

Eastern Kentucky University
Department of Technology

Syllabus for EET 257-001, Circuits and Electronic Devices, 10759
3 credit hours
Fall 2009

Instructor:

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Class schedule:

Section 001, CRN: 10759; MW: 11 a.m.- 12:55 p.m., in Room 407/400

Office Hours:

MTWR: 9:30 a.m.-11 a.m., and 4:30 p.m.- 6 p.m. If my office door is open at other times I will most likely be available for discussion. Come right in. You may email me regarding additional meeting times if needed.

CATALOG COURSE DESCRIPTION:

Electrical circuits and theorems. A technical analysis of the characteristics of solid state devices and the common circuits that utilize these devices. Emphasis on problem solving supplemented by laboratory analysis of electronic circuits and devices. 2 Lec/2 Lab.

Prerequisite:

EET 251 (Electricity and Electronics)

TEXTS:

The material covered in-class using a combination of lecture, demonstration and laboratory activities will serve as the main source of information for EET 251. Links to supplementary online sources and instructional material will be made available through Blackboard.

Reference:

- Patrick, D. R., & Fardo, S. W. (2002). *Electricity and Electronics: A Survey* (5th ed.). New Jersey: Prentice Hall.

STUDENT LEARNING OUTCOMES:

Upon successful completion of this course the student will be able to:

1. Explain of the fundamental theories which form the foundation of semiconductor electronics.
2. Sketch the symbols of different electronic devices and standard electronic circuit configurations.
3. Use manufacturer's technical literature for determining the specifications of various electronic devices and utilize this literature for analyzing electronic applications.
4. Determine the voltages, current and power in standard electronic circuit configurations.
5. Maintain proper safety precautions while handling and using electronic devices.
6. Test electronic devices using proper instruments and procedures.
7. Build solid state amplification and power control electronic circuits.
8. Simulate electronic circuits using circuit simulation software.

COURSE OUTLINE:

1. Electronic basics (Week 1-2)
 - a. Review of Basic Atomic Theory
 - b. Review of Current Flow Theory
 - c. General Device Analysis
 - d. Semiconductor Principles
 - e. P-N Junctions and the Basic Diode
 - f. P-N Junctions and Special Diodes, photodiodes
2. DC Voltage and Current Regulation and Rectification (Week 3-8)
 - a. Rectification and the Diode Bridge
 - b. Filtering
 - c. Voltage Regulation
 - d. Fixed Voltage Regulators
 - e. Variable Voltage Regulators
 - f. Current Regulation
 - g. Power supplies
3. Amplification Devices and Circuits (Week 9-13)
 - a. The Bipolar Junction Transistor (BJT)
 - b. The Bipolar Junction Transistor Amplifiers
 - c. The Junction Field-Effect Transistor (JFET)
 - d. The Metal-Oxide Semiconductor Field-Effect Transistor (MOSFET)
 - e. Linear and differential Amplification
 - f. Operational Amplifiers
 - g. Amplifier gain
4. Power Switching (Week 14-16)
 - a. The silicon controlled rectifier (SCR)
 - b. DC switching
 - c. AC switching
 - d. Parallel SCR's
 - e. The Diac and Triac
 - f. Unijunction Transistors

EVALUATION METHODS:

Each student will be evaluated as follows:

- Assessments (40%) – 3, including the final
- Laboratory (35%) – 12-15 (approx.)
- Power Supply project (15%)
- Assignments (10%) – 8-10 (approx.)

1st assessment – (in-class, objective/short answer format), covering class notes, labs, assignments, and classroom discussions related to electronics basics, DC voltage regulation and rectification. To be held during the 6th week (Sept. 28-30) of the semester.

2nd assessment – (in-class, objective/short answer format, one side of a 3 in. x 5 in. index card of handwritten notes permitted), covering class notes, labs, assignments, and classroom discussions related to amplification systems. To be held during 12th week (Nov. 9-13) of the semester.

Final Assessment – (in-class, objective/short answer format, with both sides of a 3 in. x 5 in. index card of handwritten notes permitted) – **Comprehensive**, covering class notes, labs, assignments, and classroom discussions. To be held Tuesday, Dec. 15, 10:30 a.m.-12:30 p.m.

You may rework and resubmit your assessments (except the final), paragraphs or labs for limited partial credit. Labs and paragraphs turned in late will have reduced credit.

The EET257 class portfolio will be useful in organizing your learning – maintain separate sections for notes, laboratory activities, assessments, and reference materials. The portfolio is to be brought in at the time of the final for evaluation.

Power Supply project:

A variable DC power supply will be constructed in class. The working power supply, along with a well documented report, counts for 15% of the final grade. Multisim simulations of the power supply may be included with the report. The paper should be formatted using American Psychological Association (APA) guidelines. These guidelines are available online at <http://nutsandbolts.washcoll.edu/apa.html>. The paper should include at least two references. If online sources are used, the reference should also include a persistent link to the article when possible. Refer to the Academic Search Premier Database (<http://www.library.eku.edu/new/index.php>) which is available for both on- and off-campus use through the ECU libraries, for identifying articles related to the topic. An online video tutorial on using the ECU library databases for retrieving articles is available at: <http://www.people.eku.edu/chandrav/Ref/onlineArticlesEKU.wmv>.

Course Requirements:

Students are expected to:

1. Attend each lecture and laboratory session.
2. Complete all homework submit these on the prescribed dates.
3. Complete assigned labs and simulations as prescribed by the instructor.
4. Complete the assessments covering material from the assignments, labs, and classroom discussions.
5. Maintain a 3-ring binder or folder for organizing class and reference materials

Grades:

100-90% = A

89.9-80% = B

79.9-70% = C

69.9-60% = D

Below 60% = F

Mid-term grades will be made available to students by Friday, Oct. 16, 2009.

Tuesday, Dec. 22, 2009 – Final grades available online

STUDENT PROGRESS:

Students will be informed of their progress in the course after the 1st assessment (approximately 6th week of the semester). All students are encouraged to meet with me and discuss their and identify opportunities for improvement at any time during the semester.

Sunday, Aug. 30, 2009 – End of Add/Drop period: Last day to drop a full semester course without a "W" appearing on the university transcript, last day to register for or add additional full-semester courses. Last day to convert "Pass/Fail" or "Audit" classes to a normal grade and credit option. Completed forms must be returned to: Registrar's Office (SSB 239), or Corbin, Danville, or Manchester centers.

Friday, Sep. 11, 2009 – Last day to convert a class from credit with normal grade to "Pass/Fail" or "Audit". Completed forms must be returned to: Registrar's Office (SSB 239), or Corbin, Danville, or Manchester centers.

Last Day to Drop the Course: Friday, Oct. 30, 2009 – Last day to withdraw with a "W" from a full-semester class, or to withdraw from full-semester classes or withdraw from the university.

ATTENDANCE POLICY:

Regular attendance is needed for students in order to successfully complete the course. After the second unexcused absence, each unexcused absence will cause two percent deduction in the overall percentage. Five (5) and seven (7) unexcused absences will result in one letter grade lower each. Your grade will be an automatic F if you have more than seven (7) unexcused absences. If you have a university accepted excused absence, make-up work is permitted with no penalty. Makeup labs/exams will be permitted only if you had sought and received my approval prior to the absence which caused you to miss the related lab/exam. You will benefit most by way of understanding the content of the course by completing all the assigned work in a timely manner. If you know in advance that you will be absent, please inform me at the earliest. Email is usually the fastest way of contacting me.

Cell Phones:

Cellular phones should be off or on silent ring during class in order to keep classroom distractions at a minimum. Under special circumstances students are permitted to use the phone but should seek my approval prior to class.

DISABILITY STATEMENT:

If you are registered with the Office of Services for Individuals with Disabilities, please obtain your accommodation letters from the OSID and present them to the course instructor to discuss any academic accommodations you need. If you believe you need accommodation and are not registered with the OSID, please contact the Office in the Student Services Building Room 361 by email at disserv@eku.edu or by telephone at (859) 622-2933 V/TDD. Upon individual request, this syllabus can be made available in an alternative format.

ACADEMIC INTEGRITY STATEMENT:

Students are advised that EKU's Academic Integrity policy will strictly be enforced in this course. The Academic Integrity policy is available at www.academicintegrity.eku.edu. Questions regarding the policy may be directed to the Office of Academic Integrity.

OFFICIAL E-MAIL:

An official EKU e-mail is established for each registered student, each faculty member, and each staff member. All university communications sent via e-mail will be sent to this EKU e-mail address.

☺ The work you do in the laboratory, and the grade you earn, should reflect your personal abilities, and accomplishments. Individual homework and lab reports are required from each student. I encourage you to discuss class assignments with other students. However any work you submit must be your own.

☺ Any suggestions leading to improvements in the content or presentation of the course, especially in the laboratory work, are most welcome.

EKU will develop informed, critical & creative thinkers who communicate effectively.

(EKU Quality Enhancement Plan, 2009)