Fall 2019

ME 406-101: Mechanical Laboratory III

Veljko Samardzic

COURSE NUMBER	**ME 406**
COURSE TITLE	**Mechanical Laboratory-III**
COURSE STRUCTURE	(1-2-2) (lecture hr/wk - lab hr/wk – course credits)
COURSE COORDINATOR	V. Samardzic
COURSE DESCRIPTION	An advanced laboratory course for mechanical engineering students. Covers the testing, evaluation and performance of complete mechanical systems.
PREREQUISITE(S)	ME 405 - Mechanical Laboratory II, ME 407 - Heat Transfer
COREQUISITE(S)	None
REQUIRED, ELECTIVE OR SELECTED ELECTIVE	**REQUIRED**
REQUIRED MATERIALS	1. J.P. Holman, Experimental Methods for Engineers, 8th Edition, McGraw-Hill, 2012. 2. Mechanical Laboratory III Manual, ME web-site, 2012.
Other supplemental materials (not Required)	1. F.P. Incropera and D.P. DeWitt, An Introduction to Heat Transfer, 4th Edition, John Wiley and Sons, 2002. 2. Y.A. Cengel and M.A. Boles, Thermodynamics, 5th Edition, McGraw-Hill, 2006.
COMPUTER USAGE	Analysis and acquisition of data, statistical analysis and curve plotting.

COURSE LEARNING OUTCOMES/ EXPECTED PERFORMANCE CRITERIA:

Course Learning Outcomes	SOs*	Expected Performance Criteria
1 **Demonstrate** an ability to conduct experiments in both thermal and mechanical systems	1, 5, 7	**Report** (80% of the students will earn a grade of 70% or better on the reports)
2. **Evaluate** the performance of complete systems	1, 5	**Exam Question** (75% of the students will earn a grade of 70% or better on this question)
3. **Plan** and **execute** at least one system experiment	1,7	**Report** (80% of the students will earn a grade of 70% or better on the report)
4. **Prepare** effective engineering reports with substantial computer usage and graphical content	1, 6, 7	**Report** (80% of the students will earn a grade of 70% or better on the report)

<table>
<tr><td>CLASS TOPICS</td><td colspan="7">1. Internal combustion engine performance.
2. Refrigeration cycles and evaluation of performance.
3. Forced and free convection heat transfer including phase change.
4. Performance of a concentric tube heat exchanger.
5. Dynamics of a vibrating system.
6. Design of an experiment for the purpose of comparing parameters of two refrigeration systems.</td></tr>
<tr><td rowspan="3">STUDENT OUTCOMES (SCALE: 1-3)</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr>
<tr><td>3</td><td></td><td></td><td></td><td>2</td><td>3</td><td>3</td></tr>
<tr><td colspan="7">3 – Strongly supported 2 – Supported 1 – Minimally supported</td></tr>
</table>

* Student Outcomes.