<table>
<tr><td>COURSE NUMBER</td><td>ME 406</td></tr>
<tr><td>COURSE TITLE</td><td>Mechanical Laboratory-III</td></tr>
<tr><td>COURSE STRUCTURE</td><td>(1-2-2) (lecture hr/wk - lab hr/wk – course credits)</td></tr>
<tr><td>COURSE COORDINATOR</td><td>V. Samardzic</td></tr>
<tr><td>COURSE DESCRIPTION</td><td>An advanced laboratory course for mechanical engineering students. Covers the testing, evaluation and performance of complete mechanical systems.</td></tr>
<tr><td>PREREQUISITE(S)</td><td>ME 405 - Mechanical Laboratory II, ME 407 - Heat Transfer</td></tr>
<tr><td>COREQUISITE(S)</td><td>None</td></tr>
<tr><td>REQUIRED, ELECTIVE OR SELECTED ELECTIVE</td><td>REQUIRED</td></tr>
<tr><td>REQUIRED MATERIALS</td><td>1. J.P. Holman, Experimental Methods for Engineers, 8th Edition, McGraw-Hill, 2012.
2. Mechanical Laboratory III Manual, ME web-site, 2012.</td></tr>
<tr><td>Other supplemental materials (not Required)</td><td>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.</td></tr>
<tr><td>COMPUTER USAGE</td><td>Analysis and acquisition of data, statistical analysis and curve plotting.</td></tr>
<tr><td>COURSE LEARNING OUTCOMES/EXPECTED PERFORMANCE CRITERIA:</td><td>
<table>
<tr><th>Course Learning Outcomes</th><th>SOs*</th><th>Expected Performance Criteria</th></tr>
<tr><td>1 Demonstrate an ability to conduct experiments in both thermal and mechanical systems</td><td>1, 5, 7</td><td>Report (80% of the students will earn a grade of 70% or better on the reports)</td></tr>
<tr><td>2. Evaluate the performance of complete systems</td><td>1, 5</td><td>Exam Question (75% of the students will earn a grade of 70% or better on this question)</td></tr>
<tr><td>3. Plan and execute at least one system experiment</td><td>1,7</td><td>Report (80% of the students will earn a grade of 70% or better on the report)</td></tr>
<tr><td>4. Prepare effective engineering reports with substantial computer usage and graphical content</td><td>1, 6, 7</td><td>Report (80% of the students will earn a grade of 70% or better on the report)</td></tr>
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<tr><td>CLASS TOPICS</td><td>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>STUDENT OUTCOMES (SCALE: 1-3)</td><td>
<table>
<tr><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th></tr>
<tr><td>3</td><td></td><td></td><td></td><td>2</td><td>3</td><td>3</td></tr>
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3 – Strongly supported 2 – Supported 1 – Minimally supported
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* Student Outcomes.