

ME 442: Internal Combustion Engines
Fall or Spring Semester Elective

Type (check one):	Required: _____ Elective: <u> ✓ </u>
2005-2006 Catalog Data:	ME 442. Internal Combustion Engines. Principles of spark ignition and compression engines. Both two- and four-stroke engines are considered. Fuel combustion, cooling, and turbocharging effects. Experimental methods of determining engine performance. Guest lecturers and plant tours. Prerequisites ME 306, ME 316. <i>One semester; three credits</i>
Prerequisites:	ME 306, ME 316
Co-Requisites:	None
Textbook:	John Heywood, <i>Internal Combustion Engine Fundamentals</i> , McGraw-Hill, 1 st Edition, 1988
Other Required Materials:	None
Other References:	None
Instructor:	Dr. Joseph M. Londino, Assistant Professor of Mechanical Engineering
Course Objectives:	<ol style="list-style-type: none">1. Develop understanding of thermodynamic analysis of internal combustion engines2. Develop understanding of how thermodynamics, fluid mechanics, heat transfer, and mechanical design are integrated in the design of modern engines
Prerequisites by Topics:	<ol style="list-style-type: none">1. Thermodynamics2. Fluid mechanics3. Heat transfer
Topics:	<ol style="list-style-type: none">1. Basic choices: spark ignition vs. compression ignition2. Air-cycle analysis3. Combustion stoichiometry4. Fuel-air cycle analysis5. Measurement of actual cycles: dynamometers, indicator diagrams6. Computerized cycle simulations7. Engine-related design project8. Guest speakers9. Field trips
Class Schedule:	Three 50-minute sessions per week

Prepared by: Dr. Joseph M. Londino

Date: August 2005

**Professional Component:
ME 442 – Internal Combustion Engines**

Category (check one)	<input type="checkbox"/> Math/Basic Science <input checked="" type="checkbox"/> Engineering <input type="checkbox"/> General Education <input type="checkbox"/> Other
Design (check one)	<input type="checkbox"/> Significant <input checked="" type="checkbox"/> Some <input type="checkbox"/> None
Realistic Constraints (check all that apply)	<input checked="" type="checkbox"/> Economic <input checked="" type="checkbox"/> Environmental <input type="checkbox"/> Sustainability <input type="checkbox"/> Manufacturability <input type="checkbox"/> Ethical <input type="checkbox"/> Health & Safety <input type="checkbox"/> Social <input type="checkbox"/> Political

Relationship to Program Outcomes:

Check all that apply:

- (a) an ability to apply knowledge of mathematics, science, and engineering
- (b) an ability to design and conduct experiments, as well as to analyze and interpret data
- (c) an ability to design a system, component, or process to meet desired needs
- (d) an ability to function on multi-disciplinary teams
- (e) an ability to identify, formulate, and solve engineering problems
- (f) an understanding of professional and ethical responsibility
- (g) an ability to communicate effectively
- (h) the broad education necessary to understand the impact of engineering solutions in a global and societal context
- (i) a recognition of the need for and an ability to engage in life-long learning
- (j) a knowledge of contemporary issues
- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice