

BU ENG EC 440 Introduction to Operating Systems Syllabus

Spring 2012

Place & Time

Monday and Wednesday: 5-7 PM. PSY B53

Course Website

Materials for this course are available on Blackboard

Instructor

Peter Baer Galvin – I can be reached at pbg@bu.edu

Office Hours

None pre-set, available by appointment or after class

Assistants

GTA - Tiansheng Zhang tszhang@bu.edu aka Sean

Course Description

Operating system concepts and design objectives. Concurrent processes, process synchronization, and deadlocks. Resource management including virtual memory, CPU scheduling, and secondary storage. File structures, input/output, and distributed systems. Case studies of popular operating systems. 4 cr.

Prerequisites

EC 327 and EC 413

Some knowledge of Unix / Linux, C, shell programming, data structures

We will be using the GUI and command line of our sample operating systems, plus programming in shell script, C and Java.

Text

Operating Systems Concepts 8th Ed Updated, by Silberschatz, Galvin, and Gagne, John Wiley and Sons, 2012. (<http://codex.cs.yale.edu/avi/os-book/OS8/os8c/index.html>). There will likely be additional notes and handouts. The slides for the course are available at the book site and on Blackboard.

Course Outline

We will cover most of the contents of chapters 1 through 14 of our text, plus some assorted other sections of the book and various other topics.

Topics include

- Introduction to operating systems and operating system structures
- System call interfaces (POSIX and Win32)
- Processes and threads
- Concurrent programming in Pthreads (C) and Java
- Thread scheduling and synchronization
- Managing deadlocks
- Memory management and virtual memory
- I / O
- File systems
- Mass storage structures
- Protection and security
- Linux/UNIX, and Windows case studies

Labs

We will have various labs throughout the course. Lab work can be done on your own or in PHO 117. There are two virtual machines that are needed for lab work. One contains Fedora 16, including source code and a compiled kernel. The other contains Solaris 11. Any given assignment will provide details on which VM to use. Together they take about 25GB so you might want to work in the lab rather than on your computer. They are in VMware format so if you can run VMware VMs you can work on your own equipment.

Some lectures will be done in PHO 117, but most will be in PSY 53. Watch Blackboard and listen in class for details on which lecture will be where.

Sean will also have Lab hours – he will be available in PHO 117 to help with general questions and with lab questions. Those hours are likely Tue and Thur 7-9PM.

Projects / labs will include (but not be limited to):

- OS exploration
- Shell scripting

- C and Java programming
- Reading and reporting on published papers
- Presenting to the class

Rules

You are encouraged to bring your laptops to the class for note taking, etc.

Midterm is open book. Final exam will be closed book but you will be allowed to bring a one-page study guide.

You are responsible for knowing material assigned as readings, covered in the class, homework, and projects

There will be several assignments throughout this semester, each with a particular weight and due date. It is expected that you complete all assignments and turn in all necessary information upon the due date. My policy will be to deduct 5% for each day that an assignment is turned in late (weekends count as one day.) Such a policy is intended to encourage you to plan accordingly and reward those who do.

Academic dishonesty will be treated seriously

Grading

Your grade will be composed of

Class participation / Quizzes	15%	
Projects / labs	25%	~10
Midterm (open book)	25%	1
Final	35%	1

Grades will be scaled per assignment / lab / test

Class partition counts, and you are expected to attend the class and actively contribute by asking and / or answering questions.

Homework will be assigned but not collected / graded. Think of it as review material.

Resources

These might be useful but are not “required” for the course.

- *A Book on C* by Kelley and Pohl
- C Language (including data structures) reference:
<http://cprogramminglanguage.net/c-data-structure.aspx>

- *Computer Science, an Overview* by J Glenn Brookshear
- *Unix and Linux System Administration Handbook, 4th Ed* by Nemeth et al
- *Linux in a Nutshell 6th Ed* by Siever et al
- *Bash quick reference* by Robbins
- *Understanding the Linux Kernel, 3rd Ed* by Bovet and Caseti
- *Practical Guide to Fedora and Red Hat Enterprise Linux 5th Ed* by Sobell
- *Practical Guide to Ubuntu Linux 3rd Ed* by Sobell
- *Computer Science, an Overview 10th Ed* by Brookshear
- <http://lxr.linux.no/>