Washington State University
School of EECS
Electrical Engineering Course Assessment Report

Course Number   EE362
Course Title   Power System Laboratory
Semester Offered: Spring 2009
Instructor: Luis Pérez
10th Day Enrollment: 23
Number Completing Successfully (C grade or better): 21

I. Assessment Outcomes from the Course Syllabus

X (A) Ability to apply knowledge of mathematics, science and engineering.
X (B) Ability to design and conduct experiments as well as analyze and interpret data.
X (C) Ability to design a system, component, or process to meet desired needs.
□ (D) Ability to function on multidisciplinary teams.
□ (E) Ability to identify, formulate, and solve engineering problems.
□ (F) An understanding of professional and ethical responsibility.
X (G) Ability to communicate effectively in written and oral formats.
□ (H) A broad education necessary to understand the impact of engineering solutions in global, economic, and societal context.
□ (I) Recognize the need for, and have the ability to engage in life long learning.
□ (J) Have a broad education and knowledge of contemporary issues.
□ (K) Ability to use techniques, skills and modern engineering tools necessary for engineering practices.

II. List of Course Topics from the Course Syllabus

1. Introduction to laboratory facilities and simple single- and three-phase balanced loads
2. Introduction to LabVIEW
3. Nonlinear magnetic circuits, harmonics, inrush phenomena and single-phase transformers
4. Three phase transformer connections and harmonics
5. Rotating magnetic fields and induction machines
6. Simple controller design in LabVIEW
7. Synchronous machines
8. DC machines and DC supply characteristics
9. Final project – Induction generator control, simulation and implementation
III. Course Assessment Summary Table: one row of the table should be devoted to each of the checked outcomes in part I. (Feel free to delete unused rows.)

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Topics</th>
<th>Specific Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Ability to apply knowledge of mathematics, science and engineering.</td>
<td>1-9</td>
<td>Permanent personal assessment in the laboratory. Laboratory reports Final project report</td>
</tr>
<tr>
<td>(B) Ability to design and conduct experiments as well as analyze and interpret data.</td>
<td>1-9</td>
<td>Permanent personal assessment in the laboratory. Laboratory reports Final project report</td>
</tr>
<tr>
<td>(C) Ability to design a system, component, or process to meet desired needs.</td>
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</tbody>
</table>

IV. Using the table as a guide, for each outcome summarize your evaluation of the students’ achievement of that outcome; cite student performance on the identified measures as evidence to support your conclusions.

Relatively high grades (B as average) show that the students improved or learnt for the first time, the process of creating an experiment to study electrical circuits, electric machinery and electric systems in general.

Each laboratory experiment contains a large amount of data that the students have to properly interpret, analyze and mathematically treat so they can use it. Most of the students learned this process applied to electric power systems.

They improved their technical report writing skills because each laboratory experiment requires a formal report, and the class ends with a final project formal written report. The instructor could verify how their report writing skills evolved from very basic, informal reports written at the beginning, to reports that in some cases could be qualified as professional.

Finally, as they have to work in groups of three individuals, any team disorganization exhibited at the beginning of the semester was clearly overcome at the end, where harmonically assembled teams collaborated to reach the common goals.
V. Qualitative Assessment of Student Performance: using the arguments 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.

The student performance was good, as an average. It is important to emphasize that it was very evident from the reports and individual and oral individual and team assessment, that the students learned the material and acquired skills they did not have when they started the semester. A few students did not show much interest for this topic because they were planning to specialize in a different area. A very few of them remained with that attitude at the end of the semester.

VI. Concerns: state any concerns you may hold about this class – were the students adequately prepared coming into it? Are there topics or outcomes where (some) students were weak after completing the course? Other concerns? Were there any comments on students’ course evaluations that should be addressed in future instances of the course?

This section is very important for improving our program: it provides critical input to the curriculum committee for identifying areas requiring attention.

The following improvements were made this semester:

1. The laboratory sheets used by the students were improved, although still need more work

2. In order to overcome the problem of students having difficulty to match theory and practice, the instructor made 45 min of practical review before each laboratory exercise.

3. The deficiencies of the students in programming and MatLAB were addressed by the instructor during the first week of classes, providing an overview of the most used commands and procedures in this laboratory.

4. The deficiencies that some students present the theoretical and practical background of electrical circuits; for example, the connection of metering devices (series or parallel) was addressed by the instructor and TAs in each lab exercise in order make sure the students understand what they were doing.

5. The instructor met with the TAs at the beginning of the semester to assure that the students received more help during the lab exercises. This method succeeded and the response of the students was better than in the previous semester.

Some of these weaknesses were addressed during the semester; however, most of them will be improved even more in the following periods.

Signature __Luis Pérez____ Date: 05/20/2009