Communication Engineering Lab

ECE 461 – Fall 2009

Lab location: ENGR 3505
Lab Hours: Mondays, 10:30 am - 1:20 pm
Credit Hours: 1
Corequisite: ECE 460, Communication and Information Theory

Lab instructor: Vasiliki N. Ikonomidou
E-mail: vikonomi@gmu.edu (preferred)
Office: Engineering, 3909
Office Hours: Monday 5-6 pm; Tuesday 10-11 am; other hours by appointment (e-mail me!)

Regarding communication:

I will try to respond to e-mails within two business days of receiving them. Due to University regulations, you need to use your GMU e-mail account in all correspondence related to the course. Please put ECE 461 in the subject line!

Grading policies

(a) Attendance and lab demonstration – 10%

Attendance to the lab sessions is mandatory. Students must complete and successfully present all the experiments in order to pass the course; students with one lab exercise not completed can still pass the course with an additional 5% penalty. Students with two or more not completed exercises will fail the course.

If you must miss a session, notify the instructor by e-mail as soon as possible stating the reason for your absence. A common make-up session to cover for a single absence will be offered towards the end of the semester. If due to medical reasons you must miss more than one session, please contact me for alternative arrangements.

Successfull attendance to the lab comprises of being there on time, being prepared and actively participating to the experiments. A successful presentation of the experiment includes a presentation of the experimental setup, the code and the measurements, and an understanding of the nature of the measurements.
In order to keep track of attendance and presentations, a signature sheet will be provided to you. It is your responsibility to get the instructor’s signature on this sheet for every lab successfully completed, and to turn this sheet in with your final exam.

(b) Lab reports – 40%

Lab reports constitute a major component of the course. They should demonstrate an understanding of the background, and a clear and critical presentation of the procedure followed and the results obtained. “Critical” means questioning what was done and why such results were obtained.

Lab reports should be typed, and no longer than 5 pages.

Lab reports are due at the beginning of the class the week after the experiment was completed; there will be a 10% penalty for every day delay after that. In case of a documented medical emergency that doesn’t allow you to submit the report on time, please notify the instructor.

(c) Midterm exam – 25%

The midterm exam will consist of a theoretical (pen and pencil) part and an experimental demonstration. Both parts are open notes/book.

(d) Final exam – 25%

The final exam will consist of a theoretical (pen and pencil) part and an experimental demonstration. Both parts are open notes/book.

Academic Integrity

All George Mason University students have agreed to abide by the letter and the spirit of the Honor Code. You can find a copy of the Honor Code at academicintegrity.gmu.edu. All violations of the Honor Code will be reported to the Honor Committee for review.

In this lab, you will work in pairs. It is expected that you will collaborate in conducting the experiment, and that you will discuss problems that arise with your partner. It is also expected that you will present the same lab results as your partner. However, it is not acceptable that one partner conducts all the experiment; both students should share the work in the experimental procedure. It is also expected that you write the report on your own; the answers to the questions of the lab manual should reflect your own understanding of the subject.

Academic courtesy / Lab rules

Please familiarize yourself with the laboratory rules of the ECE department.

- No food or drinks are allowed in the lab
- Students are not allowed in the lab without a Lab Instructor or Lab Monitor present
- Handle equipment with care. If you suspect there is a problem with the equipment, notify the Lab Instructor, the TA or the Lab Monitor.
• You are responsible for leaving your workstation clean and in good condition when you leave.
• Smoking is not allowed in the building
• Use of cell phones or mp3 players is not allowed during class

Make sure you dress appropriately for the lab. Wear shoes with insulating soles, and avoid jewelry. Practice the general rules of electronics safety.

While discussions between the lab partners are expected during the experimental part of the class (but not during lecture), please be considerate of your classmates and avoid excessive noise.

**Detailed Course Information**

This course aims at providing the student with hands-on experience in analog and digital communication systems. For the first part of the course, basic analog modulation circuits will be build and the associated modulations studied both in the time and the frequency domain. For the second part of the course, a DSP-based kit will be used to construct subsystems of a digital communications system.

**Lab manual:**

The manual for the lab exercises will be available in pdf format on Blackboard.

**Recommended textbooks:**

The lab notes make references to the required textbook of ECE 460, Communications Systems Engineering by Proakis and Salehi.

Louis E. Frenzel, Principles of Electronic Communication Systems, Career Education.

The ARRL handbook for radio communications, ARRL – the national association for amateur radio


In the lab manual, you will find references to datasheets of ICs used – you are expected to download them from the companies’ websites and read them.

**Materials required:** A materials list will be provided with all lab exercises. Each student will be assigned a TMS320C6711 DSK kit, which he/she will be held responsible for, and will need to return at the end of the semester.

**Calendar (tentative – ALL dates and assignments are subject to change)**

Aug 31 – Introductory class – first day of the semester

Sep 7 – Labor Day, no class
Sep 14 – Lab exercise 1: Spectrum analysis and transfer function
Sep 15 – Last day to drop without tuition penalty
Sep 21 – Lab exercise 2: Amplitude modulation
Sep 28 – Lab exercise 3: Balanced modulator
Oct 2 – Last day to drop with no academic liability
Oct 5 – Lab exercise 4: Frequency modulation
Oct 12 – Colombus day, Monday classes and labs meet Tuesday
Oct 13 – Lab exercise 5: Phase locked loop
Oct 19 – Midterm exam
Oct 26 – Lab exercise 6: Introduction to TMS320C6711
Nov 2 – Lab exercise 7: Digital filters
Nov 9 – Lab exercise 8: TBD
Nov 16 – Lab exercise 9: TBD
Nov 23 – Lab exercise 10: TBD
Nov 30 – TBD
Dec 7 – Final exam