

COURSE NUMBER: Vm458		COURSE TITLE: Automotive Engineering	
CREDIT: 3		PREREQUISITES: Vm350	
TEXTBOOKS/REQUIRED MATERIAL: “R. Stone & J. Ball, “Automotive Engineering Fundamentals,” Published by SAE (ISBN: 978-0-7680-0987-3), 2004		COGNIZANT FACULTY: David Hung DATE OF PREPARATION: Oct 08, 2012 DATE OF UEC APPROVAL: Oct. 30, 2013	
INSTRUCTOR(S): David Hung		SCIENCE/DESIGN: n/a	
CATALOG DESCRIPTION: Introduction to the practice of engineering in the automotive field; systems approach to automotive design; vehicle system, powertrain, driveline, chassis, braking, cooling system, as well as automotive component function, operating, and design principles, and current trends; analytical approach to the engineering problem and performance analysis related to automobile engines which affect engine power, efficiency, emissions, design and operating characteristics.		COURSE TOPICS: 1. Vehicle System Overview and Historical Perspective (3 hrs) 2. Internal Combustion Engine Design and Operations (6 hrs) 3. Automotive Fuels and Emissions (3 hrs) 4. Automotive systems: powertrain, steering, chassis, suspension, cooling, braking, transmission, and vehicle aerodynamics (12.75 hrs) 5. New Energy Vehicle: Electric Vehicle, Hybrids, Fuel Cell Vehicle (3 hrs)	
COURSE STRUCTURE/SCHEDULE: Lecture: 90-minute lectures (Two in odd week and one in even week; total lecture hours = 33.75 hours)			
COURSE OBJECTIVES [Course Outcomes in brackets]	<ol style="list-style-type: none"> To provide the knowledge and experience to understand the basic functions and various sub-systems of vehicles. [1, 2, 3, 4, 5, 6] To provide the knowledge and experience needed to communicate ideas, progress, and results to others in an easy-to-understand and professional manner, and in multiple ways (oral, written, and graphical). [7, 8] To provide experiences working together as a team to accomplish a common goal. [9, 10] 		
COURSE OUTCOMES [Program Outcomes in brackets]	<p>After completing Vm458, students should be able to:</p> <ol style="list-style-type: none"> Understand the overall vehicle architecture, design and integration [a, b, c, e, h, i] Identify engine operation and major subsystems of a vehicle [a, c] Understand automotive fuels, vehicle emissions and their impacts to the environment [f, h, i, j] Gain the historical perspective of vehicle and the automotive industry [a, f, h, i, j] Be able to understand the trends of new energy vehicle development [c, h, i, j] Gain knowledge of identifying computer modeling tools to simulate vehicle performance. [b, k] Use basic equations to calculate engine and vehicle performance [a, b, e, k] Be able to use a variety of industrial and engineering formats to present the results and conclusions of a state-of-the-art automotive team project in a clear, readable, and informative written format [g] Present the technical content of an automotive team project final report in a team-based oral format [g] Work effectively and professionally together in diverse teams [d, f, g] 		
ASSESSMENT TOOLS [Course Outcomes in brackets]	<p>Homework [1,2,3,4,5,6,7] In-class Assignments [1,2,3,4,5,6,7] Exams [1,2,3,4,5,6,7] Written reports [1,2,3,4,5,6,7,8] Oral reports [9] Peer evaluations [10]</p>		