Syllabus for
**EE 361—Power Systems Analysis**
Fall 2009

I. COURSE DESCRIPTION

The study of symmetrical components, per-unit representation, transmission line analysis, power transformer analysis, synchronous machine analysis, and introductory computer power flow analysis.
Prerequisites: EGR 210 and EE 311.
Course Fee: $35.

II. COURSE GOALS

This course will enable students to study and solve fundamental problems in power systems analysis. A design project will synthesize the course material.

III. STUDENT LEARNING OUTCOMES FOR THIS COURSE

The student who successfully completes the course will be able to do the following:

A. Orally or writing, give a brief history of the electrical power industry.

B. Construct power system representation.

C. Construct transmission line analysis and its equivalent circuit.

D. Construct methods using the computer for power flow analysis.

E. Synthesize the above concepts in a design project.

IV. TEXTBOOKS
Required Materials
Textbook
Power Systems Analysis 2nd Edition, Arthur R. Bergen and Vijay Vittal, Prentice Hall, 2000.

V. POLICIES AND PROCEDURES

A. University Policies and Procedures
1. Attendance at each class or laboratory is mandatory at Oral Roberts University. Excessive absences can reduce a student's grade or deny credit for the course.
2. Students taking a late exam because of an unauthorized absence are charged a late exam fee.
3. Students and faculty at Oral Roberts University must adhere to all laws addressing the ethical use of others' materials, whether it is in the form of print, video, multimedia, or computer software. By submitting an assignment in any form, the student gives permission for the assignment to be checked for plagiarism, either by submitting the work for electronic verification or by other means.
4. Final exams cannot be given before their scheduled times. Students need to check the final exam schedule before planning return flights or other events at the end of the semester.

5. Students are to be in compliance with University, school, and departmental policies regarding Whole Person Assessment requirements. Students should consult the WPA handbooks for requirements regarding general education and the students' majors.
   a. The penalty for not submitting electronically or for incorrectly submitting an eportfolio artifact is a zero for that assignment.
   b. By submitting an assignment, the student gives permission for the assignment to be assessed electronically.

B. Course Policies:

1. Evaluation Procedures:

| | |
|---|---|
| Homework | 10% |
| Project | 20% |
| Exam 1 | 20% |
| Exam 2 | 20% |
| Final Exam | 30% |
| Total | 100% |

7. Whole Person Assessment Requirements:
   None.
2. Examination:
   There are three 100-point exams. Exams cannot be given before their scheduled time. Students who can not make it for an exam as required must have an authorized excuse or a convincing reason, and must inform the instructor in time. Otherwise, no late exam will be considered.
3. Attendance:
   Attendance at classes is mandatory and the students are expected to be punctual. It will incur one absence for every two times they are late. Three absences are allowed to accommodate emergencies and illnesses. Each absence thereafter will result in a 1% grade deduction in the final score (10% maximum). The final score will be increased by 1% as a reward for full attendance.
4. Handouts, etc
   Lecture handouts, if any, will be distributed at the beginning of a lecture. If a student misses a class, the relative information must be obtained from his/her classmates.
5. Homework:
   Homework, if any, will be assigned at the end of each lecture and will be due at the beginning of the following lecture. Late submission will result in a lower grade.
6. Academic Honesty:
   The students are strongly encouraged to work out the solutions of their homework on their own. Discussions are encouraged. Copying homework solutions from solution manual and other classmates is considered dishonest. Dishonesty in an exam, if detected, will immediately lead to a failing grade for the course and will be reported to the Dean of Arts and Sciences.

VI. COURSE CALENDAR

| Week | Chapter | Topic |
|---|---|---|
| 1 | | Course introduction |
| 2 | Chapter 1 | Introduction |
| | Chapter 2 | Basic principles |
| 3 | Chapter 2 | Basic principles |
| 4 | Chapter 3 | Transmission-line parameters |
| 5 | Chapter 3 | Transmission-line parameters |
| 6 | **Exam I** and discussion | |
| 7 | Chapter 4 | Transmission-line modeling |
| 8 | Chapter 4 | Transmission-line modeling |
| | Chapter 9 | Network Matrices |
| 9 | **Exam II** and discussion | |
| 10 | **Fall Break** | |
| 11 | Chapter 10 | Power flow analysis |
| 12 | Chapter 10 | Power flow analysis |
| 13 | Chapter 10 | Power flow analysis |
| 14 | Chapter 10 | Power flow analysis |
| | Mini-Project | |
| 15 | Mini-Project and discussion | |
| 16 | study week | |
| 17 | **Final exam** | |

**Course Inventory for ORU's Student Learning Outcomes**

**EE 361 Power Systems Analysis**
**Fall 2009**

This course contributes to the ORU student learning outcomes as indicated below:
***Significant Contribution*** – Addresses the outcome directly and includes targeted assessment.
***Moderate Contribution*** – Addresses the outcome directly or indirectly and includes some assessment.
***Minimal Contribution*** – Addresses the outcome indirectly and includes little or no assessment.
***No Contribution*** – Does not address the outcome.

The Student Learning Glossary at http://ir.oru.edu/doc/glossary.pdf defines each outcome and each of the proficiencies/capacities.

| | **OUTCOMES & Proficiencies/Capacities** | Significant Contribution | Moderate Contribution | Minimal Contribution | No Contribution |
|---|---|---|---|---|---|
| **1** | **Outcome #1 – Spiritually Alive** Proficiencies/Capacities | | | | |
| 1A | Biblical knowledge | | | | √ |
| 1B | Sensitivity to the Holy Spirit | | | | √ |
| 1C | Evangelistic capability | | | | √ |
| 1D | Ethical behavior | | | √ | |
| **2** | **Outcome #2 – Intellectually Alert** Proficiencies/Capacities | | | | |
| 2A | Critical thinking | √ | | | |
| 2B | Information literacy | | √ | | |
| 2C | Global & historical perspectives | | | √ | |
| 2D | Aesthetic appreciation | | | | √ |
| 2E | Intellectual creativity | | √ | | |
| **3** | **Outcome #3 – Physically Disciplined** Proficiencies/Capacities | | | | |
| 3A | Healthy lifestyle | | | | √ |
| 3B | Physically disciplined lifestyle | | | | √ |
| **4** | **Outcome #4 – Socially Adept** Proficiencies/Capacities | | | | |
| 4A | Communication skills | | | √ | |
| 4B | Interpersonal skills | | | | √ |
| 4C | Appreciation of cultural & linguistic differences | | | | √ |
| 4D | Responsible citizenship | | | √ | |
| 4E | Leadership capacity | | | √ | |