TEXAS TECH UNIVERSITY
DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

ECE-3302: Fundamentals of Electrical Engineering – Summer I 2017  Section 001
M/T/W/TR/F from 08:00-09:50 A.M. (room ECE- 217)

CONTACT INFORMATION

<table>
<thead>
<tr>
<th>Instructor: Dr. Ayrton Bernussi</th>
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<tr>
<td>E-mail: <a href="mailto:ayrton.bernussi@ttu.edu">ayrton.bernussi@ttu.edu</a></td>
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<td>Phone: 806-834-8583</td>
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<tr>
<td>Office: Room ECE 239</td>
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<td>Office Hours:</td>
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<tr>
<td>M/T/W/TR/F: 10:00 AM – 11:00 AM  (or by appointment, and open door)</td>
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COURSE TEXTBOOK


COURSE OBJECTIVES

ECE-3302 prepares the students to perform basic electric circuit analysis. This includes DC, transient and sinusoidal steady-state analysis, and power and energy storage.

COURSE OUTCOMES

By the end of the course students should be able to:

- Apply the concepts of charge, current, voltage, power and energy to solve simple electric circuits
- Analyze electric circuits using Ohm's law and the concepts of mesh, nodes, and branches
- Apply Kirchhoff's current and voltage laws and perform analysis of circuits containing resistors arranged in series or in parallel
- Apply Thevenin’s and Norton's theorem to electric circuits
- Analyze electric circuits containing operational amplifiers
- Analyze electric circuits with capacitors, resistors and inductors arranged in series or in parallel
- Analyze the time-response of first-order (RC and RL) circuits.
- Apply the concepts of sinusoids and phasors to circuit elements
- Apply the concepts of impedance and admittance, and combinations, to electric circuits
- Perform sinusoidal steady-state analysis using previously learned circuit techniques
- Apply nodal and mesh analysis and Thevenin’s and Norton’s theorems in the frequency domain
- Perform instantaneous and average power calculation in a circuit
## Course Tentative Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
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| 06/06  | • Course & Syllabus discussion.  
        |   • Charge, Current, Voltage, and Power  
        |   • Circuit Elements  
        |   • Ohm’s Law  |
| 06/07  | • Nodes, Branches, and Loops  
        |   • Kirchhoff’s Laws  
        |   • Series Resistors & Voltage Division  |
| 06/08  | • Parallel Resistors & Current Division  |
| 06/09  | • Nodal Analysis & Mesh Analysis  |
| 06/12  | • Nodal Analysis & Mesh Analysis (cont.)  |
| 06/13  | • Superposition principle & Source Transformation  |
| 06/14  | • Thevenin’s & Norton’s Theorem  |
| 06/15  | • Operational Amplifiers  |
| 06/16  | EXAM #1  |
| 06/19  | • Exam #1 Solution  
        |   • Capacitors: Series & Parallel  
        |   • Inductors: Series & Parallel  |
| 06/20  | • RC & RL Transient Circuits  |
| 06/21  | • Singularity Functions  
        |   • Step Response of an RC and an RL Circuit  |
| 06/22  | • Step Response of an RC and an RL Circuit (cont.)  |
| 06/23  | • AC circuits: sinusoids and phasors  |
| 06/26  | • AC circuits: sinusoids and phasors (cont.)  |
| 06/27  | • Phasors and Circuit Elements  
        |   • Impedance and Admittance  
        |   • Kirchhoff’s Laws in the Frequency Domain  
        |   • Impedance Combinations  |
| 06/28  | • Sinusoidal Steady-State Analysis  
        |   • Nodal & Mesh Analysis  |
| 06/29  | • Superposition Theorem & Source Transformation  |
| 06/30  | EXAM #2  |
| 07/03  | • Exam #2 Solution  
        |   • Thevenin’s and Norton’s theorems in the frequency domain  |
| 07/04  | • AC Power Analysis  |
| 07/05  | • Instantaneous and Average Power  
        |   • Maximum Average Power Transfer  
        |   • Effective or RMS Value  |
| 07/06  | Review  |
| 07/07  | FINAL EXAM  |
NOTE: Topics and/or dates may be changed during the semester at the instructor’s discretion because of scheduling issues, developments in the discipline, or other contingencies.

ASSESSMENT, POLICIES AND PROCEDURES

Assessment:

EXAMS:

In this course there will be three (03) Exams (110 minutes duration for Exams #1 and #2, and 150 minutes duration for the Final Exam). The material for Exam #1 will be announced in class. Exam #2 and Final Exam will be comprehensive. All Exams are closed books, closed notes, and held in class.

ASSESSMENT DETAILS

Homework assignments:

Homework will be assigned in class (expect one homework/each textbook chapter). Due dates will be announced in class (and via Blackboard™).

Late Homework Policy:

Late assignments will receive a MAXIMUM grade of 70. Late solutions will be accepted up to 8:00 AM of the NEXT day of the due date. After that the grade will be recorded as ZERO.

NOTE: NO late homework will be accepted if the answers have been already posted on Blackboard™.

Exam dates and course grading policies:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Homework (average)</td>
<td>7%</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Exams</th>
<th>Date</th>
<th>Day of the week</th>
<th>Time</th>
<th>Room</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam #1</td>
<td>06-16-2017</td>
<td>Friday</td>
<td>8:00 a.m. to 9:50 a.m.</td>
<td>ECE-217</td>
<td>31%</td>
</tr>
<tr>
<td>Exam #2</td>
<td>06-30-2017</td>
<td>Friday</td>
<td>8:00 a.m. to 9:50 a.m.</td>
<td>ECE-217</td>
<td>31%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>07-07-2017</td>
<td>Friday</td>
<td>8:00 a.m. to 10:30 a.m.</td>
<td>ECE-217</td>
<td>31%</td>
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The following serves as an approximate grade distribution guide:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Range</th>
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<tr>
<td>A</td>
<td>≥90</td>
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<tr>
<td>B</td>
<td>80 - 89</td>
</tr>
<tr>
<td>C</td>
<td>70 - 79</td>
</tr>
<tr>
<td>D</td>
<td>60 - 69</td>
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<tr>
<td>F</td>
<td>&lt; 60</td>
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MISSED EXAM POLICY

MAKE-UP Exams are NOT scheduled for this course. However, if a student missed an exam due to an unforeseen extraordinary circumstance or with prior instructor approval, a make-up exam will be scheduled for the student. On both cases, the student MUST PRESENT a legitimate written DOCUMENTATION.
BLACKBOARD™ COURSE WEBSITE

Homework assignments and due dates, exam dates, and other course related information will be posted on Blackboard™. You will be responsible to check daily on the Blackboard™ course website for class announcements.

ATTENDANCE

Attendance will not be taken. However, you will be responsible for all material covered in class. It is your responsibility to make sure that you are present for all Exams, that all assignments are turned in on time, and that you are aware of all announcements made in class.

MESSAGING, FILMING, TAKING PICTURES OR RECORDING DURING CLASS

Receiving and sending cellular calls and checking/sending e-mail or texting are strictly prohibited during class. The use of any recording devices, filming or taking pictures is not permitted in class.

ACADEMIC INTEGRITY

Exams and homework assignments are strictly individual. All assignments and exams are expected to be your own. THEREFORE, it is imperative if you need help on your assignments that you contact your instructor.

CIVILITY IN THE CLASSROOM

Students are expected to assist in maintaining a classroom environment that is conducive to learning. Inappropriate behavior in the classroom that leads to the distraction of others shall not be tolerated under any circumstances.

RELATIONSHIP OF COURSE TO PROGRAM OUTCOMES

This course addresses EE Program Outcomes a, e and k.

ADA COMPLIANCE STATEMENT

Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor’s office hours. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services office in 335 West Hall or 806-742-2405.