Course Number and name: ET 314 Communication Systems I

Credits & Contact Hours: ET 314 is a 2+2p class. Each week has two lectures of 50 min Total semester contact hours are approximately 45 hr. The accompanying laboratory is a 2p lab and meets for 1hr and 40 min each week

Instructor's name: Michael Morrell

Textbook: Modern Electronic Communication, 9th edition, by Jeffrey S. Beasley and Gary M. Miller.

Specific Course Information:
　　　Course Catalog Description: Circuits and devices used for transmission, reception, and processing of RF signals.
　　　Prerequisites: ET 246
　　　This course is required for ECET majors.

General Course Goals: The circuits and devices used for the transmission, reception, and processing of RF signals. Topics include the dB in communication, FFT basics, AM, FM, Digital transmission/communication techniques, spread spectrum, A/D and D/A conversion, modern telephony, cellular and PCS operation, basic antenna theory, NTSC and digital television, and fiber optics.

Related ABET Objectives and Outcomes: The department of Engineering Technology has an objective of having its graduates possess the following skills and knowledge.

1. Digital circuit **analysis and design techniques, analysis of analog and digital electronics**, architecture and applications of microcomputer systems, local area networks, and the **building, testing, operation and maintenance of electronic,** instrumentation, **communications**, control, and/or computer systems (both hardware and software). Also ABET 2.b, 2.c, 2.d, 2.f

3. **Project management techniques and teamwork necessary for successful electronic and/or** computer system **designs and implementations, and the effective use of communication skills to prepare technical reports, memos, and presentations.** Also ABET 2.b, 2.c, 2.d, 2.f

Methodology: The course objectives will be met through reading assignments, lectures, and applications (laboratory and homework assignments - 1,2,3,4,6 above). ABET objective 7 will be met through the preparation of the reports to the supervisor. Much of the work will be done in groups (5,7) and these groups will change in membership so that there is a diversity of ideas, personalities, etc. (10). Professional ethics are stressed in class, and students are expected to have a high level of personal and professional ethics(8,11). Each laboratory requires the student to submit written lab materials. Problem-solving skills are demonstrated via homework and on-line assignments, and the Cisco Module Assessments. These are graded as to technical accuracy and timely presentation (1,2,3,4,5,6,7,8,9,10,11) .

Course topics and lecture hours devoted to each topic:

TOPICS	HRS.
Introduction	1
dB in Communications	2
Information and Bandwidth	1
Amplitude Modulation	2
Frequency Modulation	2
Frequency Conversion	2
Frequency Synthesis	1
Digital Signal Encoding Formats	2
Code Error Detection and Correction	2
Coding, Sp0read Spectrum Communications	2
OFDM	1
Serial Communications	1
Cellular Communications	2
Data Transmission	1
Transmission Lines, SWR, Smith Chart	2
Antennas	2
Fiber Optics	2
Exams	2
Total	**30 hrs**

Computer Usage: The use of software Electronics Workbench Multisim in Communications Systems is introduced and the students are required to utilize their projects.

Laboratory Projects: Each laboratory class is one block of 1 hour and 40 minutes per week. Laboratory exercises are done once each week in conjunction with the text readings and the lecture materials. The laboratories are designed to apply the theory with the application of electronic communication circuits and concepts. Students must construct an AM receiver, an FM transmitter, and construct digital communications system.

Equipment utilized by the students include (but is not limited to): Soldering tools, communication printed circuit board population, oscilloscopes, signal generators, and multimeters.

Example of topics for laboratories include:

- dB in Communication
- Using the Spectrum Analyzer
- Percentage of Modulation of an AM Waveform
- AM Broadcast Transmitter Kit
- FM Transmitter Kit
- AGC Circuit Demonstration
- RF Data Transmission Project

Prepared by: Jeff Beasley   Date: 10/6/10