co requisite (s): Electronic 2
Lecture Time: 12:10-1:10 S,T,F	Credit hours: 3

Academic Staff
Specifics

Name	Rank	Office Number and Location	Office Hours	E-mail Address
Dr Munther N. Baker	Prof.	E713 Department of Mechatronics	9:00-10:00 & 1:00-2:00	munther_baker44@yahoo.co.uk

Course module description:

This course provides an introduction to measurement techniques and instrumentation design and operation.

Course module objectives:

At completing this module the student should know:

- **The basic concept of units, measurement error and accuracy.**
- **The construction and design of measuring devices and circuits.**
- **Introduction to advanced measuring instruments and their applications.**
- **Using different measuring techniques.**
- **Measurement of different physical parameters using different transducers.**

Course/ module components

- **Books (title, author (s), publisher, year of publication)**
Title: Modern Electronic Instrumentation and Measurement Techniques.
Author: Albert D. Helfrick & William D. Cooper
Publisher: Prentice Hall International Inc.

- **Support material (s) (ves, acs, etc).**
- **Study guide (s) (if applicable)**
- **Homework and laboratory guide (s) if (applicable). Provide sheets of home work and discuss the problems with the interested students in tutorial hours.**

Teaching methods:

- 3 Lectures a week
- 1-2 Appointments for tutorials and problem solving after each chapter

Learning outcomes:

- Knowledge and understanding
The theoretical back grounds of measurements and instrumentation.
- Cognitive skills (thinking and analysis).
The use of measuring devices effectively, and analysis results and errors.
- Communication skills (personal and academic). Not applicable
- Practical and subject specific skills (Transferable Skills).
The ability to design some basic measuring devices and the ability to carry out some meaningful measurements.

Assessment instruments

- Short reports and/ or presentations, and/ or Short research projects
- Quizzes.
- Home works
- Final examination: 50 marks

<u>Allocation of Marks</u>	
Assessment Instruments	Mark
First examination	20
Second examination	20
Final examination: 50 marks	50
Reports, research projects, Quizzes, Home works, Projects	20
Total	100

Documentation and academic honesty

- Documentation style (with illustrative examples)
- Protection by copyright
- Avoiding plagiarism.

Course/module academic calendar

week	Basic and support material to be covered	Homework/reports and their due dates
(1)	Introduction to units and SI units system.	
(2)	Fundamental & derived units Multiple and sub multiple units.	Hand out home work sheet no. 1.
(3)	Errors in measurement & types of errors	Quiz no. 1.
(4)	Statistical analysis & probability of errors.	Hand out home work sheet no. 2.
(5)	Electromechanical instruments, Dc ammeters & voltmeters	Quiz no. 2.
(6)	AC ammeters & Voltmeters	Hand out home work sheet no. 3.
(7)	Electrodynamometers in power measurements.	Quiz no.3.
(8)	Bridge DC measurements.	
(9)	Bridge AC measurements.	Hand out home work sheet no. 4.
(10)	Transducers Concepts and types.	Quiz no.4.
(11)	Transducers applications.	
(12)	Transducers applications.	Hand out home work sheet no. 5.
(13)	Oscilloscope principles of operation.	Quiz no. 5

(14)	Oscilloscope applications in measurements.	Hand out home work sheet no. 6.
(15)	Oscilloscope applications	Quiz no. 6.
(16)	Revision and final examination.	

Expected workload:

On average students need to spend 2 hours of study and preparation for each 50-minute lecture/tutorial.

Attendance policy:

Absence from lectures and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant college/faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.

Module references

Books

- Principles of Electronic Instrumentation and Measurement, by Howard M. Berlin & Frank C. Getz
- Elements of Electronic Instrumentation and Measurement, by Joseph J. Carr, Pearson Education.

Journals

Websites

<http://www.amazon.com/Engineering-Fundamentals>.

Start by marking "Modern Electronic Instrumentation and Measurement Techniques" as Want to Read: Want to Read saving...
Want to Read. We'd love your help. Let us know what's wrong with this preview of Modern Electronic Instrumentation and
Measurement Techniques by Helfrick Albert D.. Problem: It's the wrong book It's the wrong edition Other. Book titleIntroduction
to Instrumentation, Sensors and Process Control. Author. William C. Dunn.