ECPE 170

Computer Systems and Networks

Class Syllabus, Spring 2010

General Information

<table>
<thead>
<tr>
<th>Instructor:</th>
<th>Prof. Jinzhu Gao</th>
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<tr>
<td>Office:</td>
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<td>946-3037</td>
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<tr>
<td>Office Hours:</td>
<td>MWF 2-4pm, and by appt</td>
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<td>WWW:</td>
<td><a href="http://www1.pacific.edu/~jgao/">http://www1.pacific.edu/~jgao/</a></td>
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<td><a href="http://pacific.rsmart.com">http://pacific.rsmart.com</a></td>
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<td>Class Hours:</td>
<td>MWF 11:00am-12:20pm</td>
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Prerequisites

- COMP 51 or equivalent programming experience
- COMP 47 or ECPE 71 recommended

Class Goals

This course is a comprehensive and holistic examination of the modern computing environment. Students will learn to understand the function and design of the various hardware and software components necessary to process digital information and execute applications.

Computing systems are presented as layers of abstract virtual machines, starting with low-level hardware,
progressing through system software and continuing to network hardware and protocols. Emphasis is on the functionality provided by the various components and how the typical design considerations of these components impact the efficiency and effectiveness of computer applications. Equal emphasis is placed on the communication paths and data translations necessary to allow the layers of components to operate as a unified system.

This approach gives students a comprehensive overview of computing systems sufficient to understand how systems components are engaged in the execution of software applications, such that they can appropriately identify and understand the design trade-offs necessary to develop efficient software and hardware.

**Primary objectives**

After completing this course, you should be able to:

- Use binary mathematics, Boolean algebra and the digital representation of numbers.
- Recognize the fundamental digital circuits that implement basic digital functions.
- Describe the basic components of a central processing unit.
- Describe the instructions execution cycle of a CPU.
- Describe the components of the memory hierarchy, how these various components are utilized and how data is moved between them.
- Understand how data flows among primary computer components, and how these data flows impact the efficiency of software applications.
- Interpret the basic structure of common machine and assembly level instructions.
- Explain what assemblers, linkers and compilers do, and how they work together to generate and execute libraries and programs.
- Describe how peripheral devices communicate with the processor.
- Explain the primary services provided by an operating system.
- Explain how file systems are used to organize secondary storage.
- Explain the protocols and models that underlie computer networks.
- Describe the physical components and communication paths of modern computer networks.

Assessment of these topics will be conducted through homework, quizzes, and exams.

**General objectives**

Having completed this course and lab you should have improved in the following areas:

- Basic learning skills
- Critical thinking skills
- Written communications skills
- Understanding the value and need for lifelong learning

Assessment of the first two areas will be conducted by homework, quizzes and exams. Assessment of written skills will be done primarily through homework.
Course grade

Grades for the course are assigned on the scale below; the grading criteria follows.

<table>
<thead>
<tr>
<th>Points</th>
<th>&gt;93</th>
<th>93-90</th>
<th>90-87</th>
<th>87-83</th>
<th>83-80</th>
<th>80-77</th>
<th>77-73</th>
<th>73-70</th>
<th>70-67</th>
<th>67-60</th>
<th>&lt;60</th>
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<tbody>
<tr>
<td>Grade</td>
<td>A</td>
<td>A-</td>
<td>B+</td>
<td>B</td>
<td>B-</td>
<td>C+</td>
<td>C</td>
<td>C-</td>
<td>D+</td>
<td>D</td>
<td>F</td>
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**Homework: 10%** - Homework problems will be assigned frequently (almost every class period). The purpose of homework is for you to exercise your skills and discover how well (or poorly) you understand the course subject matter before you take the quizzes and exams. Solutions to homework assignments will be discussed in class and/or given on the web. Homework is due at the start of class, and no make-up work will be given for missed or late homework assignments. Your grade will be determined by the correctness of your homework and the amount of honest effort you put forth.

**Quizzes: 30%** - There will be five to six quizzes given during the semester, approximately two prior to each exam. The lowest quiz grade will be dropped. These quizzes test portions your knowledge on materials you should have mastered in this class and are intended to help you prepare for exams. Make-up quizzes will be given only for excused absences. The quizzes will consist of material covered in class, homework, and outside reading (i.e., textbook).

**Exams: 60%** - There will be four exams. Three will occur during the normal 15-week session and one (the final exam) will occur during the final exam period. Exams will occur about every five weeks. Each exam will be 75-90 minutes long and will cover material since the previous exam. The lowest exam grade will be dropped (including the final). Make-up exams will be given only for excused absences. The exams will consist of material covered in class, homework, and outside reading (i.e., textbook).

Using code from other sources

In many cases, it may be possible to identify reusable source code from textbooks, web sites or other resources. When such code is not the primary focus of the assignment, this is encouraged and appropriate. However, the source of all borrowed code must be appropriately identified. All ethical rules regarding plagiarism and copyrights apply to code as well as written texts. Students are responsible for understanding the theory behind all algorithms or source code they use.

Honor Code

The University Honor Code is an essential element in academic integrity. It is a violation of the Honor Code to give or receive information from another student during an examination; or to submit all or part of someone else's work as one's own. If a student violates the Honor Code, the faculty member may refer the matter to the Office of Student Life. If found guilty, the student may be penalized with failure of the assignment or failure of the course. The student may also be reprimanded or suspended from the University. A complete statement of the Honor Code may be found in the student handbook, the **Tiger Lore**.