



MODULE SPECIFICATION

Faculty of Engineering

Last Updated 29th July 2017

1. Module Title
Measurement and Instrumentation

2. Module Code
EM1501*

3. Number of credits
10

4. Level
1

5. Semester
1

6. Pre-requisites for admission to the module
Normal entry requirements

7. Module Coordinator
Dr Md Gholam Yazdani

8. Aims
This module introduces to the students the concept of measurement in the mechanical engineering context. It also addresses the quality of measurement processes and associated instruments at a level considered essential and highly desirable for Mechanical Engineers.

9. Summary of Contents

The module covers the following topics:

- **Introduction to Measurements:** Basic units and system of units; base units and derived units.
- **Measurement Instruments:** Different types of measuring equipment and its applications. Pressure, temperature, heat, fluid flow, force, displacement, speed, torque, sound, surface roughness and roundness.
- **Data Recording:** Filter and manipulation, transmission & recording of data.
- **Characteristics of Measurement Instrumentation:** Accuracy and precision; reliability and repeatability; threshold; generalized performance and calibration.
- **Data presentation:** Charts, graphs, and data interpretation; error analysis and error bars.

10. Module Intended Learning Outcomes (MILOs)

Upon successful completion of this module, students will be able to:

No.	MILOs	Weightage (%)
1	Explain the principles and characteristics of measuring systems.	20
2	Describe the general performance and characteristic of the measuring equipment.	30
3	Analyse the data by manipulation, transmission & recording.	25
4	Interpret the data using different presentation tools.	25

11. Teaching and Learning Activities (TLAs)

MILO No.	TLAs	Functions	Hours/Week
1-4	Lecture	Present and convey critical information and theories related to measurements and instrumentation	2
1-4	Tutorial	Interactive problem-solving session used for transfer of knowledge by example through a set of instructions to complete a task	1
3-4	Laboratory	To verify the theory by relevant experiments	1

12. Assessment Tasks/Activities

MILO No.	Type of Assessment Tasks/Activities	Weightage (%)
1-4	University Examination	60
3-4	Laboratory Reports (3)	30
4	Assignments (1)	10

Assessment Criteria:

Assessment components of the module shall be University Examination and Coursework. To achieve a pass in the module students must obtain a minimum overall mark of 40% and a minimum of 30% in each assessment component.

Reassessment: Students eligible for reassessment shall be assessed according to the programme area examination board recommendation.

13. Attendance Requirements

Students are required to attend all lectures, tutorials and laboratory sessions.

14. Contribution to Programme Intended Learning Outcomes

PILO No.		MILO No.			
		1	2	3	4
1	Science & Mathematics	✓	✓	✓	✓
2	Engineering Analysis	✓	✓	✓	✓
3	Design				
4	Advanced Design				
5	Economic, Legal, Social and Ethical Contexts		✓		✓
6	Engineering Practice			✓	✓
7	General Skills			✓	✓

15. Grading of Student Achievement

Marks (%)	Grades	Grade Definition
85-100	A+	Excellent
75-84	A	
70-74	B+	Very Good
65-69	B	
60-64	C+	Good
55-59	C	
50-54	D+	Satisfactory
45-49	D	
40-44	E	Marginal
0-39	F	Fail

16. Resources

Primary text

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher's Name	ISBN
1	Richard S. Figliola and Donald E. Beasley	2014	Theory and Design for Mechanical Measurements	6 th	John Wiley & Sons, Inc.	10987654321

Secondary text

No	Name of Author(s)	Year of Publication	Title of Book	Edition	Publisher's Name	ISBN
1	R.K. Rajput	2009	Mechanical Measurements & Instrumentation	5 th	S. K. Kataria & Sons,	818845883X

Note: Module specification valid for BEng Mechanical Engineering Intake 09 onwards.