COURSE NUMBER: ME 5461, 4 credits	**COURSE TITLE:** Internal Combustion Engines.
TERMS OFFERED: Spring	**PREREQUISITES:** IT or grad student, 3331, 3332 or equiv; SP-IT upper div or grad student, C or better in 3331 and 3332 or #
TEXTBOOKS/REQUIRED MATERIAL: Internal Combustion Engines, by Richard Stone. Supplementary materials distributed during quarter	**PREPARED BY:** D.B. Kittelson **DATE OF PREPARATION:** 06/10/07
COURSE LEADER(S): D.B. Kittelson	**CLASS/LABORATORY SCHEDULE:** Three 50-minute lectures per week One 1-hour lab per week **CONTRIBUTION OF COURSE TO MEETING PROFESSIONAL OBJECTIVES:** 100% Engineering topics
CATALOG DESCRIPTION: Basic spark ignition, diesel, and related engine cycle principles, air, fuel-air and actual engine cycles, cycle modeling, combustion and emissions, autoignition, air flow and volumetric efficiency, mixture requirements, ignition requirements and performance. Lectures and complementary labs.	**COURSE TOPICS**: 1. Introduction 2. Air Cycles 3. Combustion, Fuel Air Cycles 4. Actual Engine Cycles - Combustion, Emissions 5. Friction 6. Air Capacity 7. Mixture Requirements 8. Fuel Systems 9. Ignition 10. Diesel Engines

COURSE OBJECTIVES	1. To teach the basic thermodynamics and fluid mechanics of Otto and Diesel Cycle engines and their modern derivatives. 2. To teach basic engine combustion concepts and how they relate to engine performance and emissions 3. To teach how fueling and ignition requirements of modern engines are met. 4. To teach engineering problem solving and design concepts through examples and assignments 5. To relate basic engine concepts to hands on engine measurements
COURSE OUTCOMES	**(Letters shown in brackets are linked to program outcomes a-k.)** 1. Apply basic thermodynamic conservation laws to non-steady open system [a, e] 2. To apply conservation of mass, energy, and chemical elements to combustion problems [a, e] 3. To understand relationships between combustion and energy consumption and emissions [a, e, h, j] 4. To learn about the design of modern engine management systems [a, c, e] 5. Ability to use engine performance models to do basic design problems [c, e] 6. Ability to describe experimental measurements and relate to basic engine concepts [b, c, e]

ASSESSMENT TOOLS:	1. Regular homework problems 2. Exams 3. Lab reports

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Nature of Changes:

1. ***In the catalog description autoignition has replaced the previous "knock phenomena".***
2. ***Under course topic # 7, Mixture has replaced Fuel Air Ratio, Fuel systems replaced Carburetors & Fuel Injection as course topic #8, and course topic #9 is now "Ignition", rather than Spark Ignition.***