ENGR08: How Do Computers Work?
Syllabus - Spring 2013

MWF 9:30-10:20, Hicks 212

Course Website:  http://www.swarthmore.edu/NatSci/tali/E08/E08.html

Instructor Information:
Prof. Tali Moreshet
Office: Hicks 218
Phone (office): 328-8331
Email: tali@swarthmore.edu
Office Hours: Tues. 2-4pm, and open door policy.

Course Description:
This course is aimed at an audience of scientists and non-scientists who have little to no background in computers, but have interest in learning more about them.

This course combines technical basics of digital systems and computer organization with non-technical topics, including the history of computers and great inventions in computing. You will be learning how computers work, what are the components that make up a computer, how data is stored and represented inside a computer, and how we can make computers do what we want them to do. If there is anything you would like to know about computers, we may be able to incorporate it into the course as well.

The following topics may be covered:

- What are the components that make up a computer
- How is data represented and stored inside a computer
- How is data processed digitally
- How can we make computers do what we want them to do
- What is an operating system and what does it do
- How computers share data and communicate
- What makes the Internet work
- Security risks and defenses
- Wireless communication
- What are multiprocessors
- The future of computing

Also:
- History of computers
- Human-computer interaction
- Computer ethics
- Marketing strategies and advertizing
- Legal issues: intellectual property issues for software, patents & copyrights
- Great inventions in computing
Please check the course website often for an updated course schedule, readings, labs and homework schedule.

**Prerequisites:** None.

**Course Objectives:**

- Identify parts of a computer, and explain how a computer system is organized.
- Explain how the hardware and software portions of a computer system operate and relate.
- Understand how computers communicate with each other, and how the Internet works.
- Understand high-level technical articles about computers.

**Readings:**

- Nell Dale and John Lewis, Computer Science Illuminated, Jones and Bartlett, parts of the 3rd edition available online, the 4th edition is available in the science library.
- Additional readings will be posted throughout the semester.

**Grading:**
The course will have 2 exams and weekly assignments in the form of homeworks, labs, and class presentations.

- It is legitimate to work together on homework, but not to copy. The homework you turn in should reflect your individual work.
- Labs may done in groups of 2-3 or individually. You may discuss your lab report with other groups, but you may not copy anything from their reports.
- Any outside sources used for your lab reports (or homework, where appropriate), such as books and on-line resources, should be explicitly cited.

Grading will follow approximately the divisions shown below.

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Homework &amp; Labs</td>
<td>20%</td>
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<tr>
<td>Exams</td>
<td>40%</td>
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<tr>
<td>Class presentations</td>
<td>15%</td>
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<td>Final project</td>
<td>15%</td>
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<tr>
<td>Attendance and participation</td>
<td>10%</td>
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**Late Policy:**
Assignments will be due at the beginning of class on the day specified. I will do my best to return your graded work in a timely manner, and I expect you to turn in your work on time. Substantial grade penalty will be given to work that is turned in late without advanced permission.