EE 349 Electronic Circuits I

Northern Arizona University
College of Engineering and Technology

Fall 2001 Section 01 Sequence 40353 MWF 12:40 PM – 1:30 PM Rm 245, Bldg 69

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Office Hours: TuTh 11:10 – 12:25
WF 1:50 – 2:40
other times by appointment

CATALOG DESCRIPTION: Analyzes analog and digital electronic circuits. Emphasis on diode circuits, nonlinear op-amp circuits, NMOS, CMOS, and TTL logic gates. 3 hrs. lecture, 3 hrs. lab.

PREQUISITES: EE239 *Electrical Engineering II*

COREQUISITES: CSE 247 *Introduction to Digital Logic*

PREREQUISITE SKILLS:

1) Circuit Analysis Techniques for DC, steady state AC, and transient conditions
2) Thevenin and Norton Equivalents
3) Circuit modeling (Pspice)
4) Use of laboratory equipment (DMM, DSO, function generator)

TEXTS: *Microelectronic Circuits*, 4th edition, by Sedra and Smith, Oxford University Press, ISBN 0-19-511663-1 (required)

Schematic Capture With Cadence PSpice, by M.E. Herniter Prentice Hall, ISBN: 0-13-027694-4 (recommended)

OTHER MATERIALS: A laboratory parts kit is required and may be purchased from the IEEE student organization. A formal laboratory notebook is required and may be purchased at the NAU bookstore.

ABET: This course contributes 2 credits of engineering topics and 2 credits of design to the ABET Professional Requirements.

TEACHING PHILOSOPHY: Topics will be covered in three stages: theoretical analysis, simulation, and laboratory verification. The theoretical analysis of the circuit is covered to develop an understanding the operation of the circuit or to design a circuit. Circuit simulation using industry standard analysis tools is then used to verify the theoretical analysis or circuit design. When the simulations reasonably agree with the theoretical analysis, the circuit is constructed in the lab. Measurements of the circuit performance are made and compared to the theoretical calculations and simulation results. Cooperative learning is encouraged by the use of team quizzes.

COURSE OBJECTIVES: Upon successful completion of this course, each student will have the capability to:

- Analyze the operation and performance of basic electronic switching and non-linear circuits.
- Design basic electronic switching and non-linear circuits to meet specified operation and performance requirements.
- Verify circuit operation and performance using a circuit modeling/analysis program.
- Build, test, and evaluate circuit operation and performance in the laboratory.

TOPICS:

Diode devices and circuits
Zener devices and circuits
Power supplies
Operational amplifier limitations
Timer, comparator, and oscillator Circuits
Digital circuit basics
MOS devices and circuits
BJT devices and circuits

TENTATIVE SCHEDULE:

09/26/01 – Exam #1
10/17/01 – Exam #2
10/26/01 – last W day
11/07/01 – Exam #3
11/30/01 – Exam #4
12/10/01 – Final Exam, 12:30 PM – 2:30 PM

STUDENT RESPONSIBILITY - Students are responsible for their learning and should actively participate in class discussions, ask questions, ask for assistance or clarification, challenge information that does not seem reasonable, provide feedback to the instructor on how to improve the class, and work with other students in the class to strengthen their understanding of the material. Attendance is required, as well as keeping up with reading and homework assignments. If you miss a class, you should contact another student in the class to obtain class notes and assignments.

COURSE GRADING - Grades will be determined by the relationship of the points earned to the total points possible. An average of at least 50% in each of the following categories is required to earn a passing grade in this class; once this condition is met, the course grade will be determined by combining the scores in all categories using the following weights. A minimum of 60% of the total possible lab points must be achieved to obtain a grade of C or better in the course.

Homework Quizzes	15%
Group Quizzes	10%
Midterm Exams	35%
Final Exam	15%
Laboratory	25%

The weighted total class percentage scores will be converted to letter grades as follows:

A	90% - 100%
B	80% - 89%
C	70% - 79%
D	60% - 69%
F	less than 60%

ATTENDANCE AND CLASS DISCUSSIONS – You should complete reading assignments and be prepared to discuss the material in class and respond to questions. Class participation is important. If you are going to miss class, you must notify me ahead of time and provide a legitimate reason; otherwise the absence will not be excused.

READING ASSIGNMENTS – Material from the text will be assigned each class meeting to be read prior to the next meeting. Questions related to the material will be assigned and selected questions will be part of the homework quizzes.

HOMEWORK – Homework will be in two forms: problems and questions related to the current reading assignment, with due dates ranging from the next class meeting up to one week later; no homework will be due on exam days.

Questions on the reading assignment and end-of-chapter problems will be assigned to give you an opportunity to learn and practice the course material by doing analysis and calculations. On the due date, one or both of the following will occur:

1. The homework papers will be collected.
2. A homework quiz will be given, consisting of a sampling of the reading questions and assigned problems, but with different given values. You may use your homework solution papers during the quiz, but no other materials are allowed. Partial credit will not be given. Make-up homework quizzes will be available only in cases of excused absences.

GROUP QUIZZES – Quizzes will be given (except exam days) to measure your understanding of the material. These will be group quizzes, on which you may work in groups of up to three students. Each group will turn in only one copy of the quiz paper, with the names of the team members; each of the team members will receive the same quiz grade. There will be no make-up group quizzes.

MIDTERM EXAMS – Four midterm exams will be given, each covering approximately 25% of the material covered in the course. Unless otherwise announced and indicated on the exam, you will be allowed to use only the reference material provided with the exam. When appropriate, scores on a exam may be adjusted upward based upon the instructor's evaluation of the general class performance and the class average for the exam; other than this adjustment, there will be no adjustment of grades to fit a "curve."

If you are going to miss an exam, you must notify me ahead of time; you can call at 523-4648. Contact me as soon as possible to arrange for a make-up exam.

FINAL EXAM – The final examination will be cover all material contained in this course. The examination will follow the same ground rules as the midterm tests and is mandatory for each student.

LABORATORY

SCORE ADJUSTMENTS – Students that participate in the all of the on-line course and teaching evaluation surveys for this course will be eligible for the following adjustments to homework, group quiz, and exam scores. These adjustments are not available to students that fail to participate in the on-line evaluation surveys, and there will be no other score adjustments.

- The four lowest scores on homework quizzes will be dropped.
- The four lowest scores on group quizzes will be dropped.
- Your lowest midterm exam score will be replaced by the score received on your final exam if it is higher.

WEB PAGE – **http://jan.ucc.nau.edu/~jmh/EE349** - Class materials such as reading and homework assignments, and group quiz, homework problem, and exam solutions will be posted on the web page in .pdf files, suitable for printing or downloading. You will also use the web page to access your course score records. You will need your DANA ID and password to access the web page.

HONESTY – You are encouraged to study and discuss homework with other students in the class, but in no case shall you submit someone else's work as your own. NAU and College of Engineering and Technology academic honesty policies will be strictly enforced.

NOTIFICATION OF ABSENCES – Absences will generally be excused only if I am notified ahead of time by email, telephone, or in writing.

UNIVERSITY POLICIES – University policies (available as a separate handout) apply to this class.