Course Assessment Report

Course Number: EE491

Course Title: Performance of Power Systems

Semester Offered: Fall 2005

Instructor Name: Mani V. Venkatasubramanian

I. List of Assessment Outcomes from the course syllabus.

   A. Ability to apply knowledge of mathematics, science and engineering.
   C. Ability to design a system, component, or process to meet desired needs.
   G. Ability to communicate effectively in written and oral formats.

II. List of Course Topics from the course syllabus.

   1) Review of power system components and analysis.
   3) State Estimation.
   4) Generator modeling.
   5) Generator controls and interarea exchange.
   6) Economic operation, hydrothermal coordination.
   8) Introduction to power system security

III. Course Assessment Summary Table: at least one row of the table should be devoted to each of the checked outcomes in part I.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Topics</th>
<th>Medium</th>
<th>Specific Measures</th>
<th>Weight in course</th>
<th>Instructor’s assessment/comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1-3, 5-8</td>
<td>Homeworks</td>
<td>Homeworks 1-9</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Projects</td>
<td>Projects 1-2</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exams</td>
<td>Midterm 1 and 2, Final Exam</td>
<td>80%</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>2,5,6</td>
<td>Homework</td>
<td>Homeworks 3-8</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Projects</td>
<td>Projects 1-2</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exams</td>
<td>Midterm 2 and Final Exam</td>
<td>55%</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>2,4,7</td>
<td>Projects</td>
<td>Projects 1-2</td>
<td>10%</td>
<td></td>
</tr>
</tbody>
</table>
IV. Qualitative Assessment of Student Performance: using the table above and other data support the claim that students who completed this course with a grade of C or better have achieved each of the intended outcomes of this course.

Outcome A: Ability to apply knowledge of mathematics, science and engineering:

All the homeworks in the EE491 course related to this outcome. The student average in the class was 7.23 out of 10 which showed that the students did well in most of the homework problems. The class averages in Midterm 1, Midterm 2 and Final examination were 74, 84 and 74 respectively out of 100 that again showed a good performance by the class in applying the concepts to the power engineering problems. The averages in Project 1 and Project 2 were 91 and 94 respectively, which was excellent. Therefore, we can interpret the class to have done well in learning Outcome A.

Outcome C: Ability to design a system, component, or process to meet desired needs:

The EE491 class includes the topics of power-flow analysis, economic dispatch and generation controls which all address Outcome C. These topics were covered in Homeworks 3 to 8. The student averages were consistently high in these homeworks as noted above. Similarly, the student average in Midterm 2 and the Final examination were 84 and 74 out of 100, which showed that the students learnt the outcome well. Again, the student averages in the projects were excellent.

Outcome G: Ability to communicate effectively in written and oral formats:

EE491 includes two projects which are both offered as Take-Home examinations. Both projects require the students to carry out power-flow analysis (Project 1) and stability analysis (Project 2) on test power systems, and the students need to prepare written reports. The student averages in the two projects were 91 and 94 respectively, which showed an excellent performance by the students.

OVERALL AVERAGE AND GRADES REPORTED

The overall average for the course was 78% for the 7 students enrolled in the course. The number of students at the different grade levels were as follows:

A (1), A-(1), B+(2), B(2), B-(1), C+(0), C(0), C-(0), D+(0), D(0), F(0)

FINAL OBSERVATION

Analysis of the grade distribution shows that many of the students did very well in the course. All the students received A and B grades. Two of the seven students received A or A- grades, while the rest received B+, B or B- grades. The students showed strong interest throughout the course as shown by the average of 94% in Project 2 and 74% in the comprehensive Final examination.