ECE 433 LINEAR ELECTRONICS II SPRING 2012

Class Time and Location: 12279 – ECE 433 – 001  MW 9:00 a.m. – 10:15 a.m.  Room# Robinson A 208

Instructor: Alok K. Berry, Room No. 3238 in Nguyen Engineering Building  TA:  
Phone: (703)-993-1606  email: aberry@gmu.edu  
Office Hours: MTWR 11:00 a.m. – 12:00 p.m.  Others by appointment  
                  T      5:00 p.m. – 6:00 p.m.  By Appointment Only


Prereq.       Grade of C or better in ECE 333

Topics:       It is the second course in linear electronics covering the topics: differential amplifiers, feedback circuits, power amplifiers, frequency response, analog integrated circuits, operational amplifier systems, oscillators, wide band and microwave amplifiers, and computer-aided design.

Important Instructions/Information

a. Prior to the class, it is expected that one reads the material which is to be covered in the class.

b. Almost in every class a set of assigned homework problems will be collected, graded and then it will be returned. **Home works will be accepted in class only and after grading returned in class.** If you happen to miss a class when HW is returned, it is your responsibility to collect it promptly.

c. Some homework solutions may be provided. Solutions to exams will be discussed in class.

d. No overdue for homework and no make up for exams.  
   **In an extreme case if a makeup exam is given only 50% of the credit (what one earns in the makeup exam) may be counted in making the final grade. The makeup exam may be an oral exam and given in the finals week.**

e. GMU HONOR CODE will be strictly enforced. Violations of the honor code may result in receiving no credit for this course.  **Any work submitted by you, which is to be graded, must be of your own. If it is found that the work submitted by a student has been copied from solution manual or from some other source then the case may be forwarded to the Honor Committee.**

f. **Important Dates:**  
The last date to drop is Friday, February 24th.  
The Selective Withdrawal Period is from Monday, 2/27/12 to Friday, 3/30/12.

Grading:   Home Works and Class Participation 10%  
            Mini Exam in 3rd in week of classes 10%  
            Project/Presentation/Poster 10%  
            1st Class Exams 35%  
            Comprehensive Final Exam 35%  

**Comp Final Exam**  Monday, May 14th, 2012  
Time 7:30 a.m. – 10:15 a.m.

Comp. Exam will be of about 2 hour duration.
**Topics to be Covered**

1. Building Blocks of Integrated-Circuit Amplifier  
2. Differential and Multistage Stager Amplifiers  
3. Frequency Response  
4. Feedback  
5. Output Stages  
6. Operational Amplifiers etc.

Two Exams  

**Please follow the following guidelines for ECE 433 homework**

1. Use only the regular size paper (8.5" by 11")
2. All pages must be stapled.
3. Do the homework neatly and show all the steps clearly.
4. **Must draw** the required circuit or circuits for each problem? No grades for the entire home work if in any problem required circuits are not drawn.
5. Put the answers in block or underline them. You will lose 50% of the grades in any HW if you do not highlight the answer/answers.

The homework will not be accepted if these guidelines are not followed.

**IMPORTANT:** Please note it is the university policy that all sound emitting devices (cell phones, pagers etc.) shall be turned off during classes unless otherwise authorized by the instructor. It is required by me that all of these devices will be kept in the purse or in the back-pack. If you have an emergency please talk with me prior to the class.

**VERY IMPORTANT:** If you receive very low grades in one or more class exams then you may receive a grade of AD@ or AF@ in the course.  
**Extremely Important:** Your final grade is assigned based upon what you have earned during the semester. This is a demanding course and make sure that you spend enough time to understand the material and demonstrate it in exams and during class discussions.

The homework will be accepted only during the class. Graded homework will be returned in the class. The graded work of the students not present in the class will be placed in a box in my office. If you are not present in the class, it is your responsibility to collect it.

You are allowed to discuss the home works and projects with your classmates but copying any material to be submitted for grading will be considered a violation of the honor code.

**In exams you are not allowed to bring any formula sheet, if necessary I will provide the formulas.**

**Tentative Class Schedule**
<table>
<thead>
<tr>
<th>Dates</th>
<th>Subject</th>
<th>Lecture Reference</th>
<th>Independent Reading</th>
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</thead>
<tbody>
<tr>
<td>1/23, 1/25</td>
<td>Introduction, Building Blocks IC Amp. Cascode Amplifier, Comp. of MOS and BJT Transistor Pairings</td>
<td>7.1 – 7.3</td>
<td>Review 5.5 – 5.8, 6.5 – 6.8, Intro. Ch. 7, Appendix 7A</td>
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<tr>
<td>1/30, 2/1</td>
<td>Current Sources/Mirror Circuits, Transistor Pairings</td>
<td>7.4 – 7.6</td>
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<tr>
<td>2/6</td>
<td><strong>Mini Exam (25 minutes duration)</strong></td>
<td><strong>5.5 - 5.8, 6.5 - 6.8, 7.1 - 7.6</strong></td>
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<tr>
<td>2/6, 2/8</td>
<td>MOS /BJT Differential Pair Small Signal Operation</td>
<td>8.1 – 8.3</td>
<td>Introduction Ch. 8</td>
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<tr>
<td>2/13, 2/15</td>
<td>Non Ideal Characteristics Active Loaded Diff. Amplifiers Multistage amplifier</td>
<td>8.4 – 8.6</td>
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<tr>
<td>2/20, 2/22</td>
<td>Low and High Freq. Response of CS and CE Amplifiers</td>
<td>9.1 – 9.3</td>
<td>Introduction Ch. 9</td>
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<tr>
<td>2/27, 2/29</td>
<td>Imp. Tools to Analyze H. F. Response</td>
<td>9.4</td>
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<td>3/7</td>
<td><strong>1st Class exam</strong></td>
<td><strong>5.5 - 5.8, 6.5 - 6.8, and Chapter 7, 8, 9.1 - 9.3</strong></td>
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<td>3/5, 3/19</td>
<td>Frequency Response CS, CE, CG and Cascode Amplifiers etc.</td>
<td>9.5 – 9.7</td>
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<td>3/21, 3/26</td>
<td>Diff. and Multistage Amp Freq. Response</td>
<td>9.8, 9.10</td>
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<tr>
<td>3/28, 4/2</td>
<td>Feedback Structure and Properties of Negative Feedback, Feedback Topologies</td>
<td>10.1 – 10.3</td>
<td>Introduction Ch. 10, Read Sec. 1.5, 1.6</td>
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<tr>
<td>4/4, 4/9</td>
<td>Series-Shunt, Series-Series Shunt-Shunt and Shunt-Series Topologies etc.</td>
<td>10.4 – 10.8</td>
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<tr>
<td>4/11, 4/16</td>
<td>More about Feedback Output Stages</td>
<td>10.9 – 10.12</td>
<td>Section 10.11</td>
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<td>11.1 – 11.2</td>
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<td>4/18, 4/23</td>
<td>Output Stages Operational Amplifiers</td>
<td>11.3 – 11.5</td>
<td>Introduction Ch. 11</td>
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<td>12.1 – 12.3</td>
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<tr>
<td>4/25, 4/30</td>
<td>Operational Amplifiers</td>
<td>12.3 – 12.4</td>
<td>Introduction Ch. 12</td>
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<td>5/3</td>
<td>DC and Small Signal Analysis of the 741</td>
<td>12.5 – 12.6</td>
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<td>5/14</td>
<td><strong>Comp Final Exam</strong></td>
<td><strong>Chapters 7 – 12 (More will be discussed in class)</strong></td>
<td>Comp. Exam will be of about 2 hour duration.</td>
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**GOOD LUCK AND ENJOY THE COURSE/PROJECT**
SOME IMPORTANT INFORMATION

ACADEMIC INTEGRITY

GMU is an Honor Code university; please see the University Catalog for a full description of the code and the honor committee process. The principle of academic integrity is taken very seriously and violations are treated gravely. What does academic integrity mean in this course? Essentially this: when you are responsible for a task, you will perform that task. When you rely on someone else’s work in an aspect of the performance of that task, you will give full credit in the proper, accepted form. Another aspect of academic integrity is the free play of ideas. Vigorous discussion and debate are encouraged in this course, with the firm expectation that all aspects of the class will be conducted with civility and respect for differing ideas, perspectives, and traditions. When in doubt (of any kind) please ask for guidance and clarification.

GMU EMAIL ACCOUNTS
Students must use their Mason email accounts - either the existing “MEMO” system or a new “MASTERNET” account to receive important university information, including messages related to the class. See http://masonlive.gmu.edu for more information

OFFICE OF DISABILITY SERVICES
If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Services (ODS) at 993-2474. All academic accommodations must be arranged through the ODS. http://ods.gmu.edu

OTHER USEFUL CAMPUS RESOURCES:
WRITING CENTER: A114 Robinson Hall; (703) 993-1200; http://writingcenter.gmu.edu
UNIVERSITY LIBRARIES “Ask a Librarian”
http://library.gmu.edu/mudge/IM/IMRef.html

COUNSELING AND PSYCHOLOGICAL SERVICES (CAPS): (703) 993-2380; http://caps.gmu.edu

UNIVERSITY POLICIES
The University Catalog, http://catalog.gmu.edu, is the central resource for university policies affecting student, faculty, and staff conduct in university academic affairs. Other policies are available at http://universitypolicy.gmu.edu/.

In case of emergency the important number to call is (703)-993-2810