Tennessee Technological University

Department of Electrical and Computer Engineering

Outcomes, Assessments and Actions

The Department of Electrical and Computer Engineering offers two undergraduate degree programs (BSEE, BSCmpE) and one graduate program (MSECE). This document presents the program and learning outcomes of each program and their assessments.

I. Program: Bachelor of Science in Electrical Engineering (BSEE)

1. Program Mission

To prepare electrical engineering graduates possessing knowledge and skills necessary for successful employment and further study.

2(a). Program Outcomes

The BSEE Program will produce graduates who within one year following graduation will be employed in the field of electrical engineering and/or pursuing graduate studies and who within five years following graduation will have:

- progressed in their career as shown by promotions, positions of leadership, awards, products developed, entrepreneurial activities, patents, publications, etc.;
- advanced their knowledge and expertise as shown by continuing education, advanced degrees, professional registration, etc.; and
- contributed to the profession and society as shown by professional service, community service, public service, etc.

2(b). Learning Outcomes

Graduates of the BSEE Program will be able to demonstrate:

1. an ability to apply knowledge of mathematics, science, and engineering to the analysis of electrical engineering problems [ABET Engineering Criterion 3(a)],
2. an ability to design and conduct scientific and engineering experiments, as well as to analyze and interpret data [ABET Engineering Criterion 3(b)],

3. an ability to plan, specify, design, implement, and operate a system, component, or process to meet desired needs [ABET Engineering Criterion 3(c)],

4. an ability to function on multidisciplinary teams [ABET Engineering Criterion 3(d)],

5. an ability to identify, formulate, and solve electrical engineering problems [ABET Engineering Criterion 3(e)],

6. an understanding of professional, legal, and ethical responsibility [ABET Engineering Criterion 3(f)],

7. an ability to convey technical material through formal written work products which satisfy accepted standards for writing style [ABET Engineering Criterion 3(g)],

8. an ability to convey technical material through oral presentation and interaction with an audience [ABET Engineering Criterion 3(g)],

9. a broad education and knowledge of contemporary issues necessary to understand the impact of electrical engineering solutions in a global and societal context [ABET Engineering criterion 3(h and j)],

10. a recognition and appreciation of the need for, and ability to engage in life-long learning and critical thinking [ABET Engineering Criterion 3(i)],

11. an ability to use modern engineering techniques, skills, and tools, including computer-based tools, necessary for analysis and design [ABET Engineering Criterion 3(k)],

12. a knowledge of mathematics through differential and integral calculus, and introduction to differential equations, linear algebra, and complex variables [ABET Electrical Engineering Program Criteria],

13. a knowledge of probability and statistics, including electrical engineering applications [ABET Electrical Engineering Program Criteria],

14. a broad knowledge of basic sciences and engineering sciences necessary to analyze and design complex devices and systems [ABET Electrical Engineering Program Criteria]
II. Program: Bachelor of Science in Computer Engineering (BSCmpE)

1. Program Mission

To prepare computer engineering graduates possessing knowledge and skills necessary for successful employment and further study.

2(a). Program Outcomes

The BSCmpE Program will produce graduates who within one year following graduation will be employed in the field of computer engineering and/or pursuing graduate studies and who within five years following graduation will have:

- progressed in their career as shown by promotions, positions of leadership, awards, products developed, entrepreneurial activities, patents, publications, etc.;
- advanced their knowledge and expertise as shown by continuing education, advanced degrees, professional registration, etc.; and
- contributed to the profession and society as shown by professional service, community service, public service, etc.

2(b) Learning Outcomes

Graduates of the BSCmpE Program will be able to demonstrate:

1. an ability to apply knowledge of mathematics, science, and engineering to the analysis of computer engineering problems [ABET Engineering Criterion 3(a)],

2. an ability to design and conduct scientific and engineering experiments, as well as to analyze and interpret data [ABET Engineering Criterion 3(b)],

3. an ability to plan, specify, design, implement, and operate a system, component, or process to meet desired needs [ABET Engineering Criterion 3(c)],
4. an ability to function on multidisciplinary teams [ABET Engineering Criterion 3(d)],

5. an ability to identify, formulate, and solve computer engineering problems [ABET Engineering Criterion 3(e)],

6. an understanding of professional, legal, and ethical responsibility [ABET Engineering Criterion 3(f)],

7. an ability to convey technical material through formal written work products which satisfy accepted standards for writing style [ABET Engineering Criterion 3(g)],

8. an ability to convey technical material through oral presentation and interaction with an audience [ABET Engineering Criterion 3(g)],

9. a broad education and knowledge of contemporary issues necessary to understand the impact of computer engineering solutions in a global and societal context [ABET Engineering criterion 3(h and j)],

10. a recognition of the need for, and ability to engage in life-long learning and critical thinking [ABET Engineering Criterion 3(i)],

11. an ability to use modern engineering techniques, skills, and tools, including computer-based tools, necessary for analysis and design [ABET Engineering Criterion 3 (k)],

12. a knowledge of mathematics through differential and integral calculus, discrete mathematics, and an introduction to differential equations, linear algebra, and complex variables. [ABET Computer Engineering Program Criteria],

13. a knowledge of probability and statistics, including computer engineering applications [ABET Computer Engineering Program Criteria],

14. a knowledge of basic sciences and engineering sciences necessary to analyze and design complex devices and systems that include both hardware and software components [ABET Computer Engineering Program Criteria],

III. Undergraduate Program Assessment

1. Assessment Process

Achievement of program outcomes is assessed on a three year cycle whereas that of learning outcomes is assessed on an annual cycle. The assessment tools used for program outcomes are:
1. Alumni Survey
2. Senior Design Evaluation
3. Faculty Course Assessment
4. Senior Exit Interview

2. Results of Assessments

The assessment of learning outcomes has been conducted during each of the last five years. During 2008-09 academic year, ABET accreditation team visited and evaluated the programs. The BSEE and BSCmpE programs received ABET accreditation in 2009 based partly on the assessments of the outcomes of the two BS programs during the previous years. Based on the recommendation of the ABET visiting team, the Program Educational Objectives (Program Outcomes in SACSCOC terminology) were revised. The revised outcomes are listed at the beginning of this report. Following this model, the ECE Assessment Committee performed assessments of the learning outcomes of the two programs in 2009-10 year. The results of the assessment are presented in Appendix I to IV. The Final Statement of the ABET Accreditation Team is available with the Dean of Engineering.

3. Summary of Key Continuous Improvement Achievements:

It may be seen from the table that most of the learning outcomes are achieved to the desired degree. The outcomes (for example outcomes 13 and 15 during the year 2009-10 exit interviews) that were not achieved to the desired degree were brought to the attention of faculty so that instruction can be strengthened in those areas. Further, based on the above assessments and ABET visiting Team recommendations, the Department has taken a number of actions, chief among them are the following:

1. In the faculty course assessment and exit interviews, it was reported that the time required for Capstone design courses was much more than that allotted by the credit hours specified for the courses. Based on this feedback, the Capstone Design courses were strengthened by making them first into two 2-credit courses during 2008-09 year and then into two three-credit courses starting from 2011-12 academic year.
2. Student feedback as well as instructor feedback indicated that ISE 3920 is not sufficiently motivating the students to perform the required degree. Therefore the project management component is integrated into the Design courses and the ISE 3920 Fundamentals of Engineering Design is deleted from the curricula. Stating from Spring 2012 semester, a seminar course ECE 4910 Professional Issues in ECE will be offered.
to teach the students various professional issues such as professional ethics.

3. As per the ABET Team observation, in 2009 the Discrete-Time Signals and Systems course was made a required course for BSEE and BSCmpE curricula so that all EE and CmpE graduates will have the knowledge in discrete-time signals and systems. Previously this was a junior elective course.

4. To meet the needs of students as demonstrated in various exit interview sessions, a programmable logic controllers (PLC) lab course has been developed and offered starting from 2009 Fall semester. A separate PLC lab has also been established.

The above changes were made as a result of yearly assessments. The following action (Action 5) has been taken as a result of the requirement by the State of Tennessee.

5. To facilitate the smooth transfer of community college students into the programs, as required by the State of Tennessee, certain changes to the curriculum were made in 2010.

Actions 6, 7 and 8 have been taken as a result of faculty efforts to keep up the program and facilities current.

6. To improve job opportunities to EE graduates in manufacturing industries, a mechatronics concentration in BSEE program has been developed and is being offered starting from Spring 2012.

7. A new Electrical Energy and Power lab has been established to improve laboratory instruction to ECE students.

8. A Circuits and Signals Tutoring has been initiated to provide assistance to students in the learning of fundamental materials and improve retention in the ECE program. The effectiveness of this will be evaluated in the coming semesters.

The students’ feedback during exit interviews and meetings with Industrial Advisory Board Members has been very positive of these developments.

Prior to the ABET visit in 2008, the previous Program Outcomes were assessed with positive results as presented in the Self Study Report. The new cycle of assessment of the revised Program Outcomes for BSEE and BSCmpE will be performed during 2011-2012 academic year.

IV. Program: Master of Science in Electrical and Computer Engineering (MSECE)

Consistent with the missions of the University, the College of Engineering and the ECE Department, keeping in view the needs of the students, industry and
faculty, the ECE Department has developed the following Program Outcomes and Learning Outcomes for the MSEE program. A process consisting of assessments and actions is also outlined to ensure that these outcomes are achieved on a regular basis.

1. **Program Mission**

The MSEE program will prepare graduates with advanced knowledge in selected areas of electrical and computer engineering so that they can engage successfully in research and development of new systems and products and be ready to undertake doctoral studies. This program will provide opportunities to students and trained research and development engineers to industries and organizations.

2(a) **Program Outcomes**

The MSEE Program will

1. provide electrical and computer engineering graduates opportunities to prepare themselves for research and product development related careers in selected electrical and computer engineering fields.

2. provide industries and society qualified electrical engineers possessing knowledge in the state of the art topics in evolving fields and abilities to develop and manage modern electrical engineering technologies for continued growth and global competitiveness.

3. inspire electrical engineering students to undertake doctoral study that prepares them for challenging careers in teaching, research, and development and to provide them with opportunities for internships in teaching and research.

4. establish and foster an environment in the department that promotes research and scholarly activities such that competent faculty members are attracted and retained, national and international visibility is gained, and the quality and reputation of the undergraduate program are enhanced.

2(b). **Assessment Methods**

1. Survey of graduates after one year of their graduation to assess the types of jobs they have obtained and to determine the number of graduates who have pursued studies towards Ph.D.

2. Survey of the immediate supervisors of the graduates in their work place should indicate that these graduates possess necessary advanced knowledge and expertise to meet the needs of industry.
2(c). Assessment Process

1. Each summer, students who graduated with an MSEE degree during the academic year one year before the summer will be requested to complete a survey with questions relevant to Program Outcomes listed above. The graduates will also be asked to provide the names and contact addresses of their immediate supervisors.

2. The immediate supervisors of the graduates in their work place will be requested to complete a survey providing information on the performance of the graduates relevant to the program outcomes listed above.

3. The completed and returned survey forms will be summarized and the results will be utilized to determine to the extent the program outcomes have been achieved. Recommendations will be made to the department on actions to be taken to remove any deficiencies in the program and also to enhance the achievement of the outcomes.

3(a). Learning Outcomes

The graduates of the MSEE program at Tennessee Tech will demonstrate

1. expertise and in-depth knowledge in one or more of the following areas of electrical engineering: circuit analysis and design; signal and image processing; control, instrumentation and robotics; digital and computer engineering; electrical machines and power systems; electro-magnetics, laser and other physical phenomena; software engineering; and telecommunications and networks,

2. analytical and critical thinking skills and higher levels of cognizant abilities as synthesis and evaluation,

3. a high level of written and oral communication abilities enabling them to inform and persuade others effectively,

4. an ability to conduct literature search and self-study promoting their capacity for change and growth,

5. mastery of research and investigation in the discipline through thesis, research papers, literature reviews, reports or case studies, and

6. an awareness of professionalism and ethics in the conduct of research and dissemination of its results.

3(b). Assessment Methods

1. Courses in the program of study and grades in the courses should indicate expertise and in-depth knowledge in one or more areas of electrical engineering.
2. For thesis option students, the thesis and its oral defense should demonstrate their ability to conduct literature search and research in the discipline and disseminate effectively in written and oral communication forms.

For non-thesis option students, reports and presentations in courses and comprehensive examination should demonstrate their ability to conduct literature search and research and communicate effectively in written and oral communication forms.

3. Each graduating student will complete a survey. An analysis of the survey should indicate that students have acquired the knowledge, skills and abilities indicated in the Learning Outcomes 1 to 6 above.

3©. Assessment Process

1. The Committee that conducts thesis defense or the comprehensive examination will report about the written and oral communication abilities of the student
2. Each student’s papers, reports, etc. in various courses will be submitted at the time of comprehensive examination. These will be examined by the committee conducting the comprehensive examinations to assess the abilities of the students relating to literature search, research abilities, etc. and make a report.
3. By the time students submits the final copy of the thesis to the Graduate School, the students will be asked to complete an exit survey to assess the extent to which each student is confident of the various learning outcomes.
4. The results of the various assessments will be analyzed and recommendations to remove any deficiencies and enhance the level of achievement of the outcomes will be submitted.

4. Results of Assessment

In 2008, the MSEE program went through an external visitor assessment. The Self-study report prepared for the visit is available in the ECE Department. Based on this report and the meetings the visitor had with faculty, staff and students, the visitor submitted a report which is also available in the ECE Department. While the overall assessment of the program and the students was very positive, the visitor also made some important suggestions.

5. Actions based on Assessment

Based on the report by the external visitor and discussions by the faculty, the emphasis on Ph.D. program was increased and efforts were made to increase the number of Ph.D. students. As a result the number of Ph.D. students
increased from 16 in 2005 to 28 in 2010. To increase the number of TTU students pursing graduate studies, a fast track MS program was implemented.

Also taking into account of the visitor’s suggestion of close co-operation between CSC and ECE Departments, the Computer Science Department has been brought into the College of Engineering from the College of Arts and Science with effect from July 2011. Also a joint faculty appointment between CSC and ECE Department has been implemented.

To enhance the research capabilities of students they are encouraged to participate in the Annual Research Day participation. Number of students participating in this event has increased from 18 in 2008 to 33 in 2010.
Appendix I

Electrical and Computer Engineering Department
Assessment of Fall 2009 - Spring 2010 Alumni Survey
Assessment Committee

Summary:

This summary is for the Fall 2009 and Spring 2010 BS Alumni Surveys, including the alumni one year after graduation and the alumni six years after graduation.

Two tabular weighted average summaries are shown. The one year alumni results show that all outcomes met or exceeded the benchmarks. The six year alumni were also asked to respond to the level of attainment of the program objectives. It is observed that the attainment of the ECE program objectives is satisfactory (but unreliable since only one response was obtained). A method for improving the response rate is needed. One possible way is to send paper surveys with paid return envelope to those alumni with known physical address.

ONE -YEAR ALUMNI SURVEY RESULTS

One year Alumni were asked to respond to “As a result of my TTU engineering education, I am well prepared to:…”, followed by a question on each of the program education outcomes. They were also asked about their job title and whether they are planning to or seeking a graduate degree.

ECE program objectives

Within one year following graduation, our graduates will be:

- employed in the field of electrical and computer engineering and/or
- pursuing graduate studies

Observations:

The 2010 one-year alumni survey results are based on ten survey forms returned on surveymonkey.com. The results show that in most of the categories, the responses were similar to those of the previous years within statistical variability. All outcomes were more than the desired minimum of 3.5 (including outcome#8 which was below desired minimum in 1 year alumni survey in 2007). Eight Alumni (out of 9 responded) stated they are either planning/currently enrolled or already received a post-bachelor’s degree.

Compiled information from the Comments Section:

Alumni were asked to comment on strengths and weakness of TTU ECE education. Some of the strengths reported were:

- Ability to understand why a solution is the right one.
- Multidisciplinary and multicultural interaction
- Great professors with outstanding knowledge

Some of the weakness reported were:

- Not covering details in senior classes
- Lack of diversity
- Not enough amount of hands-on experience
- No distance learning
- Effectiveness of Capstone Design
**Information about Current work assignments** (derived from question #29: Current work assignments. Some respondents chose more than one category)

Design  4  
Manufacturing  1  
Research and Development  3  
Sales/Marketing  1  
Management  2  
Graduate School  
Environmental  
Other (Testing)  3

### Alumni Survey Summary (one year after graduation)

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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Number of responses</strong></td>
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<td>5</td>
<td>6</td>
<td>17</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td><strong>Number of graduates</strong></td>
<td>70</td>
<td>43</td>
<td>48</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>1. Applying math, science, &amp; engineering knowledge</td>
<td>4.9</td>
<td>4.6</td>
<td>4.2</td>
<td>4.1</td>
<td>4.2</td>
<td>4.4</td>
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<td>2. Experimentation</td>
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<td>4.0</td>
<td>4.1</td>
<td>4.2</td>
<td>4.0</td>
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<tr>
<td>3. System design</td>
<td>3.7</td>
<td>4.0</td>
<td>3.8</td>
<td>4.1</td>
<td>4.1</td>
<td>3.9</td>
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<tr>
<td>4a. Teams</td>
<td>3.8</td>
<td>4.6</td>
<td>4.5</td>
<td>4.6</td>
<td>4.6</td>
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<td>4b. Multidisciplinary teams</td>
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<td>4.5</td>
<td>4.2</td>
<td>4.3</td>
<td>4.0</td>
<td>3.9</td>
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<tr>
<td>5. Problem Solving</td>
<td>4.7</td>
<td>4.4</td>
<td>4.3</td>
<td>4.0</td>
<td>4.3</td>
<td>4.4</td>
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<td>6. Ethics</td>
<td>4.8</td>
<td>4.4</td>
<td>4.7</td>
<td>4.3</td>
<td>4.5</td>
<td>4.3</td>
</tr>
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<td>7a. Writing</td>
<td>4.7</td>
<td>4.6</td>
<td>4.3</td>
<td>3.7</td>
<td>4.4</td>
<td>4.3</td>
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<td>7b. Oral Presentation</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Global impact</td>
<td>4.3</td>
<td>3.8</td>
<td>3.3</td>
<td>3.6</td>
<td>3.7</td>
<td>3.3</td>
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<td>9. Life-long learning</td>
<td>4.4</td>
<td>4.6</td>
<td>4.5</td>
<td>4.4</td>
<td>4.6</td>
<td>4.4</td>
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<td>10. Contemporary issues</td>
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<td>4.2</td>
<td></td>
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<td></td>
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<td>11a. Modern techniques</td>
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<td>3.7</td>
<td>4.7</td>
<td>4.0</td>
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<td>11b. Computer-based tools</td>
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<td>4.1</td>
<td>4.2</td>
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<td>12. Advanced Math</td>
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<td>4.0</td>
<td>3.8</td>
<td>4.0</td>
<td>3.7</td>
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<tr>
<td>13. Probability/statistics</td>
<td>4.4</td>
<td>3.6</td>
<td>3.7</td>
<td>3.3</td>
<td>3.7</td>
<td>3.2</td>
</tr>
<tr>
<td>14. Complex system design</td>
<td>4.3</td>
<td>4.4</td>
<td>3.5</td>
<td>3.7</td>
<td>3.9</td>
<td>3.8</td>
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<tr>
<td>15. Project management</td>
<td>4.0</td>
<td>4.0</td>
<td>3.7</td>
<td>3.7</td>
<td>3.9</td>
<td>3.5</td>
</tr>
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</table>

**FIVE YEAR ALUMNI SURVEY RESULTS**

The survey of the 5-year alumni who graduated in the year 2005 is based on a single response received. It is worth mention that this tool was not sent on time (due to staff change) and was sent in the summer of 2011 (six years after graduation).

**ECE program objectives**

Within five years following graduation, our graduates will have:

- A) Progressed in their careers as measured by indicators such as promotions, positions of leadership, awards, recognitions, entrepreneurial activities, products or processes developed, patents, and/or publications;
- B) Advanced their knowledge and expertise as measured by indicators such as continuing education, advanced degrees, and/or professional registration;
• C) Contributed to the profession and society as measured by indicators such as professional service, community service and/or public service.

To measure the program objectives listed below, the graduates of the 2005 were asked specific questions, and these were their collected answers:

**Q1: What do you consider the greatest strengths of your TTU ECE education?**
- A good background knowledge in the fields I studied in TTU. Many open minded professors helped promote creativity- something more important than book-smarts.

**2: What do you consider the greatest weaknesses of your TTU ECE education?**
- Lack of hands on learning- most classes focus only on theory but the real work force is almost entirely hands on applications of that theory. This caused learning curve when entering my first job after attaining my bachelors. TTU needs more hands on at all stages of the bachelors program (freshmen through senior)

**Q3: Do you plan to continue your formal education?**
- I have already received a post-bachelor's degree. I received a PhD from TTU in December 2009.

**Q4: If applicable, please give one or two examples of each of the following received or accomplished in your career:**

<table>
<thead>
<tr>
<th>Patents</th>
<th>Publications</th>
<th>Grants/Projects funded</th>
<th>Promotions</th>
<th>Projects completed</th>
<th>Professional Membership</th>
<th>Awards</th>
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<tbody>
<tr>
<td>1</td>
<td></td>
<td>5(4 are first author)</td>
<td>Yes</td>
<td>Yes</td>
<td>IEEE, research mentor</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Q5: My current job is:**
- Research associate, University of Alberta. Edmonton, Alberta-Canada.

**Q6: Current work assignments:**
- Sales/Marketing
- Design
- Test/Reliability
- Management 1
- Research and Development 1
- Manufacturing
- Other:

**Note on Five Year Alumni Survey Results**

By analyzing the single response of the participant, the ECE assessment committee realized that even though the participant response was collected a year after the normal data collection time, it was a worthy example of an accomplished graduate. See for example response on Q4.
Appendix II

Electrical and Computer Engineering Department
Assessment of Spring 2010 Capstone Design Experience
Assessment Committee

Summary

A Senior Capstone Design Project was held on April 20, 2010 for 10 ECE 4970 teams to present their final oral presentations to a constituency of:

- Student peers of other teams
- IAB alumni engineers
- ECE Faculty
- Industry Client Engineers

Members from these groups gave their assessment of the projects on various criteria. These assessments were averaged over all projects for each criterion and these are given in Appendix A. It is noted that in all categories, the average score is well above the minimum desired score of 3.5.

Comment

The ten criteria that were assessed do not cover all the program outcomes desired from this course. The faculty course assessment and detailed assessment by industry client were not received.

Suggestions

Faculty course assessment and industry client assessment should be collected and analyzed with respect to outcomes which were not assessed in the oral presentation survey.
## Appendix A

### ECE Capstone Design Assessment (Spring 2010)

<table>
<thead>
<tr>
<th>No</th>
<th>Project Name</th>
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<th>#2</th>
<th>#3</th>
<th>#4</th>
<th>#5</th>
<th>#6</th>
<th>#7</th>
<th>#8</th>
<th>#9</th>
<th>#10</th>
</tr>
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<tr>
<td>1</td>
<td>Interface Card Design for Range Sensing</td>
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<td>4.00</td>
<td>4.50</td>
<td>4.33</td>
<td>4.60</td>
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<td>4.80</td>
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<tr>
<td>2</td>
<td>Improved RFID Tracking System Design</td>
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<td>4.71</td>
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<td>4.63</td>
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<tr>
<td>3</td>
<td>Hybrid Vehicle Control System</td>
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<td>GPS Interface module Design</td>
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<td>Automatic Wiring Software Design</td>
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### Assessment Criteria

1. Clarity of Problem Statement
2. Degree to which the team accomplished their deliverables (Project completion)
3. Degree to which design meets specifications
4. How well the team functions
5. Demonstrated professionalism and ethical responsibility
6. Organization of oral presentation
7. Effective use of presentation time
8. Effective interaction with audience
9. Effective use of visual aids
10. Overall quality of project work and presentation
Appendix III
Electrical and Computer Engineering Department
Faculty Course Assessment for Fall 2009 - Spring 2010

Summary:
This summary is for the Fall 2009, Spring 2010 Faculty course assessments. The weighted average of course outcome assessment is calculated for all courses. Most courses achieved a score above 3.5. Only four courses achieved a weighted average below 3.0. These courses are 3710, 3860, 4630 in Fall 2009 and 3540 in Spring 2010. Details of faculty assessments and weighted average for course outcomes are attached.

Achievement of Course Outcomes
Some course outcomes were rated by faculty as “Fair”. These courses were 2000, 2060, 3910, 3810, 3860, and 4610 in Fall 2009 and 2020, 2060, 2110, 3010, 3300, 3540, 3710, 3810, 3910 and 4720 in Spring 2010. In addition, a few course outcomes had received either a “Poor” or “Unable to perform/Not Covered” ratings. These courses were 2060, 3010, 3760, and 4630 in Fall 2009 and 3540, 3610, 3710, 3810, 4720 in Spring 2010.

Comments received
No comments were received on Fall 2009 forms done online on Surveymonkey.com. A few comments were received on paper forms returned by faculty on Spring2010.

Student Preparedness:
A few comments were received on student preparedness. Of those comments, several were positive. However, in six courses, 2000, 2010, 3010, 3120, 3510, and 3710 the comments included students are:

- having problems with computer programming ECE2000
- unable to handle metric prefixes properly ECE 2010
- not having confidence in MATLAB programming, or having difficulty in integration/programming. ECE3010
- not adequately prepared for programming in ECE3120
- poorly prepared in ECE 3510 and ECE3710

Course Syllabi:
Comments included suggestions to update the syllabi for the following courses.

- 3120: suggest a prerequisite course on algorithm design
- 3540: suggest remove objective#3, and outcome#2. Suggest to add outcomes on optoelectronics, photonics, MEMS, nanotechnology
- 3610: suggest move outcome #5 to ECE4630

Action items for assessment committee
Some forms needed update/typo corrections. These include forms for three courses 3010, 4120, and 4720 as indicated in the appendix #2 in brackets.
Appendix IV

Electrical and Computer Engineering Department

Assessment of Fall 2009 - Spring 2010 Senior Exit Interview

Summary

The Exit Interview Assessment responses indicate that for the EE and CmpE program combined; satisfactory achievement of all outcomes meets the benchmark of 3.5 but one outcome. The outcome which falls below the 3.5 benchmark is outcome#13: Probability/statistics (average score 3.38). It is recommended that achievement of this outcome be observed for a few more years before developing any remedial measures.

Observations:

A summary of the students’ responses during senior exit interview is provided in the following tables.

Table 1, shows the summary of senior exit interviews for Fall 2009 and Spring 2010 and Table 2, shows the summary for combined Fall 2009 & Spring 2010. Here results are available only for EE and CmpE together. No separate result for EE or CmpE is available. From the tables, it is observed that:

For EE & CmpE programs combined, one outcome has below the desired 3.5 average:

Outcome 13: Probability/statistics: 3.38

The averages have been computed by taking Fall and Spring responses together. Table 3 shows the results for the previous years.

Outcome #15: shows an improvement compared to the previous year result. In the previous year, Outcome#15 had an average of 3.44 whereas this year’s average is 3.61 which is above the benchmark 3.5.

Actions Proposed:

Continue to watch the achievements of Outcomes#13 and 15. No additional action is proposed at this time.
Table 1. Summary of Senior Exit Interviews for Fall 2009 and Spring 2010

**Electrical Engineering & Computer Engineering Majors combined Fall09**

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**Electrical Engineering & Computer Engineering Majors combined Spring10**

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