San José State University  
College of Engineering  
EE134-01, Power Systems, Fall, 2019

Course and Contact Information

Instructor: Ahmad Shahsiah
Office Location: Engineering Building Room 347A
Telephone: (408) 924-3950
Email: ahmad.shahsiah@sjsu.edu
Office Hours: Friday 18:15~19:15, ENG 347A
Class Days/Time: Friday 15:30~18:15
Classroom: ENG 341
Prerequisites: EE 110 and EE 112 (with grade of "C" or better).
GE/SJSU Studies Category: Undergraduate

Course Format

Course Description (Required)

Introduction to power systems including: complex power, power factor correction, power quality, power flow analysis, grid steady state and transient stability, fault analysis, integration of renewable energy, theory and modeling of transformers, transmission lines, and synchronous generators.

Course Learning Outcomes (CLO)

Upon successful completion of this course, students will be able to:

1. Determine voltage, current, power, reactive power of a three-phase circuit
2. Use per-unit system to model a power system.
3. Calculate transmission line parameter based on simplified model.
4. Determine necessary condition for maintaining voltage level.
5. Formulate power flow problem for solution by numerical methods.

Required Texts/Readings (Required)

Textbook

Other Readings


Course Requirements and Assignments

Homework is crucial for understanding the course material. Homework will be assigned regularly and will be collected and graded. Students are encouraged to discuss homework problems with other students in the class but you have to submit your own independent solutions. Copied homework earns zero grade for all parties involved and could have more serious consequences.

Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally 3 hours per unit per week with 1 of the hours used for lecture) for instruction or preparation/studying or course related activities including but not limited to internships, labs, clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus.

Final Examination or Evaluation

There will be one midterm and one final exam. The midterm dates will be announced at least 1 week before the exam. The final exam will be given at the official university final exam time for this course. All exams are closed book. One 8.5” by 11” (front & back) summary sheet in your own hand-writing is allowed.

Grading Information and Determination

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Homework</td>
<td>25%</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>35%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>40%</td>
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</tbody>
</table>

A from 100 to 94    A minus from 93 to 90
B plus from 89 to 87 B from 86 to 84    B minus from 83 to 80
C plus from 79 to 77 C from 76 to 74    C minus from 73 to 70
D plus from 69 to 67 D from 66 to 64    D minus from 63 to 60    F below 60

This course must be passed with a C minus or better as a CSU graduation requirement.

University Policies:

Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester’s Catalog Policies section at http://info.sjsu.edu/static/catalog/policies.html. Add/drop deadlines can be found on the current academic year calendars document on the Academic Calendars webpage at http://www.sjsu.edu/provost/services/academic_calendars/. The Late Drop Policy is available at http://www.sjsu.edu/aars/policies/latedrops/policy/. Students should be aware of the current deadlines and penalties for dropping classes.

Information about the latest changes and news is available at the Advising Hub at http://www.sjsu.edu/advising/.
Consent for Recording of Class and Public Sharing of Instructor Material

University Policy S12-7, http://www.sjsu.edu/senate/docs/S12-7.pdf, requires students to obtain the instructor’s permission to record the course and the following items to be included in the syllabus:

- “Common courtesy and professional behavior dictate that you notify someone when you are recording him/her. You must obtain the instructor’s permission to make audio or video recordings in this class. Such permission allows the recordings to be used for your private, study purposes only. The recordings are the intellectual property of the instructor; you have not been given any rights to reproduce or distribute the material.”
- “Course material developed by the instructor is the intellectual property of the instructor and cannot be shared publicly without his/her approval. You may not publicly share or upload instructor generated material for this course such as exam questions, lecture notes, or homework solutions without instructor consent.”

Academic integrity

Your commitment, as a student, to learning is evidenced by your enrollment at San Jose State University. The University Academic Integrity Policy S07-2 at http://www.sjsu.edu/senate/docs/S07-2.pdf requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The Student Conduct and Ethical Development website is available at http://www.sjsu.edu/studentconduct/.

Campus Policy in Compliance with the American Disabilities Act

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 at http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf requires that students with disabilities requesting accommodations must register with the Accessible Education Center (AEC) at http://www.sjsu.edu/aec to establish a record of their disability.

Accommodation to Students’ Religious Holidays

San José State University shall provide accommodation on any graded class work or activities for students wishing to observe religious holidays when such observances require students to be absent from class. It is the responsibility of the student to inform the instructor, in writing, about such holidays before the add deadline at the start of each semester. If such holidays occur before the add deadline, the student must notify the instructor, in writing, at least three days before the date that he/she will be absent. It is the responsibility of the instructor to make every reasonable effort to honor the student request without penalty, and of the student to make up the work missed. See University Policy S14-7 at http://www.sjsu.edu/senate/docs/S14-7.pdf.
## EE134 / Power Systems, Fall 2019, Tentative Course Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topics, Readings, Assignments, Deadlines</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>8/23/19</td>
<td>Course introduction, phasor analysis, active and reactive powers, reactive power compensation, balanced three-phase systems.</td>
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<tr>
<td>2</td>
<td>8/30/19</td>
<td>Transformers, magnetic circuits, transformer circuit model, transformer tests, voltage regulation and efficiency, transformer magnetization and inrush.</td>
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<tr>
<td>3</td>
<td>9/6/19</td>
<td>Three-phase transformers, one-line diagrams, per-unit calculations.</td>
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<tr>
<td>4</td>
<td>9/13/19</td>
<td>Magnetic flux and inductance, inductance of transmission lines, transmission line conductors, bundled conductors.</td>
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<tr>
<td>5</td>
<td>9/20/19</td>
<td>Electric fields, Capacitance of transmission lines, Capacitance of three-phase lines, effect of earth.</td>
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<tr>
<td>6</td>
<td>9/27/19</td>
<td>Transmission line modeling, short and medium transmission lines, Introduction to long transmission lines and traveling waves.</td>
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<tr>
<td>7</td>
<td>10/4/19</td>
<td>Midterm Exam</td>
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<tr>
<td>8</td>
<td>10/11/19</td>
<td>Power flow and reactive power in transmission lines, introduction to transmission line transients and reflection, introduction to lattice diagrams.</td>
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<tr>
<td>9</td>
<td>10/18/19</td>
<td>System study and load flow, Gauss-Seidel and Newton-Raphson methods.</td>
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<tr>
<td>10</td>
<td>10/25/19</td>
<td>Symmetrical faults, fault current calculations, system protection.</td>
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<tr>
<td>11</td>
<td>11/1/19</td>
<td>Symmetrical components, short circuit current calculation for unbalanced 3-phase faults, sequence networks.</td>
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<tr>
<td>12</td>
<td>11/8/19</td>
<td>Electric machinery fundamentals, synchronous generators.</td>
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<tr>
<td>13</td>
<td>11/15/19</td>
<td>Generator stability, swing equation, equal area criterion.</td>
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<tr>
<td>14</td>
<td>11/22/19</td>
<td>System control, economic dispatch, Distribution systems, grounding, harmonics.</td>
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<tr>
<td>15</td>
<td>11/29/19</td>
<td>Scheduled Holiday - Thanksgiving</td>
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<tr>
<td>16</td>
<td>12/6/19</td>
<td>Review Session / Q&amp;A</td>
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<tr>
<td>Final Exam</td>
<td>12/13/19 1445-1700</td>
<td>To be announced</td>
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