

 <p>UNIVERSITI TEKNIKAL MALAYSIA MELAKA اونيويرستي تېكنيكل مليسيا ملاك UNIVERSITI TEKNIKAL MALAYSIA MELAKA</p>	<p><b>TEACHING PLAN</b> <b>UNIVERSITI TEKNIKAL MALAYSIA MELAKA</b> <b>FAKULTI KEJURUTERAAN MEKANIKAL</b></p>	
<p><b>MECHANICAL ENGINEERING LABORATORY II</b></p>		
<p><b>BMCG 2011</b></p>	<p><b>SEMESTER 2</b></p>	<p><b>SESI 2019/2020</b></p>

## 1.0 OBJECTIVE

The objective of this course is to introduce students to engineering practice in the field of Thermodynamics, Fluid Mechanics and Solid Mechanics.

## 2.0 LEARNING OUTCOMES

At the end of this course, students should be able to:

- LO1** Observe discipline in attending laboratory sessions, applied safety precautions before, during and after conducting experiments in terms of experimental procedures and aware of the general experimental ethics. **(PO10, CS3)**
- LO2** Plan, design and conduct experiments to prove a proposed hypothesis out of a given real and practical engineering problem. **(PO2, C3)**
- LO3** Write a well organised, sensible and readable technical reports. **(PO9, C6)**

## 3.0 SYNOPSIS

Introduction to safety procedures in a laboratory. Hypothesis formulation. Design of experiments. Data analysis. Use of graphical presentation techniques for experimental data. Error and uncertainty. Measurement accuracy and precision. Statistical analysis. Good laboratory report writing.

The experiments will be conducted in mechanical engineering laboratories that study fundamental engineering concepts in Thermodynamics (Boyles law and Refrigeration system), Fluid Mechanics (Impact jets, Fluid friction and Stability of floating body) and Solid Mechanics (Tensile test, Torsion test and Forces in Trusses).

## 4.0 REFERENCES

- a. Wheeler, A.J. and Ganji, A.R., 2010. *Introduction to Engineering Experimentation*, 3<sup>rd</sup> Ed., International Edition Pearson.
- b. Cengel, Y. A. and Boles, M. A..2007. *Thermodynamics: An Engineering Approach*, 6<sup>th</sup> Ed., McGraw Hill.Singapore
- c. Yuan, C.S., 2006, *Fluid Mechanics I*, Pearson Prentice Hall, Malaysia.
- d. Hibbeler, R. C., 2007, *Mechanics of Materials*, 7<sup>th</sup> Ed., Prentice Hall.

## 5.0 COURSE IMPLEMENTATIONS

The detail implementation of this course as below:

- a. Briefing  
2 hours per week for 1 week (Total = 2 hours)
- Discussion and planning (1<sup>ST</sup> week)  
Experiment proposal writing  
2 hours per week for 4 weeks (Total = 8 hours)
- Experiments (2<sup>nd</sup> week)  
2 hours per week for 4 weeks (Total = 8 hours)
- Reflections  
Discussion on the outcomes (2 hours x 1 week)

## 6.0 COURSE INSTRUCTIONS

Attendance is compulsory for all laboratory sessions including briefing and discussion sessions and should be more than 80% of the total contact hours.

## 7.0 COURSE EVALUATIONS

	CRITERIA PER EXPERIMENT	PERCENTAGE (%)
<b>COURSE WORK</b>		
Direct Observation	<ul style="list-style-type: none"><li>• Attendance (x 5%) (wk 1)</li><li>• Team work (x 5%) (wk 2)</li><li>• Communication &amp; Interactions (x 5%) (wk 2)</li></ul>	15
Experiment proposal Report	1 report x 15 %	15
Final Report	1 report x 70 %	70
<b>SUB TOTAL</b>		<b>100</b>
<b>4 experiments x 100</b>		<b>400</b>

# Any report found to be of plagiarism in nature will be given minimum mark of 0%.

## 9.0 ACADEMIC STAFF

### a. Laboratory Session

GROUP	STAFF
K1	Dr. Nur Izyan binti Zulkafli +6010-9216412 nurizyan@utem.edu.my
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Fluid Mechanics Lab	En. Ikhmal Hisham bin Ibrahim @ Ibarahim 06-2332537 / 019-6264559 ikhmal@utem.edu.my