EEL 4744C: MICROPROCESSOR APPLICATIONS

http://mil.ufl.edu/4744/

INSTRUCTOR Dr. Eric M. Schwartz MAE-B 321 392-2541 ems@mil.ufl.edu Office Hours: Mon per 7; Wed, per 6-7

LECTURES Tues 7th (1:55-2:45pm), Thur 7th- 8th (1:55-3:50pm) MAEB 211

LAB SECTIONS (NEB 281)

~~6012 M 4th-6th (MC).~~	3189 M 9th-11th (AN).	2058 T 3rd-5th (EJ).	**1524 T E1-3 (MC)**.
6020 W 5-7 (MC)	3276 W E1-3 (CW).	~~**1524 R 3rd-5th** (XX)~~.	6483 F 10th-E1 (CW).

CATALOG DESCRIPTION
Elements of microprocessor-based systems; hardware interfacing and software design for their application. Laboratory.

COURSE OBJECTIVES (ABET Design Content 50%) [Lab fee: $166.35] [Other fees: $6.49+tax (Radio Shack)]
The student will learn the functional and technological characteristics of microprocessor structures, memory components, peripheral support devices, and interface logic. Through laboratory experiments and textbook examples the student will learn how to integrate and apply microcomputer subsystems and components to common interfacing problems. The TI F28335 DSP will serve as the vehicle for exploring these topics.

TEXTBOOKS
F. Cady, *Microcontrollers and Microcomputers Principles of Software and Hardware Engineering*, Second Edition, Oxford University Press, New York, NY, 2009, ISBN13: 9780195371611, ISBN10: 0195371615.

REFERENCES
- Gene H. Miller, *Microcomputer Engineering—2nd edition*, Prentice-Hall, New Jersey, 1999.
- H. Lam & A. Arroyo, *Fundamentals of Computer Engineering*, Univ. Copy Center, Gainesville, FL 1995.
- J. Peatman, *Design with Microcontrollers*, McGraw Hill, New York, 1988.
- K. Doty, *Fundamental Principles of MicroComputer Architecture,* Matrix Publishers, Inc., Oregon, 1979.

OFFICE HOURS
You may go to any TA available, not just the one teaching your lab section. The instructor will hold office hours (as shown above) or by appointment. If you come by at any other time, I reserve the right to say, "I'm busy," although I rarely say this (even though it's invariably true). You are encouraged to use e-mail to communicate with the instructor and TAs.

TA Office hours in NEB 281 (when available), NEB 212 (2nd choice), or NEB 222

TA name	Michael Carroll	Colin Watson	Ali Nuhi	Eric Jeffers
office hour	W 10th Help in NEB 101; M,W,F: 4th	T: 11th Help in MAEB 211; M,W: 6th	M,F: 5th	M,F: 3rd
e-mail	me@michaelrcarroll.com	colinw@ufl.edu	anuhi@ufl.edu	eric@ufl.edu
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MULTIMEDIA CLASS/AUDIENCE NOTES
Audience notes are normally from the class web site every week or so for the subsequent week or more of classes. The notes consist of pdf versions of the class PowerPoint slides with some space for note taking. These notes are not required but are **highly** recommended. Check the class web site for information on exactly when the notes are available. **For optimal performance**, read the notes and examples for a class **before** that class and bring the **printed** class **notes and examples** to class to augment the printed material with your own notes. Notes will be removed shortly after they are covered in class.

EXAM SCHEDULE
The exams will be given outside of regular class time..

Exam Schedule

EXAM	DATE	TIME	LOCATION
Exam 1	*Wed, 22 February	5:10pm	**LAR 310**
Exam 2	*Thurs, 5 April	5:10pm	**NEB 202**
Exam 3	*Tues, 24 April	5:10pm	**MCCC 100**

*Tentatively scheduled

HARDWARE PURCHASES

- Wire-wrap tool [required]
- Soldering Iron [purchases optional, but recommended]. We will have soldering irons in our lab.
- Wire cutters and needle-nosed pliers [purchases optional, but recommended]. We will have a few of each available in lab.
- UF TI DSP F28335 board kit [required]. The UF TI DSP F28335 board kit is now included in your lab fees. Your parts kit comes with a printed circuit board (PCB) with a large prototyping area and with a TMS320F28335 already mounted on the board. You will get over 120 parts including RAM, USB cable, LCD Panel, and many sockets and other components. **You can not buy the kits separately, so please be careful as you design and construct your circuits this semester.**

Radio Shack has a wire-wrap/stripper tool (*Radio Shack* part #: 276-1570) for $6.49, an outstanding price! The *Radio Shack* on Archer Road (375-2426) ordered enough for the entire class. The wire wrap tools are now available. *Radio Shack*, *Lowes*, and *Home Depot* all sell soldering irons. Jameco.com has a cheap one (part # 224602) for about $18 including shipping.

You **MUST** have and use your own laptop for this course, since there are no computers available in the 4744 lab. You will be given your UF TI DSP F28335 board kit in your first lab meeting (Lab 0). This kit contains most of the additional hardware that you will add to your boards over the course of the semester. (You may also need to purchase some additional ICs or other components as the semester progresses.) Starting with lab 1, you will need to wire-wrap.

SOFTWARE SUGGESTION

Quartus (from Altera) has been now required for *EEL 3701C* and *EEL 4712C,* so many of you already have copies. Quartus Web Edition Version 9.1, Service Pack 2 is available to download, free of charge from Altera's website and our website. Some *EEL 4744C* homework and laboratory assignments will require the drawing or simulation of logic circuits. This program greatly simplifies such assignments. Since Quartus programs will be useful in other *ECE* courses *(EEL 4712, EEL 4713 and Senior Design),* we recommended that you obtain a copy if you have not already done so. If you have an old version of Quartus, it should work fine, although newer version are missing the simulator.

All grades are **non**-negotiable **one week** after the grade is posted. Please don't come to me after the final grades have been posted with a hard-luck story.

REFERENCE MANUALS (available on our class website)

- Assembly Language Tools v5.0.0 User's Guide (TI #: SPRU513C) (October 2007)
- CPU and Instruction Set Reference Guide (TI #: SPRU430E) (Jan 2009)
- Digital Signal Controllers (DSCs) Data Manual (TI #: SPRS439H)
- DSP Peripheral Reference Guide (TI #: SPRU566I) (May 2009)
- others

Do **NOT** printout these entire documents. Selected pages should be printed and brought to class, lab, and exams. Other documents are available on the class website and for the TI website (www.TI.com).

COURSE GRADE DETERMINATION

3 Midterm Exams	62-73%	(Exams are equally weighted)
Laboratory	25%*	(Some labs will count as less than 1 lab, some as a 1 lab, and some as more than 1 lab)
Homework	2-3%†	(4-10 homework)
(Pop) Quizzes	0-10%	(0-10 quizzes)
Total	100%	(90+ on exam 3 results in 5% grade bonus, e.g., 86% ⇒ 91%)

* A grade of 65% or better in Lab is ***required*** in order to obtain a passing grade. Your lowest lab will be dropped. But use this drop wisely, i.e., do **not** just skip a lab since all labs are important and your next missed lab may be unavoidable. If you need to miss a single lab, it's ok; you can **not** make up the missed lab. (You should do this lab on your own.) **If you have a valid reason for missing this lab, get documentation for your first missed lab and hold on to it.** If you miss a **second** lab, you must show the **professor** (not the TA) **written documentation for BOTH your first and your second missed labs**. This documentation should be official, i.e., from a doctor, judge, etc., so that a make-up can be arranged. You must notify the professor **prior** to your scheduled second missed lab or **as soon as possible after** your second missed lab. **There is no excuse that will allow you to reschedule your first missed lab other than an assembly exam in another course.** You must notify the professor at least 8 days prior to your assembly exam.

† Although HW does not count much toward your grade, **not** doing it will likely have an effect on your quiz and exam scores.

GRADING POLICY

UF grades are often distributed according to the following **rough** distribution: A: 10% B: 35% C: 45% D&E: 10% This usually works out to mean that if you make class average you will earn close to a "C+" or "B-" . If you score 10 percent above the class average, you will probably earn a "B." If you score 20 percent above class average, you will probably earn an "A**."** **This is not a contract on grading.** Rather, this information serves to provide you a rough understanding of your academic standing at any time during the semester. Grades are periodically posted on the class web site. **It is your responsibility to check your grades regularly** since mistakes often happen when dealing with a large number of students and TAs. **All grades are final one week after posting.** After curving exams as needed, course grades are assigned using the 70 (C), 80 (B), and 90 (A) cuts. [$86.\overline{6}$ → $89.\overline{9}$ (A-), $83.\overline{3}$ →$86.\overline{6}$ (B+)]

Part of your grade on tests, quizzes, labs, etc. is based not only on solving the problem you are presented with, but the manner in which you solve it. For example, there is a difference between two programs that meet the given specifications, but one is an elegant, extensible 20-line solution, while the other is an obfuscated 100-line program that also meets the specifications but would be difficult to extend later. Just as your future employer would value the latter program less than the first, so will I in grading your assignments.

The UF grading policies for assigning grade points can be found on the following undergraduate catalog web page: https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx .

All grades are **non**-negotiable **one week** after the grade is assigned. Please don't come to me after the final grades have been posted with a hard-luck story.

COURSE REQUIREMENTS

1. It is recommended that you bring your printed notes to each class, since you may need it for a pop quiz.
2. Perform all laboratory experiments. A grade of 65% or better in Lab is ***required*** in order to obtain a passing grade. Your lowest lab will be dropped. But use this drop wisely, i.e., do **not** just skip a lab since all labs are important and your next missed lab may be unavoidable. If you need to miss a single lab, it's ok; you can**not** make up the missed lab. (You should do this lab on your own.) **If you have a valid reason for missing this lab, get documentation for your first missed lab and hold on to it.** If you miss a **second** lab, you must show the **professor** (not the TA) **written documentation for BOTH your first and your second missed labs**. This documentation should be official, i.e., and from a doctor, judge, etc., so that a make-up can be arranged. You must notify the professor **prior** to your scheduled second missed lab or **as soon as possible after** your second missed lab. **There is no excuse that will allow you to reschedule your first missed lab other than an assembly exam in another course.** You must notify the Dr. Schwartz at least 8 days prior to your assembly exam so that an alternate lab time can be arranged.
3. Labs **must** be done at scheduled times.
   - An average lab grade of **65% or higher** is required to be **eligible** to **pass** the class!
4. Do all homework assignments and turn them in **within the first 3 minutes of class**.
   - ***Late homework will not be accepted.***
   - Homework will be collected, but will be "Zen" graded. The grade book will reflect submission and level of effort.
5. A quiz can happen at any time, during any class, i.e., quizzes are generally not announced ahead of time. You should therefore not miss class.
   - ***Missed quizzes cannot be made up.***
6. Take **3** during-term exams.
   - ***No makeup exams or test will be given except in cases of a medically documented incapacity or family emergency.***

STUDENTS WITH DISABILITIES

Students requesting classroom, laboratory or exam accommodations must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation.

UF COUNSELING SERVICES

Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:

- University Counseling & Wellness Center, http://www.counseling.ufl.edu, 3190 Radio Road, (352) 392-1575.
- SHCC mental Health, Student Health Care Center, http://shcc.ufl.edu/, Infirmary Building, 1 Fletcher Drive, 392-1161.
- Center for Sexual Assault/Abuse Recovery and Education (CARE), Student Health Care Center, 392-1161.
- Career Resource Center, http://www.crc.ufl.edu/, Reitz Union, 392-1601, career development assistance and counseling.

STUDENT PRIVACY

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments.

SOFTWARE USE

All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

CHEATING

*CHEATING WILL **NOT** BE TOLERATED*. We will actively search for cheaters. If you are caught, there will be **no** negotiations. You will **fail the course** and **get reported to the honor court**. There are **no excuses and no exceptions**. You may talk to other students about homework assignments and labs, but the final work **must** be your own. If you are caught

cheating on any assignment (homework, lab, quiz or exam), the **smallest** penalty possible is failure of the course. During a recent semester many students were caught with partly copied lab assignments. If this happens this semester, all of the students will earn an "E" in the course. A meeting with the instructor will determine ***additional penalties***, none of which are desirable or pleasant (*i.e.,* cheating in this course will result in a failing grade in the course, initiation of honor court charges, and possibly expulsion from the university). If you know someone is cheating, **it is your responsibility to report it**. We have and will continue to prosecute cheaters by turning them over to the office of Student Judicial Affairs. For more information about cheating, see the URLs: http://www.dso.ufl.edu/sccr/honorcodes/conductcode.php . For the copy of the UF Honor Code and consequences of academic dishonesty, please refer to http://www.dso.ufl.edu/sccr/honorcodes/honorcode.php.

DROPPING AND BRIGHT FUTURES http://www.dso.ufl.edu/sccr/faculty/process.phphttp://www.dso.ufl.edu/sccr/webforms/incidentreport.php .

Several new policies were implemented with Bright Futures in Fall 2009. Students must refund the cost of any dropped or withdrawn Bright Futures funded course. Full-time students must earn 24 semester hours per academic year. If you drop a course, you still must earn 24 semester hours per academic year in order to continue with Bright Futures funding. For more information, please contact the UF Student Financial Affairs office (**http://www.sfa.ufl.edu/programs/state-of-florida-programs/florida-bright-futures-scholarship-program/**), phone: 352-392-1275).

WORKING TOGETHER

You are encouraged to work with other students on **homework** assignments (**absolutely forbidden on labs**) in a professional manner. Each person in the group should attempt to solve all problems **independently** and **only** then discuss the results with one's partner(s) to correct errors and resolve differences. Copying your partner's work without a serious attempt on your part constitutes cheating and should not be permitted by your partner(s). Matching your solution to your partner's, however, is acceptable, if, after independent study and work you are convinced your partner's solution is correct. All solutions should reflect your style of problem solving, even those you have changed to match your partner's solution. In other words, **verbatim copying or simple paraphrasing of your partner's solution is not an acceptable form of cooperative study**. Your name **and your partner's name(s)** must be on your homework. You may **not** copy and submit old or new posted solutions as if they were your own.

You must do independent work on labs. Although you may ***consult*** with other students, TAs, or Professors, you ***must*** do independent work. Consulting means "**seeking opinions or advice**" ***not*** getting working programs or designs, understanding them, and then modifying them to make them your own. The latter constitutes cheating (see above section). Working side-by-side to construct a program or design in a group constitutes cheating. (Solving labs are good practice for solving quizzes and exams, which are also ***not*** group activities.)

All grades are **non**-negotiable **one week** after the grade is assigned. Please don't come to me after the final grades have been posted with a hard-luck story.

EXAM RE-GRADE POLICY

If you believe an error has been made on an exam score, you must make a written request to the instructor explaining where the misgrading or error occurred and why you think more credit is deserved. This request must be submitted **immediately at the end of the class in which the exam is returned**. If you do resubmit an exam, the instructor reserves the right to scrutinize and grade the **entire** exam more closely. This definitely places your current score at risk. Consequently, it is not advisable to resubmit an exam for re-grade unless a blatant grading error has been made. You **must** make it clear what writing you added to the exam (by clear indication, e.g., use a different color pen or pencil) after it was returned to you.

EXAM SOLUTIONS, HW SOLUTIONS AND LAB SHELLS

We will post homework, lab, lab program shells and other class material on our class web site at: http://mil.ufl.edu/4744/, along with periodic postings of your grades and the class grade book statistics. Solutions to the homework sets are usually posted on our class web site. Previous exams on the course material are also posted on our web site. Current exam solutions will be discussed and shown in class on the day the graded exam is returned to class, but will **not** be posted.

HOMEWORK GRADING

Homework sets are assigned periodically. Homework solutions are sometimes posted on our class web-site **before** they are due. It is ***not*** appropriate to copy the supplied solutions verbatim; this constitutes cheating. Homework sets will be collected but they will only be graded in a cursory fashion, i.e. Zen grading is used. The grades will be entered into the gradebook as 0 (no significant effort or not submitted), 1 (half-hearted attempt) or 2 (significant attempt). The final course grades will be assigned with strict cuts between grades, but HW ***could*** push you above a cut. Also, the (pop) quizzes will come from the class material, the labs, **and** the homework. In addition, the exams will be partly based on the assigned homework. **Late homework will not be accepted**.

LABORATORY GRADING

You will not be admitted to the lab without a prelab, i.e., a printout of **ALL** your circuit diagrams, simulations, and/or programs (VHDL), and answers to pre-lab questions (but not assembly language programs). Each circuit diagram and assembly language program list file must have your name (computer) printed at the top. All of the associated files **plus assembly language programs and list files** must **ALSO** be emailed to **eel4744uf@gmail.com BEFORE** the start of your

lab. (Do **NOT** send the email to your TA or the instructor.) **Proper subject headings are required**. You will receive a confirmation email; if you do **NOT** receive the confirmation email, then your email did **NOT** get through. Check your the email address and **send it again**. Do **NOT** send zip files or other archives; send individual files with the proper naming conventons.

Some labs will count more than other labs. Grading emphasis will be placed upon your producing well documented, well-structured programs and hardware designs that realize the functional requirements specified by the lab handout and the lab instructor. The remaining portion of your grade will result from observations by your lab instructor on such matters as your understanding of the lab, your lab techniques, your pre-lab preparation, your lab reports and your cooperation and compliance with the rules. Lab designs and/or software that are similar and/or identical to other student's work constitute cheating (see above) and result in you failing the course, honor court charges, and possibly expulsion from UF. We have software that will be used to look for plagiarized software. There may be a quiz at the beginning of some labs. If you are late for a lab, you will get a zero for the quiz.

HANDOUTS

Most handouts are supplied on-line and can be downloaded from the class web site: http://mil.ufl.edu/4744/. Old graded non-lab assignments not picked up in class can be picked up from Dr. Schwartz for a few days, then they will be recycled..

LABORATORY GUIDELINES

LABORATORY OBJECTIVES

The purpose of this laboratory is to teach students hardware and software development of microprocessor based applications. The laboratory complements the lectures by providing hands-on experience with microprocessors, peripheral devices and the required hardware and software development tools.

EQUIPMENT REQUIRED

1. UF TI DSP F28335 board kit including the USB cable.
2. In your first lab (lab 0) you will also be given a "bag of goodies," i.e., parts that you will use during the semester, including the UF TI DSP F28335 board kit.
3. Wirewrap tool.

LABORATORY PREPARATION

All of the lab experiments require advanced preparation in the form of assembly language coding, simulation, computations , circuit diagrams and, of course, reading and understanding the lab handout itself! These preparations **must** be finished **before** admittance to the lab for that experiment. Listings of pre-lab assembly language code (i.e., the .lst list file) must be in submitted online and syntactically correct. For your own benefit, attempt to have logically correct programs before lab as well as syntactically correct code. You must have printouts of your circuit diagrams. All printouts are turned in at the **start** of lab. (You might want to have a second copy for yourself, especially of circuit diagrams.)

Note: The best students have everything working **BEFORE** coming to lab.

Each submitted lab list file must have the following format:

Lab#_other_info_initials.asm.

For example, lab1a_EMS.asm, would be the file for lab 1, part a, for a student with initials EMS.

If any of the above is essentially identical to another student's work, this constitutes cheating. If you are caught cheating, you will fail the course, be brought up on honor court charges, and possibly expelled from UF.

LABORATORY ENTRY

The TA's will let you in at the start of your lab period. Your TA has the right to kick you out of the lab if you are not prepared, i.e., you do not have a **completed** prelab, or if you are uncooperative. Your TA will check the following:

- Turn in your printouts of **ALL** your circuit diagrams, simulations, and/or programs (VHDL), and answers to pre-lab questions (but **not** assembly language programs)
- Show the TA that your code assembles properly.
- **Demonstrate your understanding** of the code you brought and the lab topics in general.
- If you fail at any of the above, you will get a zero for the lab and will be asked to leave. You may **not** make-up this lab later. Therefore, **it is imperative that you come to lab prepared!**
- **Note:** The best students have everything working **BEFORE** coming to lab.

LABORATORY RULES

All grades are **non**-negotiable **one week** after the grade is assigned. Please don't come to me after the final grades have been posted with a hard-luck story.

1. No food, no drinks, and no smoking inside the Lab!
2. Keep your work area neat and clean it before you leave.
3. Students must attend labs during their assigned time.
4. No extra time will be given for those who cannot finish the experiment in the stipulated time.
5. Quizzes might take as long as 1 hour (but could be shorter). Quizzes will be graded on a quaternary (also known as a quadrary) scale of 0, 1, 2 or 3. This will translate into values of 0, 10%, 15%, or 20%, respectively to account for up to 20% of the lab grade. Quizzes will cover information from the pre-lab material and previous labs and course work.
6. **Labs are precisely 3 hours long (or less, see LABORATORY ENTRY above). You will be given no extra time.**
7. **You must show up within 30 minutes of the lab starting time for check-in. (See above for check-in information.)** . If you are more than 10 minutes late, you will get a zero for the lab quiz.
8. **The last 20 minutes of the lab is a time for student check-off and grading only. The TA is not available for questions during this time.**

LABORATORY ATTENDANCE

Laboratory attendance during scheduled times is mandatory. **Documented** personal or family emergency will be accepted as an excuse for absence for a **second** missed lab if documentation for a **first** missed lab is **also provided**. In such cases, consult your **instructor** (**not** your TA) about a make-up lab ***as soon as possible***. See ***Course Requirements*** for more details. Students should make serious attempts on **all** labs. Grades less than 50% may be interpreted as not a serious attempt and may be scaled to 0.

You will not officially makeup your first missed lab. You should do this missed lab at home (or, if necessary, during a TA office hour) to be sure you understand the required material.

If you cannot finish the laboratory during the allotted time, you will lose at least 10% to 30% off your final score. You are expected to finish the labs on time. The most successful students generally get their labs to work **at home before** their lab begins.

END OF LABORATORY SUBMISSIONS

The answer to your **in-lab** questions must be turned in at the end of your lab period.

LABORATORY PREPARATION LIST

1. **Always compose, edit, assemble, and print your programs before your scheduled lab.**
   - *This will save you considerable time and frustration and will improve your performance. In addition, you will have a legible working document.*
2. **Structure your program into functional modules and comment the modules as part of the coding.**
   - *Each subroutine should perform just one function. If a subroutine extends beyond 40 instructions, it is probably doing more than one function and should be split into two or more smaller subroutines.*
3. **Devise means for testing each subroutine separately so that problem isolation (debugging) is easily accomplished. Assemble the *entire* program using our *assembler*.**
   - *These tests should be made as part of your pre-lab preparation.*
   - **Simulate your program with the *simulator* or debug it on your board *before* coming to Lab. Bring to your lab your *working* assembly code and circuit diagram file (if any) on your laptop. Bring a printout of the list file to the lab and circuit diagrams (if any). You will not be allowed in the Lab without a commented listing of your code and a circuit diagram (when relevant).**
4. **Arrive at the lab on time to give yourself adequate time.**

EEL 4744 LABORATORY SCHEDULE

Lab	Start Date	Tentative Lab Topics (Lab in NEB 281)
0	Tues, 17 Jan	Circuit board construction begins
1	Thur, 26 Jan	GCPU program
2	Thur, 2 Feb	TI F28335 program. Simulate program. Download code. Hardware emulation.
3	Fri, 10 Feb	Use switches and LEDs. Bus Timing using LSA
4	Mon, 12 Mar	I/O Port & Keypad
5	Tues, 20 Mar	External Memory, Asynchronous Serial Communication (SCI), Interrupts
6	Wed, 28 Mar	A-to-D Conversion (for voltmeter with LCD)
7	Mon, 9 Apr	Output Compare (making music)
8	Mon, 16 Apr	Signal Timing: Input Capture (using remote controls)
	Extra credit?	

EEL 4744 SCHEDULE (Part 1 of 2)

WEEK/DAY	DATE	HW	LAB #	Quiz	Class #	Comments
2 M	9-Jan					Classes Begin
2 Tu	10-Jan				1	
2 W	11-Jan					
1 Th	12-Jan				2-3	
1 F	13-Jan					
2 M	16-Jan		~~0~~		No class	**Holiday: Martin Luther King Jr. Day**
2 Tu	17-Jan		0		4	
2 W	18-Jan		0			
2 Th	19-Jan		0		5-6	
2 F	20-Jan		0			
3 M	23-Jan		0			
3 Tu	24-Jan		~~1~~		7	
3 W	25-Jan		~~1~~			
3 Th	26-Jan		1		8-9	
3 F	27-Jan		1			
4 M	30-Jan		1			
4 Tu	31-Jan		1		10	
4 W	1-Feb		1			
4 Th	2-Feb		2		11-12	
4 F	3-Feb		2			
5 M	6-Feb		2			
5 Tu	7-Feb		2		13	
5 W	8-Feb		2			
5 Th	9-Feb				14-15	
5 F	10-Feb		3			
6 M	13-Feb		3			
6 Tu	14-Feb		3		16	
6 W	15-Feb		3			
6 Th	16-Feb		3		17-18	
6 F	17-Feb					
7 M	20-Feb					
7 Tu	21-Feb				19	
7 W	22-Feb					**EXAM 1: Wed, 22 February, 5:10pm, in LAR 310**
7 Th	23-Feb				20-21	
7 F	24-Feb					
8 M	27-Feb					
8 Tu	28-Feb				22	
8 W	29-Feb					
8 Th	1-Mar				23-24	
8 F	2-Mar					
	4-9 Mar				No class	**Holiday: Spring Break**

EEL 4744 SCHEDULE (Part 2 of 2)

WEEK/DAY	DATE	HW	LAB #	Quiz	Class #	Comments
9 M	12-Mar		4			
9 Tu	13-Mar		4		25	
9 W	14-Mar		4			
9 Th	15-Mar		4		26-27	
9 F	16-Mar		4			
10 M	19-Mar					
10 Tu	20-Mar		5		28	
10 W	21-Mar		5			
10 Th	22-Mar		5		29-30	
10 F	23-Mar		5			
11 M	26-Mar		5			
11 Tu	27-Mar				31	
11 W	28-Mar		6			
11 Th	29-Mar		6		32-33	
11 F	30-Mar		6			
12 M	2-Apr		6			
12 Tu	3-Apr		6		34	
12 W	4-Apr					
12 Th	5-Apr				35-36	**EXAM 2: Thursday, 5 April, 5:10pm, in NEB202**
12 F	6-Apr					
11 M	9-Apr		~~7~~			
11 Tu	10-Apr		~~7~~		37	
11 W	11-Apr		~~7~~			
11 Th	12-Apr		~~7~~		38-39	
11 F	13-Apr		~~7~~			**DROP DEADLINE**
11 M	16-Apr		7, 8			
11 Tu	17-Apr		7, 8		40	
11 W	18-Apr		7, 8			
11 Th	19-Apr		7, 8		41-42	
11 F	20-Apr		7, 8			
12 M	23-Apr					
12 Tu	24-Apr				43	**EXAM 3: Tues, 24 April, 5:10pm, in MCCC 100**
12 W	25-Apr					Classes End
	3-May				Final	**NONE!** (Schedule for 3-5pm in MAEB 211)