EE321-Electronic Devices and Applications (Required Course)

Code and Name: EE 321 Electronic Devices and Applications
Credit Hours: 3 (Lecture: 3, Tutorial: 1)

Textbook:
- Microelectronics: Circuit Analysis and Design, D. A. Neamen, Fourth Edition, McGraw-Hill, 2010.

Other References:
- T. L. Floyd, Electronic Devices: Electron Flow Version, 9th Ed., Prentice Hall (Pearson Education Inc.), 2012.
- R. C. Jaeger and T. N. Blalock, Microelectronic Circuit Design, 4th Ed., Mc Graw Hill, 2011.
- S. Sedra and K. C. Smith, Microelectronic Circuits, 5th Ed., Oxford University, 2004.
- R. Boylestad and L. Nashelsky, Electronic Devices and Circuit Theory, 7th Ed., Prentice Hall.
- M. Tooley, Electronic Circuits: Fundamentals and Applications, 3rd Ed., Elsevier Ltd., 2006.
- Computer animations and online resources supplied by the instructor.

Course Description:
MOS and BJT Amplifier's frequency response. Multistage amplifiers. Differential Amplifiers. Digital logic families (ECL, and CMOS circuits). Operational Amplifiers. Linear and nonlinear op amp applications. Non-ideal characteristics of Op Amps. Oscillators. Active filters.

Pre-requisites: EE 223
Co-requisites: None

Course Learning Outcomes:
With relation to ABET Student Outcomes (SOs: 1-7)
1. Develop the general frequency response characteristics of amplifiers. (1)
2. Calculate correctly different parameters for various OP AMP circuits. (1)
3. Analyze various practical OP AMP circuits. (1)
4. Analyze and design power amplifiers, active filters, oscillators, and Schmitt trigger circuits. (2)
5. Analyze and design CMOS logic gates, ECL circuits, and multistage amplifiers. (2)
6. Illustrate using new technologies: submitted in Word and Power point in preparing their reports plus oral presentation. (3)

Topics to be covered:
- Course description, objectives, and content – Textbook and extra useful resources – Marks distribution – Policy.
- Operational Amplifiers (ideal/non-ideal – applications – differential stage– output stages).
- Active filters.
- Digital logic families.
- Oscillators.
- Amplifier frequency response.
- Multistage Amplifiers.

Grading Policy:
The grading for the course are 60% coursework and 40% Final Exam. The coursework consists of two Midterm Exams, where each midterm exam is worth 20%. It also includes quizzes, homework, and projects for the remaining 20% that is modified by the course instructor.