Seoul National University of
Science & Technology
232 Gongneung-ro,Nowon-gu,
Seoul 01811 Korea

MSDE Module Descriptor

Module Title Mechanical Engineering Systems Laboratory	**Module Code** MSDE 328	**Semester (Sem 1 / Sem 2)** Sem 2
Credits 10	**Level** 5	**Professor and email** Dong-Young JANG dyjang@seoultech.ac.kr
Delivery Method Tutorial, Laboratory	**Delivery Location** SeoulTech, Mugung Hall	

Module Synopsis

This module provides mechanical experimental laboratories. Knowledge and characteristics are investigated on mechanical behaviour such as stress/strain and bending, thermal system behaviour such as heat transfer and heat pump, fluid flows, and mechanical vibrations are delivered.

Outline Syllabus

Overview on the mechanical experiment
Introduction of laboratory, Safety education, General experimental procedures, Calibration, Uncertainty analysis by using probability and statistics. Practice on strain gage usage

Advanced material test laboratory
Tensile/Compression, Stress/strain measurement, Poisson ratio test, Principal stress/strain measurements, Bending test

Mechanical vibration test
Cantilever impact test, balancing test, mode shape/natural frequency measurement

Fluid flow test
Bernoulli's equation test, Fluid pressure measurement, Wind tunnel test, Reynold’s number measurement

Thermal property test
Heat exchanger test, Temperature measurement

Indicative Reading:

1) Theory and Design for Mechanical Measurements, R. S. Figliola, 3rd ed., John Wiley & Sons, 2000
2) Applied Measurement Engineering, C. P. Wright, Prentice Hall, 1994
3) Introduction to Mechatonics and Measurement Systems 2nd edition, D. Alciatore, McGraw-Hill, 2002

NOTIONAL STUDENT WORKLOAD	**Hours**
MODE OF DELIVERY (FT / PT / DL)	FT
Lectures	20
Seminars	
Tutorials	
Laboratories/studios/practical	50
Directed learning	5
Independent Learning	25
Work experience/fieldwork	
Other: eg formal presentation	
Total Workload 100 hours for a 10 credit module 200 hours for a 20 credit module	100

Module Outcomes	
KU1,2,3	KU1. Evaluate and apply complex knowledge of the scientific and mathematical principles of engineering to solve Real-World problems. KU2. Perform advanced analysis of unfamiliar engineering systems. KU3. Introduce and utilise complex methodologies to create solutions to a variety of Real-World engineering problems.
IPSA1	IPSA1. Apply advanced approaches to solving unfamiliar real world engineering problems.
PVA1,2	PVA1. Describe, with justification, solutions to benefit society by applying structured engineering practise with a deep awareness of ethical considerations. PVA2. Critically analyse advanced solutions to complex engineering problems.

Assessments	Assessment Type	Weighting %	Midterm/interim/final
Course Work	Laboratory (continuous Assessment)	70	
Course Work	Final Report/ Presentation	30	Final
Quiz			
Test			
Laboratory			
Exam			
Presentation			