Course Syllabus

ENEE 459J: Consumer Electronics
Prof. Bruce Jacob

Basic Information

Time & Place

Lab: Wed 2:00 – 4:00 pm, AVW-1366
Discussion: Fri 11:00 am – 12:15 pm, CSI-3118

Professor

Bruce L. Jacob: AVW-1325, blj@ece.umd.edu
Office hours: *Open-door policy (for now …)*

Teaching Assistants

Joe Gross: joegross@umd.edu
Paul Rosenfeld: prosenf1@umd.edu

Class Home Page & Email List

http://www.ece.umd.edu/courses/enee459j
enee459j-0101-spr09@coursemail.umd.edu

Class Schedule

This is a weekly schedule of my hours, including class time and scheduled office hours, but also including other things that make me unavailable. It is subject to change.

	MON	TUE	WED	THU	FRI
9–9:30					
9:30–10					
10–10:30					
10:30–11					
11–1:30					**ENEE 459J** Disc. CSI-3118
11:30–12					
12–12:30		**ENES 100** Lecture JMP-1215		**ENES 100** Lecture JMP-1215	
12:30–1					Meetings with graduate students
1–1:30					
1:30–2					
2–2:30			**ENEE 459J** Lab AVW-1366		
2:30–3					
3–3:30					
3:30–4					
4–4:30			**ENEE 159B** Lab AVW-1366		
4:30–5					
5–5:30					
5:30–6					

Course Overview

This class will teach the skills necessary for good product design and development in the real world, focusing on real-time embedded systems, particularly consumer electronics (MP3 players, mobile wireless handheld devices, etc.).

The class will be structured as a start-up company's research & development department: students will develop design specs and have latitude in the choice of implementation. Within several weeks, the group/s will be defined and projects selected; the bulk of the class will be spent discussing how best to implement the chosen projects and then implementing them.

Topics covered will include economics of start-ups, the rigor and attention to detail that is required to do good work, the realities of time and code, fundamentals of networked software, good and bad architecture-design principles, and the details of modern software, hardware, and firmware design.

Prerequisites

A student must know either of the following two things very well:

- How to program. The language that the student knows does not matter; the skill level matters more.
- How to interface to hardware components (e.g., the development of circuit boards).

It is not required that a student know both (but of course that would certainly help). The more a student knows, they more he/she will benefit from this class.

Course Materials

The required texts for the course:

Hackers & Painters, by Paul Graham

The Mythical Man-Month, by Frederick Brooks. Jr.

Hackers & Painters: Big Ideas from the Computer Age is a book all about developing code and starting up companies, and it is especially powerful because it goes deep into the thinking that is required (on the technical side) to create a successful start-up company. It is written by one of the two founders of Viaweb, the company that built the engine that now powers Yahoo! Stores.

The Mythical Man-Month: Essays on Software Engineering is the classic book on software development (arguably, it is just as equally applicable to system development of any type) and is the model upon which Graham bases his own book. Brooks's main thesis is that adding more manpower to a project, especially late in the process, is worse than doing nothing, and it has been borne out in practice many times over.

Class Project & Grading

There will be one large, group-oriented project that forms the bulk of the grade. Individual contribution and class participation will account for the rest of the grade.

- Project: 2/3
- Individual: 1/3

Tentative Lecture Schedule

Week	Subject	Readings	Lab/Projects
1	Intro to course	PG1, FB1–3	
2	Networked & real-time applications	PG2, FB4	Preliminary project specification
3	UNIX and its APIs (networking, real-time)	PG3, FB5	Project specification complete
4	Mobility and client/server architectures	PG4, FB6	
5	Web-based standards, hardware standards	PG5, FB7	
6	PCB design, fabrication, assembly	PG6, FB8	
7	Firmware design, UNIX drivers	PG7, FB9	First design review
8	Design for quality (test, maintenance, etc.)	PG8, FB10	
9	Case studies: BT vs. PCM	PG9, FB11	
10	Good/bad design principles	PG10, FB12	Second design review
11	Languages as a medium of expression	PG11, FB13	
12	Economics, wealth, and starting a company	PG12, FB14	
13	Users vs. designers vs. developers	PG13, FB15	Third design review
14	"Taste for designers"	PG14, FB16	
15	Future trends	PG15, FB17	
Exams	**Final Design Presentation/s**		

Special Needs

If you have a documented disability that requires special needs, please see me as soon as possible, and certainly no later than the third week of classes.