Introduction
This version of the three credit course ECE3210, on-line, has been tailored to fit the Clemson Summer II schedule. There will be about 32 on-line modules/presentations, 4 homework assignments, 2 non-proctored on-line tests and a proctored final examination. This will be held at Clemson for Clemson students on Friday August 4 at 3:30 pm to 5:30 pm. Non-Clemson students will require a proctor to supervise their examination which will take place at an agreed time during the same day. The software package used for the course material presentation, testing, grade reporting etc. is “Canvas.” All course material will be found under “Modules” or “Quizzes” in Canvas. This may be added to as the session progresses.

Instructor: Michael A. Bridgwood

Office hours
Phone: During office hours I will be available on the phone (number to be determined.) I may be “on-the-road” during part of the session but will be at a computer during the office hour periods. You may not get me on the phone but I have found we can usually converse using E mail. Office hours will be held Monday through Thursday 9:30 am – 10:30 and 12:30 pm – 1:30 pm.

E mail address
mabibm@clemson.edu

Course Textbook
This text provides a solid basis for the course but the sequence of material presented may not follow the textbook exactly either in treatment or symbolism. It is recommended that the text be used as a reference resource and indeed there are several texts currently available on the market which would be appropriate for the course. The student is encouraged to look in other books and also to research any internet resources appropriate to the syllabus which might solidify understanding. The material of the course is generic to the discipline of Electrical Engineering and is not in any sense “owned by” the author of the currently recommended text.

Recommended Resources/Tools
Student edition of MathCad - any version (from PTC.com)
B2 Spice Lite version from Beige Bag Software (Downloadable free –recommend edition 4 but edition 5 is also ok)
Class Goals
- Learn how to apply mathematics to the analysis and design of electronic systems.
- Application of the design process and the use of basic principles of circuit theory to multi-component systems containing active and passive devices.
- Develop fluency in the use of simulation tools through exercises using SPICE in electronic system analysis to support analysis
- Gain experience in the use of software such Matlab, MathCad, Maple etc to aid in understanding the behavior of electronic systems

Prerequisites by Topic
- Fundamentals of DC and AC circuits
- Frequency response analysis
- Principles of solid-state devices
- Intermediate frequency amplifier models and transistor amplifier DC behavior

Topics                                      Approx. hours/ topic
1. Operational amplifier basics and applications   7.0 hours
2. Non-ideal operational amplifiers            3.0 hours
3. Frequency effects on operational amplifiers    3.0 hours
4. Review of biasing and intermediate frequency amplifiers  3.0 hours
5. Low, high and mid-frequency design of BJT/FET amplifiers  6.0 hours
6. Feedback and stability                      6.0 hours
7. Oscillator circuits                         3.0 hours
8. Power amplification                         3.0 hours
9. Analysis and design of differential and multi-stage amplifiers  3.0 hours
10. Integrated circuits and applications        3.0 hours
11. Tests                                      5.0 hours

Total Hours                                      45 hours

Text book section by section coverage relevant to the course will be available in Canvas in the Modules folder. Essentially the following chapters or sections will be covered in the order given below. Please note however that the presentation modules which you should focus on are not directly copied from this text, but are derived from many sources

Chapter 9                             Introduction to the operational amplifier
Chapters 10/11/14                      Integrated circuits – parts of these chapters
Chapters 7/15                           Frequency response
Chapter 12                             Aspects of Feedback – amplifier analysis and design
Chapter 15                             Oscillator circuits
Chapter 8                              Power amplifiers
**Homework**

Homework will be assigned on a weekly basis and will form 20% of the course grade. The homework assignment for the week will be made available on Canvas each Monday at 9 am with a “final turn in” time as indicated in the Summer ECE3210 2017 General Schedule (Canvas/Modules). I may be exploring the various options in Canvas, so the homework assignments may not be all in the same style. However it is most likely that they will be in a “multiple attempts” format (not multiple choice). This means you can do the assignment over as many times as you wish within the Canvas time window in order to “get it right.” The score that you have at the close of the “window” is what will be logged by the Canvas Grade center.” These homework assignments form the crucial core of the course and I know from my own experience that what you get out of the course will depend primarily on how you tackle the homework assignments. You will need to think hard and from time to time struggle with a problem to understand it and get it right. If you have problems with the homework and wish to send me your working I will only check it through if your analysis is written in understandable symbolic notation (non-numerical). I will not work through any homework scripts to check for mistakes if they are written in “numbers only” format. In other words I will not check your arithmetic nor try to ascertain if you have pressed the wrong buttons on your calculator. Numerical answers for the homework will be posted in Canvas after the homework due date.

**Teaching Method**

The course will be divided into 32 presentation lecture modules (currently) which will be uploaded and made available in Canvas according to the ECE3210 Summer 2017 General Schedule. The modules have been written using MathCad as a “flexible” word processor. While MathCad is very readable – you may not realize you are looking at what is primarily a numerical program at work – occasionally some of the terminology may be unfamiliar at first. All the analysis and problem-solving I work through in the modules will be in symbolic form. MathCad allows me to slip in numerical values, iterate, make decisions, produce graphical results, insert drawings, photographs and Spice simulations if need be. The modules will be uploaded to Canvas in two forms. A “hard copy” in .pdf format will be uploaded to “Presentation modules – hard copy” and a video copy in “Presentation modules – video.” The videos may be viewed by clicking directly on the HTML video file of interest. This will start the video.
Grading Policy
The grade will be based upon the results of 2 non-proctored on-line tests, 4 homework’s and a comprehensive proctored final examination. The dates for the homework’s, tests and final examination are given in Canvas/Modules/General Schedule
The overall class grade will be allocated on the following basis:-

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>4 homework’s</td>
<td>20% (5% each)</td>
</tr>
<tr>
<td>Test 1 (on-line)</td>
<td>20%</td>
</tr>
<tr>
<td>Test 2 (on-line)</td>
<td>20%</td>
</tr>
<tr>
<td>Final examination</td>
<td>40%</td>
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A grade of > 90% will guarantee an "A" grade and a grade of < 40% will likely constitute an "F" grade.

Contact
It is my intention to be as accessible to you as possible via E mail. The best means of communication for me is E mail. As indicated, office hours will be held on four days during the week and I or a teaching assistant will be available by phone or immediate E mail contact during these hours. Out of office hours I will mostly be able to get straight back to you with an e mail response if you choose this method of communication. Occasionally out-of-office hours I may not have immediate access to the internet. In any case I will try to maintain contact and aim to be back with you within 24 hours.

I will not be available most weekends and particularly Saturday and Sunday evenings, so be aware of this when you schedule your study times and particularly with respect to last minute problems you find while working on homework. Homework is likely to be due on Monday mornings by 9:00 am.

Key academic dates for the term are as follows:

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>Monday June 26</td>
<td>Orientation</td>
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<tr>
<td>Tuesday June 27</td>
<td>Late enrollment</td>
</tr>
<tr>
<td>Wednesday June 28</td>
<td>Classes begin</td>
</tr>
<tr>
<td>Thursday June 29</td>
<td>Last day to add a class</td>
</tr>
<tr>
<td>Thursday August 3</td>
<td>Study day</td>
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<tr>
<td>FRIDAY August 4</td>
<td>FINAL EXAMINATION</td>
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