

<b>Course Number</b>	<i>EAS 199A</i>
<b>Title</b>	<i>Engineering Problem Solving I</i>
<b>CRN</b>	<i>15237 (section 002) and 14622 (section 00A)</i>
<b>Credits</b>	<i>2</i>
<b>Prerequisite(s)</b>	<i>College algebra</i>
<b>Days/Time</b>	<i>Mondays and Wednesdays, 10:00 – 11:50 AM (section 002)</i> <i>Mondays and Wednesdays, 2:00 – 3:50 PM (section 00A)</i>
<b>Location</b>	<i>Engineering Building, Room 365</i>
<b>Final Exam Day/Time</b>	<i>Wednesday, December 8, 2010, 10:15 AM – 12:05 PM (section 002)</i> <i>Wednesday, December 8, 2010, 12:30 AM – 2:20 PM (section 00A)</i>
<b>Course website</b>	<i>web.cecs.pdx.edu/~gerry/class/EAS199A</i>
<b>Instructor</b>	<i>Gerald Recktenwald</i>
<b>E-mail</b>	<i>gerry@me.pdx.edu</i>
<b>Phone</b>	<i>503-725-4290</i>
<b>Office</b>	<i>Engineering Building, Room 402K</i>
<b>Office Hours</b>	<i>Tentative: Tuesdays 4:00 – 5:30 PM, Thursdays, noon to 1:30 PM</i>
<b>Mailbox</b>	<i>ME Office, Engineering Building Room 400</i>

### **Course Description**

EAS 199A, 199B, and 199C constitute an introduction to skills, modern tools, teamwork, design methodology and professional practices of typical engineer. In EAS 199A, students learn to analyze, fabricate and troubleshoot electromechanical systems. They learn programming and solid modeling. They use written and oral communication as part of assignments and class projects.

### **Textbook and other required course materials**

There is no textbook. Reading materials and class notes will be provided on the class web site. Students are required to have their own laptop computer that they bring to class. Specifications for the laptops are given below. Students must purchase a microcontroller project kit called the SparkFun Inventor's Kit for Arduino. The kits are available at the Portland State Bookstore.

### **Computer Requirements**

Students are required to have their own laptop computer. Laptops running the latest versions of Windows, or Macintosh operating systems are acceptable. Regardless of the operating system chosen, students are expected to be able to maintain and use their computers to complete the homework assignments in the class. The instructors and Teaching Assistants cannot offer tutoring or system maintenance support. Students will need to have a recent version of the Microsoft Office software suite. Students will need to run Excel, and PowerPoint during in-class exercises and presentations. Students will need to demonstrate proficiency with Excel during quizzes and exams.

The Maseeh College has two general purpose computing laboratories in room EB 325 and FAB 55-17. See [cat.pdx.edu/students/labs](http://cat.pdx.edu/students/labs) and [cat.pdx.edu/labstatus](http://cat.pdx.edu/labstatus) for more information. Solidworks and MathCAD are installed on the computers in the EB 325 lab.

### **Toolkit**

Students are required to assemble a set of hand tools to be used in completing homework assignments and in-class exercises. Students are expected to bring the tools to class. The list of tools is specified on the class website.

### **Liability Release**

Students will be working with hand tools, power tools and electronic equipment during class, and as part of completing homework assignments and projects. Students will be provided instruction in the safe use of these tools and equipment. As a condition of taking the class, students must agree to sign a form that releases Portland State University and its staff from liability for injury caused during the use of the equipment.

## Course Learning Objectives:

	ABET Program Outcomes*
<i>At the completion of the course, students must...</i>	
1. Be able to analyze DC circuits with Ohm's law, and Kirchoff's voltage and current laws	a
2. Be able to build and debug electrical circuits on a breadboard	a, b
3. Be able to write and debug programs for the Arduino microcontroller platform, and to use those programs to read data from sensors and to control LEDs, transistors and motors.	a, k
4. Be able to read hand sketches and machine drawings.	a, c, k
5. Be able to use SolidWorks to make two-dimensional sketches, three-dimensional solid models, dimensioned part drawings, and assembly drawings.	c, k
6. Be able to safely and effectively perform drilling operations with a manual milling machine.	k
7. Be able to fabricate small mechanical components and assemble those components in to a working electromechanical systems.	k
8. Be able to perform mathematical analysis and plotting with Excel and MathCAD.	b, k
9. Be able to measure performance of a water pump, and analyze the results using least squares curve fits.	b
10. Be able to make presentations and short written reports in a professional format.	g
11. Be able to work in teams to complete projects that involve fabrication, assembly and testing of small mechanical systems.	d

\*Program Outcomes are Learning Outcomes for the entire BSME Program. Refer to the standard ABET learning outcomes listed at <http://www.me.pdx.edu/programs/undergrad/objectives.php>. Outcome "a" is "An ability to apply knowledge of mathematics, science, and engineering", Outcome "b" is "an ability to design and conduct experiments, as well as to analyze and interpret data"

## Course Grading

Assessment	Percent of Total Grade	Comment
Homework	20 %	Some assignments are individual and some are done in teams. On team assignments, all team members get the same grade
Quizzes	20 %	Two quizzes, each worth 10%
Midterm	20 %	
Final Exam	20 %	
Desktop fan project	10 %	Completed by teams of two
Pump project	15 %	Completed by teams of two

**Incompletes:** A grade of "I" is granted by the instructor *only* with prior approval and consent. Criteria are outlined in the PSU Bulletin. Poor performance in the class is *not* a valid reason for granting an I (incomplete).

**Program requirements:** Admission to the BSME program requires a grade of C or better in EAS 199A. Additional GPA requirements also apply as described in the PSU Bulletin.

## Course Schedule

Readings, lecture notes, homework assignments and other materials will be distributed by posting to the class website.