Course Number	ME 73 (2nd Sem AY 2016-2017)	**Instructor**	Ervin S. Santos
Course Title	Mechanical Measurements and Instrumentation	**Consultation Hours**	M 3:00-5:00PM WF 1:00-5:00PM
Course Credit	3 u. 5 h (2 h lec, 3 lab)	**Contact Number**	09178110921
Class Schedule	MBC M 8:00-10:00 AM MDE M 10:00AM-12:00PM MIJ M 1:00-3:00PM	**E-mail Address**	ervinsantos2@gmail.com

Course Description:

Fundamentals of mechanical measurements. Design and execution of experiments; statistical analysis and analysis of experimental data. Calibration of measuring instruments.

Course Goals:

1. Learn how to design and conduct experiments that will yield reliable data.
2. Apply statistical methods in determining the uncertainty of data obtained from experiments.
3. Conduct experiments in a laboratory environment.
4. Enhance skills in presenting data and writing technical reports.

References:

1. Messersmith, .Mechanical engineering Laboratory
2. Beckwith, T. G., Marangoni, R.D., Lienhard V, J. H., Mechanical Measurements. 5th ed. Addison-Wesley

Schedule	Course Objective	Lecture Topic	Lab Activity
Week 1	• Be familiar with the course and get to know the members of the class.	• Course Introduction and Orientation	
Week 2	• Discuss the fundamentals of measurement and be familiar with the different standards.	• Fundamentals of Measurement • The Process of Measurement • Standards and Dimensional Units of Measurement	• Open discussion • Lab exercise
Week 3	• Identify methods on processing and reporting experimental data. Practice and enhance skills on paper writing.	• Processing and Reporting Experimental Data • Basic Report Writing	• Experiment • Report Writing
Week 4	• Be familiar with pressure gauges and how to use and calibrate them.	• Pressure Measurement	• Experiment • Report Writing
Week 5	• Be familiar with temperature measurement devices and how to use them.	• Temperature Measurement	• Experiment • Report Writing
Week 6	• Be familiar with a rotameter and other flow measurement devices and how to use them.	• Flow Measurement	• Experiment • Report Writing
Week 7	• Be familiar with the bomb calorimeter and how it operates.	• Heating Value of Fuels	• Experiment • Report Writing

Week 8	• Be familiar with an internal combustion engine and how it works	• Internal Combustion Engines	• Experiment • Report Writing
Week 9	• Be familiar with the UP-VRTL engine and chassis dynamometer and other methods of power measurement.	• Power Measurement	• Experiment • Report Writing
Week 10	• Be familiar with the UTM and its possible applications. Discuss some standards that apply to different UTM tests.	• Universal Testing Machine*	• Experiment • Report Writing
Week 11	• Be familiar with the stroboscope and other ways of measuring frequency.	• Angular Velocity*	• Experiment • Report Writing
Week 12	• Be familiar with wind tunnels and its possible applications.	• Aerodynamics*	• Experiment • Report Writing

*additional topics and may be omitted depending on time constraints

Evaluation and Grading Criteria

Course Requirements:

Oral Reports/Presentations	20%
Laboratory Performance	10%
Laboratory Reports	30%
Project	20%
Final Exam	20%

Grading System

RG	Grade	RG	Grade
93 and higher	1.0	69 to below 73	2.5
89 to below 93	1.25	65 to below 69	2.75
85 to below 89	1.5	60 to below 65	3
81 to below 85	1.75	55 to below 60	4
77 to below 81	2.0	Lower than 55	5
73 to below 77	2.25		