I. Assessment Outcomes from the Course Syllabus

☐ (A) Ability to apply knowledge of mathematics, science and engineering.
☐ (B) Ability to design and conduct experiments as well as analyze and interpret data.
☐ (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.
☐ (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

This course now includes 9 different experiments and one final “design project”. The experiments are designed to augment the material taught in EE 361 on electromechanical energy conversion, and introduce concepts of measurements and instrumentation, and simple control methods. Experiments are performed on single phase and three phase low a.c. voltage (120/208 V) power system devices: transformers, a.c. machines, loads, and low voltage (245 V) d.c. machines. Eight of the nine experiments are explained in details with complete procedures. One experiment is left open ended so that students must decide on proper procedures and appropriate measurements. The final design in Fall 2005 project was an automatic synchronizer for synchronous machine. This project was chosen with intention to develop necessary components for building a small autonomous power system in the future. The students work in groups of 3 or less to perform the following assignments:

1. Introduction: presentation of safety and equipment protection in lab procedures, introduction to lab facilities, three phase loads.
2. Introduction to the fundamentals of LabView.
4. Transformers: calculation of losses and impedances in positive sequence three phase connections.
5. General rotating machinery and induction machines: calculation of parameters and measurement of performance.
6. Synchronous machines and DC supplies modeling.
7. DC machines: machine parameters, investigation of series and shunt connections.
8. Controller design in LabView.
9. Simulation of dynamic systems.
10. Project design: machine control.

III. Course Assessment Summary Table: 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>Specific Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>(C) Ability to design a system, component, or process to meet desired needs.</td>
<td>1-10</td>
<td>Lab reports</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quizzes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Final project report</td>
</tr>
</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.

(C) Ability to design a system, component, or process to meet desired needs.

As usual, at the beginning, students needed more assistance from the instructor and/or the TAs. After the first two experiments, the students felt more comfortable in the lab and were able to perform the tasks with less help. By the end of the semester, most of the students were able to function independently in the lab. They showed understanding of the equipment and software and were confident to use them in the design project.

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 students showed very good understanding in designing the simple control system for the final project. They also showed good engineering judgment in solving the problems they faced in their approach. It seems that the students were able to take advantage of being in such a small number of only 5 and still having two instructors/TAs in the lab. Both groups of students completed the final project successfully and, at the end, they were pleased with the results accomplished.

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.

Signature __________________________________________ Date: ______________________

Please email a copy of the completed form to Patricia Arnold, patricia@eeecs.wsu.edu and deliver a signed hardcopy to her mailbox.