COURSE SYLLABUS
EE 340: Introduction to Electrical Power Engineering
Spring 2016

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Other Recommended Books:

Pre- and Co-requisites:
Prerequisites: EE 221

Course Objectives:
- Calculate various powers and correct the power factor in 1-phase and 3-phase power circuits,
- Derive the efficiency, voltage regulation, electrical parameters, and loading on power transformers,
- Synchronous generator electrical characteristics including synchronization and control of power,
- The electromechanical characteristics of 3-phase induction motors.
- Types of power lines and how to determine their electrical parameters, and voltage regulation and efficiency under load, and loading limits
- Learn basic techniques for power flow studies
- Calculate symmetrical fault currents.
- Solve basic economic dispatching of electrical generators
- Utilize software to conduct power flow and fault calculations in complex power systems.

**Course Outcomes:**
Students should be able to
- Calculate real, reactive and apparent power, and power factor of given electrical loads, and determine appropriate capacitor size for desired power factor correction,
- Analyze three-phase circuits, and derive balancing and compensator elements for unbalanced loads.
- Determine the circuit parameters of power transformers, calculate their efficiency and voltage drop under various loads.
- Determine the circuit parameters of transmission lines, and means of controlling real and reactive power flow as well as line compensation and limitations.
- Determine the equivalent circuit parameters of synchronous machines, synchronize these machines to a power system, and control the active and reactive power generation.
- Have an understanding of the workings of three-phase induction motors in terms of equivalent circuit parameters and torque-speed curves.
- Derive the Y-bus matrix and power flow equations of a given network and perform such a study using a software package.
- Derive the short-circuit equations of a given network and perform such a study using a software package.
- Solve basic economic dispatch problems.

**Computer Usage:**
PSpice, PowerWorld

**Tests:**

<table>
<thead>
<tr>
<th>Test</th>
<th>Description</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm</td>
<td>Covers first half of course material</td>
<td>30 Pts</td>
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<tr>
<td>Homework Assignments</td>
<td>Require use of computer simulation tools (Spice, PowerWord)</td>
<td>20 Pts</td>
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<tr>
<td>Quizzes</td>
<td>Nearly every 10 days</td>
<td>30 Pts</td>
</tr>
<tr>
<td>Final</td>
<td>Covers all course material</td>
<td>40 Pts</td>
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<tr>
<td><strong>Total</strong></td>
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<td><strong>120 Points</strong></td>
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**Grading:**
A ≥ 100 > B ≥ 80 > C ≥ 70 > D ≥ 50 > F

**Notes:**
- Some homework problems will be assigned but not collected. Everyone is highly encouraged to do the assigned homework problems as some of the test problems will be similar to these.
- There will be no make-up tests or quizzes.
There will be no extra credit work for individuals.

Class attendance and participation is highly encouraged.

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**Religious Holidays Policy** – Any student missing class quizzes, examinations, or any other class or lab work because of observance of religious holidays shall be given an opportunity during that semester to make up missed work. The make-up will apply to the religious holiday absence only. It shall be the responsibility of the student to notify the instructor no later than the first two weeks of classes of his or her intention to participate in religious holidays which do not fall on state holidays or periods of class recess. This policy shall not apply in the event that administering the test or examination at an alternate time would impose an undue hardship on the instructor or the university which could have been avoided. For additional information, please visit: [http://catalog.unlv.edu/content.php?catoid=4&navoid=164](http://catalog.unlv.edu/content.php?catoid=4&navoid=164).

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