Missoula College UM  
Department of Applied Computing and  
Electronics  
Course  
Syllabus

Wireless Communications ETEC 270  
Credits: 4  
Prerequisites: ETEC 250 Solid State Electronics I  
Term: Autumn 2014

Meetings:  
Lectures Mon, Wed & Fri 1:10PM – 2:00PM; Labs Tue 1:10PM to 3:00PM  
Classroom: HB05

Final Exam:  
Tuesday December 9, 2014 from 1:10PM to 3:10PM in HB05

Faculty Contact:  
Steve Shen – steve.shen@umontana.edu Phone: 406-243-7914  
Office Hours: Mondays and Wednesdays 12:00PM to 1:00PM  
Thursdays 3:00PM to 4:00PM

Course Description:

ETEC 270 Wireless Communications 4 cr. Offered Autumn. Prereq., ETEC 250. Explores audio and radio frequency (RF) circuits. Topics include AM and FM signal modulation and demodulation, RF transmitters, RF receivers, RF amplifiers, audio amplifiers, oscillators, mixers, and antennas. Includes hands-on labs.

Course Overview:

Most of the discussion of new topics, reviews and lab activities will take place in the classroom-lab. Some of the student’s activities will have to take place outside of the classroom. Lab write-ups, some written homework and/or take-home quizzes will be assigned throughout the semester. Students are advised to read ahead in the text and lab books to prepare for new topics, and to review material already covered in class. Note taking is strongly encouraged with particular emphasis on definitions of terms and the new schematic symbols, formulas, and solved problems that use those formulas. These will almost always be included on the tests given at the end of each chapter. We will be covering the first 7 chapters, and chapters 10 and 14(if time allows) in the text and do many of pertaining labs to each chapter. This course also includes an AM-FM radio kit build project. This is built in segments with performance tests and measurements throughout the build. When completed the students should be able to tune in the 4 Missoula AM channels and at least 4 of the FM channels.

Please note the lab portion of this course is included under the one course heading.

Course Objectives:

Upon completion of this course students will:

- Be able to describe general circuit configurations for Audio and RF Amplifiers  
- Understand the characteristics of AM modulation and detection.  
- Understand the characteristics of FM modulation and detection.  
- Be able to describe signal levels in terms of decibels  
- Be able to calculate RF signal wavelength  
- Have a general understanding of digital communication techniques
• Have a general knowledge of radio transmitters
• Have a general knowledge of wireless communication receivers
• Know how to read and understand the frequency spectrum chart
• Have a basic understanding of how to calculate antenna dimensions and RF wavelength for specific frequencies
• Successfully construct a functioning AM-FM radio during their lab exercises. Two thirds credit for successfully completing the assembly segments and passing the performance tests and measurements given in the manual. The full one third of the remaining credit is awarded for successfully receiving 4 AM and 4 FM radio stations.

Required Materials:


ETEC 270 Parts kit (available in the Bookstore)

Apaco AM-FM Radio kit (available in the Bookstore)

Evaluation Procedures:
Grades will be assessed as follows: Assessment Area:
Attendance 5%
Homework Assignments 15%
Midterm Exam 20%
Final Exam 30%
Lab Experiments 15%
AM-FM Radio Project 15%

Grading Scale:
90-100% A
80-89% B
70-79% C
60-69% D

General Requirements for the Course
1. All the assigned lab experiments and projects are to be done with physical components, unless otherwise indicated by the instructor.
2. Multisim simulations are required for some of the lab experiments.
3. Please demonstrate every lab experiment and project to the instructor as soon as you complete them.
4. Late work may be accepted at most one week after the due date and can receive a maximum of 80% of the full credit.
5. No work will be accepted one week after the due date, or after the solutions have been gone through.
6. No work will be accepted after the final week of the semester.

Academic Integrity:
All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code. The Code is available for review online at: http://life.umt.edu/vpsa/student_conduct.php

Using the Web to research materials and concepts is an integral part of learning in the
twenty-first century. Studying with other students is a productive method of learning. A certain amount of collaborating on concepts with other students and using resources found on the Internet in an assignment is recommended. Copy and paste is not acceptable. It is expected that each student will input his/her assignment into the computer, and each student must be able to explain any assignment turned in. Collaboration on exams is strictly forbidden.

**Dropping and Adding Courses or Changing Sections, Grading or Credit Status**

University Policy for dropping courses or requesting grading/credit status changes can be found in the catalog: [http://www.umt.edu/withdrawal/Withdrawal%20Policies.aspx](http://www.umt.edu/withdrawal/Withdrawal%20Policies.aspx)

Students should become familiar with all academic policies.

**For Complete Academic Policies Please View the Um Catalog at:**

**Disability Accommodations:**

Eligible students with disabilities will receive appropriate accommodations in this course when requested in a timely way. Please contact me after class or in my office. Please be prepared to provide a letter from your DSS Coordinator. For more information, visit the Disability Services website at [http://www.umt.edu/dss](http://www.umt.edu/dss). Or call 406.243.2243 (voice/text).

**Changes to Syllabi:**

NOTE: Instructor reserve the right to modify syllabi and assignments as needed based on faculty, student, and/or environmental circumstances. If changes are made to the syllabus, amended copies will be dated and made available to the class.

**Cell Phone and other Electronic Communication Devices Policy:**

All electronic communication devices must be tuned off and stowed away prior to the start of class.

**Attendance Policy:**

Regular classroom attendance is expected.

**Exam, Project, and Assignment Policy:**

All exams are to be taken on the assigned date and time. Projects and assignments are due at the start of class on the assigned date and time. Late assignments will be accepted at the instructor’s discretion. Rescheduling of an exam will be approved at the discretion of the instructor and only in extraordinary situations.

**Learning Management System:**

It is the responsibility of the student to access and familiarize herself/himself with the Learning Management System (LMS) for the course (Moodle). Access & training is available through UMOnline [http://umonline.umt.edu](http://umonline.umt.edu)

**Topic Outline** (tentative):

1. Fundamental Communications Concepts
2. Amplitude Modulation
3. Angle Modulation
4. Communications Circuits
5. Transmitters
6. Receivers
7. Antennas
8. Digital Communications Techniques
9. Wireless Communications Systems