

# Automotive Engineering Design Specialty

Department of Mechanical Engineering



M.E. Automotive students often participate in Kettering's SAE Team. Pictured here are the 2008 SAE team members.

## Objectives of the Automotive Engineering Design Specialty

The basic philosophy behind the Automotive specialty is two fold:

First – To provide students with the fundamental knowledge in the field of Mechanical Engineering and provide them with the tools to be a contributing team member.

Second – To provide the students with basic and introductory knowledge of Automotive engineering in the areas of Powertrain Engineering, Vehicle Performance, Chassis Design, culminating with the experience of the Vehicle Design Project course.

## Is it for Me?

Engineers who are interested in the design, development and manufacturing of automobiles would be particularly interested in this specialty.

Students who decide to enroll in the Automotive specialty gain greater insight into automotive engineering through classes such as Engine Design, Vehicle Performance and Transmission Design, as well as Chassis Design.

Automotive students work closely with the Society of Automotive Engineers (SAE), which Automotive students are required to join. (Apply on-line at [www.sae.org/membership](http://www.sae.org/membership).) Students work on vehicle projects throughout their tenure. These projects enable them to acquire hands-on problem solving techniques, as well as program management skills that are essential in the automotive industry.

## Automotive Faculty

If you have any questions about the Automotive Specialty, please contact any of the following automotive faculty:

- Dr. Greg Davis, Room 1-121-MC
- Dr. Craig Hoff, Room 2-119-MC
- Dr. Richard Lundstrom, Room 2-135-MC
- Dr. Bassem Ramadan, Room 2-223-MC

## What Courses Will I Take?

Regardless of the chosen concentration, every student pursuing an M.E. degree at Kettering takes 39 courses and a thesis. Four of the 39 courses define a

specialty. A representative program for an Automotive Engineering Design student follows on the back page of this flyer.

Kettering University



Students pursuing the Automotive Engineering Design Specialty have the opportunity to participate in Kettering's snowmobile team. Pictured here is the 2008 team competing at Michigan Tech.

### Freshman I Term

CHEM-135/136	Principles of Chemistry & Lab
MECH-100	Engineering Graphical Communication <sup>1</sup>
ORTN-101	Orientation
MATH-101	Calculus I
COMM-101	Written & Oral Communication I

### Freshman II Term

HUMN-201	Introduction to Humanities
MATH-102	Calculus II
IME-100	Interdisciplinary Design & Manufacturing <sup>1</sup>
PHYS-114/115	Newtonian Mechanics & Lab

### Sophomore I Term

ECON-201	Economic Principles
MATH-203	Multivariate Calculus
MECH-210	Mechanics I
PHYS-224/225	Electricity and Magnetism & Lab

### Sophomore II Term

CHEM-145/146	Industrial Organic Chemistry & Lab
EE-212 &	Applied Electrical Circuits Lecture
MECH-231L	Signals for Mechanical Systems Lab
MATH-204	Differential Equations & Laplace Transforms
MECH-212	Mechanics II

### Junior I Term

IME-301	Engineering Materials
MATH-305	Numerical Methods and Matrices
MECH-310	Mechanics III
MECH-311	Intro. to Mechanical System Design
SSCI-201	Introduction to the Social Sciences

### Junior II Term

COMM-301	Written & Oral Communication II
MATH-408	Probability & Statistics
MECH-300	Computer Aided Engineering <sup>2</sup>
MECH-312	Mechanical Components I
MECH-320	Thermodynamics

### Senior I Term

MECH-322	Fluid Mechanics
MECH-330	Dynamic Systems I
	Advanced Humanities Elective
	Automotive Specialty Elective
	Automotive Specialty Elective

### Senior II Term

MECH-420	Heat Transfer
MECH-430	Dynamic Systems II
	Advanced Social Science Elective
	Automotive Specialty Elective

### Senior III Term

LS-489	Senior Seminar
MECH-422	Energy Systems Lab
MECH-548	Vehicle Design Project
	Automotive Specialty Elective

**Automotive Specialty Electives:** You must take a total of four (4) automotive specialty electives. These courses may be taken at Kettering or through one of the many study-abroad programs.

I. Take a minimum of three (3) course from the following list:

- MECH-516 Intro. to FEM with Structural Application
- MECH-540 Internal Combustion Engines
- MECH-541 Advanced Automotive Power Systems
- MECH-542 Chassis System Design
- MECH-544 Introduction to Automotive Powertrains
- MECH-545 Hybrid Electric Vehicles
- MECH-546 Vehicle Systems Dynamics

II. Take one (1) course from the following list:

- Any courses previously listed.
- Other approved courses from Kettering, including:
  - MECH-510 Analysis & Testing of Machines/Mech Ass.
  - MECH-515 Failure & Mat'l Considerations in Design
  - MECH-526 Fuel Cell Science & Engineering
  - MECH-550 Automotive Bioengineering: Occupant Protection & Safety
  - MECH-551 Vehicular Crash Dynamics and Accident Reconstruction
  - IME-540 Environmentally Conscious Design & Mngf.
  - IME-575 Failure Analysis
  - EE-580 Automotive Electronic Systems
- Other courses with the approval of the automotive faculty.

III. Take the Automotive Capstone Course MECH-548, Vehicle Design Project.

<sup>1</sup>Approximately one-half of the students take MECH-100 FR-I and IME-100 FR-II, the other one-half take IME-100 FR-I and MECH-100 FR-II.

<sup>2</sup>Approximately one-half of the students take ME CH-300 JR-II and MECH-311 JR-I, the other one-half take MECH-311 JR-II and MECH-300 SR-I.