San José State University  
Mechanical Engineering Department  
ME 186 Automotive Engineering, Section 1, Fall, 2014

Course and Contact Information

Instructor: Michael Helms

Office Location: 
Telephone: (408) 641-5549

Email: Michael.helms@sjsu.edu

Office Hours: By appointment

Class Days/Time: Wednesday 6:00-8:45

Classroom: Clark Hall 234

Prerequisites: ME 114, ME 130, ME 154. Students must sign consent & acknowledgement form.

Course Description

Overview of automotive engineering including powerplant, structures, suspension, steering, brakes, tires, and drive train. Application of engineering principles in automotive design and analysis. Introduction to alternative vehicle technologies. Use of mechanical engineering principles for automobile performance analysis.

Learning Outcomes (Required) and Course Goals (Optional)

Course Goals:
1. Learn automotive specific engineering principles
2. Learn basic automobile operational principles
3. Study alternative vehicle technologies
4. Apply engineering principles to automotive component design
5. Apply engineering principles to analyze automobile stability and handling.

Student Learning Objectives:
1. The ability to identify various components of automotive vehicles
2. The ability to describe various automotive operational principles
3. The ability to calculate basic automotive performance parameters
4. The ability to describe automotive systems in terms of engineering models
5. The ability to apply simple concepts in automotive design processes

Required Texts/Readings

Textbook

Other Readings

Grading: HW 15%
Mid Term 25%
Project 20%
Final Exam 40%

Final Exam Date: Wednesday 12/17/2014, 17:15 to 19:30

Classroom Protocol:
Regular attendance and active participation are encouraged. Please attend to non-classroom related discussion outside of the classroom.

University Policies

Dropping and Adding
Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester’s Catalog Policies section at http://info.sjsu.edu/static/catalog/policies.html. Add/drop deadlines can be found on the current academic year calendars document on the Academic Calendars webpage at http://www.sjsu.edu/provost/services/academic_calendars/. The Late Drop Policy is available at http://www.sjsu.edu/aars/policies/latedrops/policy/. Students should be aware of the current deadlines and penalties for dropping classes.

Information about the latest changes and news is available at the Advising Hub at http://www.sjsu.edu/advising/.

Consent for Recording of Class and Public Sharing of Instructor Material

University Policy S12-7,

- “Common courtesy and professional behavior dictate that you notify someone when you are recording him/her. You must obtain the instructor’s permission to make audio or video recordings in this class. Such permission allows the recordings to be used for your private, study purposes only. The recordings are the intellectual property of the instructor; you have not been given any rights to reproduce or distribute the material.”
  - It is suggested that the greensheet include the instructor’s process for granting permission, whether in writing or orally and whether for the whole semester or on a class by class basis.
  - In classes where active participation of students or guests may be on the recording, permission of those students or guests should be obtained as well.
- “Course material developed by the instructor is the intellectual property of the instructor and cannot be shared publicly without his/her approval. You may not publicly share or upload instructor generated material for this course such as exam questions, lecture notes, or homework solutions without instructor consent.”

Academic integrity

Your commitment, as a student, to learning is evidenced by your enrollment at San Jose State University. The University Academic Integrity Policy S07-2 at http://www.sjsu.edu/senate/docs/S07-2.pdf requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The Student Conduct and Ethical Development website is available at http://www.sjsu.edu/studentconduct/.
Campus Policy in Compliance with the American Disabilities Act

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 at http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf requires that students with disabilities requesting accommodations must register with the Accessible Education Center (AEC) at http://www.sjsu.edu/aec to establish a record of their disability.
# ME 186 / Automotive Engineering, Fall 2014, Course Schedule

## Course Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics, Readings, Assignments, Deadlines</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction and course overview. Term project assigned. Automobile power plants.</td>
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<tr>
<td>2</td>
<td>Basic Hybrid configurations. Combustion and IC engine fundamentals.</td>
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<tr>
<td>3</td>
<td>IC Engines continued. Otto and Diesel cycles. HW #1, Term project proposal, due.</td>
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<tr>
<td>4</td>
<td>Cams, exhaust, bearings and design considerations</td>
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<tr>
<td>5</td>
<td>Axle loads, acceleration and braking performance   HW #2 due.</td>
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<tr>
<td>6</td>
<td>Power plant summary and  Engine teardown lab.</td>
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<tr>
<td>7</td>
<td>Transmissions and driveline   HW 3 due.</td>
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<tr>
<td>8</td>
<td>Midterm Exam based on weeks 1-6.</td>
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<tr>
<td>9</td>
<td>Gearing and Transmission tear down lab  HW 4 due</td>
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<tr>
<td>10</td>
<td>Road loads, Automobile Aerodynamics.</td>
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<tr>
<td>11</td>
<td>Vehicle ride and Random vibrations. HW 5 due.</td>
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<tr>
<td>12</td>
<td>Pneumatic tires and steady state cornering.</td>
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<tr>
<td>13</td>
<td>Cornering continued and steering system HW 6 due.</td>
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<tr>
<td>14</td>
<td>Prius lab. (Thanksgiving week)</td>
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<tr>
<td>15</td>
<td>Suspensions.   HW 7 due.</td>
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<tr>
<td>16</td>
<td>Term project presentations. Review for final exam.</td>
</tr>
<tr>
<td>Final Exam</td>
<td>Wednesday 12/17/2014, 17:15 to 19:30</td>
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