ENEE 303 - Spring 2011 Course Description

1. Course: ENEE 303 Analog and Digital Electronics
2. Time: MW 12:30-13:45
3. Place: Room CSI 1115
4. Instructor: R. W. Newcomb; Office: AVWII-1347; MSLab: AVW-1349 or AVW 1364
   Phones: Office: (301) 405-3662; Home: (301) 622-0177 (before 9:30pm)
   Office Hours: M 5-6pm, Tu 10:30-11,
   email address: newcomb@eng.umd.edu; URL: http://www.ee.umd.edu/newcomb/mslab.html
5. Teaching Assistant: F 9 & F 10, Vinie Somani email: vvomani@umd.edu
6. Prerequisite: ENEE 204 or consent of instructor; corequisit: ENEE 307
7. Textbook: A. S. Sedra and K. C. Smith, "Microelectronic Circuits," 6th Edition, Oxford University Press, NY, 2003, ISBN 978-0-19-532303-0 Recommended: K. C. Smith, M. Amiri, S. Mirabbasi, "Problem Supplement," G. W. Roberts and A. S. Sedra, "Spice," 2nd Edition, Oxford University Press, New York, 1997, ISBN 0-19-510842-6, J. O. Atia, PSPICE and Matlab for Electronics, CRC Press, Boca Raton, 2002. Recommended Programs: Spice (on the SUNS); evaluation versions of PSpice [version 8 on RWN web, 9.2 in textbook, latest from Cadence] for PCs; Student Version of MATH CAD and/or MATLAB
8. References: Journal Articles from: IEEE Transactions on Circuits and Systems, IEEE Journal of Solid-State Circuits, Electronics Letters, IEE Transactions, Solid State Electronics, International Journal of Electronics. Circuits Systems & Signal Processing. Useful books: R. C. Jaeger and T. N. Blalock, "Microelectronic Circuit Design," McGrawHill, NY, B. Razavi, "Fundamentals of Microelectronics," Wiley, NJ, 2008, M. H. Rashid, "Microelectronic Circuits," Cengage, CT, 2011, J. O. Attia, "PSpice and Matlab for Electronics," CRC Press, Boca Raton, 2010..
9. Course files: (when installed) Useful information and files can be seen and downloaded from the course section web address:
   http://www.ee.umd.edu/newcomb/courses/spring2011/303/ENEE303_spring2011.html
10. Course Description: This course covers the key ideas of microelectronic circuit design at the transistor level with an emphasis upon computer aided design of some digital and analog circuits. Treatment is intended to emphasize design including testing. Students are expected to get a good working knowledge of the important phases of microelectronic circuit design as well as how to present their designs to the electrical engineering community. The laboratory 307 is run in conjunction with the 303 course material.
11. Course Operation: Lectures and discussions will occur at the lecture and discussion class periods, including some computer demonstrations. Each student will design a circuit from a chosen journal paper. Early in the course each student will choose a journal article (see References above) and proceed to design and simulate that circuit. In the end this will involve two oral presentations, a first one on the theory of the circuit's operation and a second one on its simulation, with the latter followed by a written report on all aspects of the design. Every student will be a commentator on another student's paper. Exercises from the textbook should be worked on an individual basis and collected in a notebook. The student will participate in discussion sessions led weekly by a TA.

    For those interested, VLSI layout is possible with fabrication via MOSIS (actual fabrication will require a commitment to make measurements on the chip, for which the Microelectronics Design Laboratory annex, Rm AVW 1364, can be made available).

    Use of Spice (and/or PSpice or a similar circuit analysis program) is required. Copies of various evaluation versions of PSpice are available for student download (ftp of 8.0 disks from http://www.ee.umd.edu/newcomb/spice_dl.htm; [latest evaluation version OrCAD16.3 Demo may still be obtained from Cadence at http://www.cadence.com/products/orcad/pages/downloads.aspx.]; some are on the PCs of Room EGR 0123 and Berkeley Spice is on the UNIX workstations of the ECE Department Computer Laboratories (Rms AVW 1442, 1454). Every student should get an ECE account by the end of the first week of class.
13. Grading: Roughly:
    20% = homework and designs [collected in a dated indexed notebook]
    15% = class participation including commentator and discussion section activities
    20% = midterm exam
    25% = formal written individual design report [<11 pages, 1.5 spacing]
    20% = final [Tu 05/17/11 08:00-10:00]