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

1. Definitions and units; resistors; Ohm’s Law; Kirchoff’s Laws; dependent sources; operational amplifiers.
2. Nodal analysis; mesh analysis; Thevenin and Norton equivalent circuits; maximum power transfer; superposition.
3. Capacitors and inductors; integro-differential circuit equations.
4. First order circuits; step functions; second order circuits.
5. Sinusoidal steady state analysis; single and three-phase circuits.
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>(A) Ability to apply knowledge of mathematics, science and engineering.</td>
<td>1 - 5</td>
<td>Examinations, homework assignments</td>
</tr>
<tr>
<td>(E) Ability to identify, formulate, and solve engineering problems.</td>
<td>1 - 5</td>
<td>Examinations, homework assignments</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.

(A) Ability to apply knowledge of mathematics, science and engineering.

Homework assignments and in-class examinations are used to assess this criterion. Assessment of student performance is primarily dependent upon examination scores; 85% of the students’ final grade is based on examination scores. Three midterm exams are given, worth a total of 60% of the students’ final grade. The midterm exams are designed to be very similar to homework assignments and in-class examples. The final exam is worth 25% of the students’ final grade. Final exam questions are designed to be somewhat more in-depth than midterm exam questions; final exam problems are designed to require some synthesis of various topics covered in the course.

(E) Ability to identify, formulate, and solve engineering problems.

Examination problems are designed to require students to meet ABET criterion E. Solution approaches are rarely specified in the problem statements; an appropriate solution approach must be identified in order to effectively solve the problem.

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 overall average score for the three midterm exams was approximately 77%, reflecting the similarity between the exam questions, homework problems, and examples performed in class. The average score on the final exam was significantly lower, at slightly under 70%. It is expected that the final exam scores are more representative of the overall knowledge level of the students upon leaving the class.
Students had to receive an overall score of 60% or better to complete the course with a grade of C or better. Only four out of the twenty six students completing the course failed to achieve this grade cutoff.

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.

Students are adequately prepared in most areas upon entry into the course. One exception is the area of complex arithmetic; many students seem unprepared to perform the complex arithmetic associated with phasor analysis late in the course. The discussion of resistive circuits could possibly be condensed in EE 261; students seem to have seen many of these topics in their introductory physics classes. The time saved with a less exhaustive discussion of resistive circuits could be spent on a more thorough complex arithmetic review.

Another concern is that many students are weak in first and second order circuits when they leave the course. This does not appear to be due to a shortcoming in their differential equations background; the problem seems to be more related to a disconnect between the mathematics and the physics of the circuits. Additional laboratory exercises or in-class demonstrations might help this shortcoming.

Some extended homework assignments, emphasizing circuit design, should be introduced into the course.

Signature ___________________________ Date: _______________________

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