Expected Outcome 1: A knowledge of Contemporary Issues

By the time they complete the PFEN program, students will be able to develop a knowledge of contemporary issues which include the latest developments and state of the art in polymer and fiber profession. Examples include lightweight and energy efficient composite structures, graphene, 3D polymer printing, etc. For example, Deepwater Horizon oil spill was covered in the classes and students were asked to design an oil boom to clear the sea water from oil. Students are made aware of contemporary issues in their classes, from their membership in professional societies, and by the availability of trade and profession publications such as MRS Bulletin, Materials Today, Prism, Textile World, Southern Textile News, Chemical and Engineering News, Mechanical Engineering, Materials Today and Textile Chemist and Colorist. These publications are available in the department's learning resource center. Visits to local industries and presentations by local industrial leaders help expand their knowledge of contemporary issues. Plant trips are scheduled every semester for PFEN classes we the students visit local manufacturing plants with their professors. Moreover, company representatives are invited to give seminars to PFEN students. PFEN students solve contemporary, real life problems of these companies in their senior design classes PFEN 4810 and 4820.

Assessment Method 1: Exit Interviews

Assessment Method Description
Exit interviews are conducted with graduating seniors in order to determine their experiences, both positive and negative, throughout their time in the department. Each senior, prior to graduation, is asked to sit for a confidential exit interview with the department head. Their feedback is taken into consideration at many levels. All exit interviews center around 3 questions:

• What did you consider positive/what did we do well?
• Where do we need to improve?
• Any additional comments?
Keeping confidentiality, the department head shares the perceived strengths and weaknesses with the faculty.

Findings
There were no negative comments or suggestions for improvements during
the exit interviews for this outcome. One student commented that real world problems are covered well. Another student stated that industrial involvement in senior design was a positive thing in the Department; however, another student suggested not to involve companies for senior design projects (possibly due to lack of timely communication from that particular company). Company visits were liked by the students.

The number of students interviewed depends on the number of students graduating that semester as follows:

Spring 2012: 6 fiber option students, 2 polymer option students
Fall 2012: 2 fiber option students
Spring 2013: 10 fiber option students, 12 polymer option students

The answers to questions vary by the students. For example, one student commented that he liked the senior design experience which provided many opportunities to work with outside companies. Full copies of senior exit interviews are available.

**How did you use findings for improvement?**

It is the faculty's feeling that it is beneficial to the students to have company's involved in senior design to expose them to contemporary issues. As a result, we are working with local companies in senior design projects to solve their product, process and manufacturing problems. The results have been mutually beneficial for all.

**Additional Comments**

**Assessment Method 2: Senior Student Survey**

**Assessment Method Description**

Every year a senior student survey is conducted through the College of Engineering to assess various educational objectives under the Engineering Benchmarking Initiative (EBI). Questions are asked about general college education as well as specific education relative to each department and then compared to results from other universities. Due to the limited number of similar engineering programs in the U.S., the PFEN program is listed as "other" in the survey.

**Findings**

29% of the senior students indicated that they were able to apply their knowledge of contemporary issues facing society in their engineering classes and design projects extremely well; 29% said very well. However, 43% rated this outcome below "moderately well".

**How did you use findings for improvement?**

The faculty was made aware of the statistics.

**Additional Comments**

**Assessment Method 3: Faculty Evaluation**
Assessment Method Description
Faculty members are asked to evaluate students’ performance for each outcome for every class using a rating from 1 (not at all) to 5 (completely). The faculty evaluates student performance relative to their achievement of the desired outcomes. Summaries for Fall 2012 and Spring 2013 semesters are below. The full reports of the faculty for each semester are available.

Findings

PROGRAM OUTCOMES SUMMARY

Department of Polymer and Fiber Engineering – Fall 2012

Program Outcomes
a. An ability to apply knowledge of mathematics, science and engineering
b. An ability to design and conduct experiments, as well as analyze and interpret data
c. An ability to design a system, component, or process to meet desired needs
d. An ability to function on multi-disciplinary teams
e. An ability to identify, formulate, and solve engineering problems
f. An understanding of professional and ethical responsibility
g. An ability to communicate effectively
h. A broad education necessary to understand the impact of engineering solutions in a global and societal context
i. A recognition of the need for, and ability to engage in lifelong learning
j. A knowledge of contemporary issues
k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Evaluation by the Faculty:

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<thead>
<tr>
<th>outcome</th>
<th>ENGR 1110</th>
<th>PFEN 2270</th>
<th>PFEN 3100</th>
<th>PFEN 3570</th>
<th>PFEN 4200</th>
<th>PFEN 4300</th>
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Several faculty noted the need for improvements for this outcome.

**How did you use the findings for improvement?**

Student presentations were spread through the semester to better manage current issues in the related topic areas for PFEN 4200. In PFEN 4300, contemporary issues such as BP oil spill in the Gulf of Mexico was discussed along with the ethics. In 4810 and 4820, four different companies participated in the senior design projects. An external speaker from Pratt and Whitney gave a lecture on ceramic matrix composites and their use in today's engines.
Expected Outcome 2: Design a System, Component or Process

By the time they complete the PFEN program, students will be able to develop an ability to design a system, component or process to meet desired needs. The structure and performance of polymers, fibers and fibrous materials to meet specific applications is stressed at every level. Courses in biomedical applications, industrial fabrics and composite materials give a background in designing for needs. Processes used to determine structure and design are key elements in polymer synthesis and processing, fiber spinning, fibrous product design, manufacturing and testing.

Assessment Method 1: Alumni Visits and Surveys

Assessment Method Description
Many of our graduates come for a visit of their former department, presenting their company or current job responsibilities in the form of a seminar, recruiting new graduates for their companies or visiting their former adviser or friends in the department. The department is keen on soliciting feedback from these graduates regarding their experience in the department and how its educational elements impacted their professional careers. Online alumni surveys are conducted to get feedback from our alumni.

Alumni surveys are done every five years. The last alumni survey was done in 2009. The latest alumni survey process started in Fall 2013. It is an online survey that is extended to all graduates of PFEN. 110 alumni participated in the last survey. The scale was from 1 to 7, strongly disagree to strongly agree. The survey addressed all the outcomes of PFEN programs.

Findings
There were no negative comments or suggestions for improvements from the alumni for this outcome. 83% of the alumni reported that this outcome was critical to their success; 93% said that their experience in the department prepared them well to achieve this outcome.

How did you use findings for improvement?

Additional Comments

Assessment Method 2: Senior Student Survey

Assessment Method Description
Every year a senior student survey is conducted through the College of Engineering to assess various educational objectives under the Engineering
Benchmarking Initiative (EBI). Questions are asked about general college education as well as specific education relative to each department and then compared to results from other universities. Due to the limited number of similar engineering programs in the U.S., the PFEN program is listed as “other” in the survey.

**Findings**
This outcome was favored slightly lower than the College of Engineering average. The results were shared with the PFEN faculty for continuous improvement.

**How did you use findings for improvement?**
Faculty was made aware of this result to stress the importance of the structure and performance of polymers, fibers and fibrous materials to meet the needs of specific applications.

**Additional Comments**

**Assessment Method 3: Faculty Evaluation**

**Assessment Method Description**
Faculty members are asked to evaluate students’ performance for each outcome for every class using a rating from 1 (not at all) to 5 (completely). The faculty evaluates student performance relative to their achievement of the desired outcomes. The full reports of the faculty for each semester are available.

**Findings**
This outcome was rated slightly low in some classes.

**How did you use the findings for improvement?**
Design aspect of fibrous products was given more attention in PFEN 2270; in addition, students were given more chance to have hands on experience in the labs. For PFEN 3570, it was decided to institute a different grading evaluation bases to give more emphasis on design and applied problem solving performance. In PFEN 4810 and 4820, four different companies offered projects to the students to design an system, component or process. More focus was given to design projects and a lecture was used to explain the design process in PFEN 4500.

**Additional Comments**

**Expected Outcome 3: Design and Conduct Experiments**
By the time they complete the PFEN program, students will be able to develop an ability to design and conduct experiments, as well as analyze and interpret data. In various courses of the curriculum, including the senior engineering design project, lab experiments are designed and conducted on polymers,
fibers and fibrous structures to analyze their structures and test their properties and performance. There is an emphasis on experiments and experimental design, and with these, the analysis of experimental data and interpretation of their meaning.

**Assessment Method 1:** Senior Student Survey

**Assessment Method Description**
Every year a senior student survey is conducted through the College of Engineering to assess various educational objectives under the Engineering Benchmarking Initiative (EBI). Questions are asked about general college education as well as specific education relative to each department and then compared to results from other universities. Due to the limited number of similar engineering programs in the U.S., the PFEN program is listed as “other” in the survey.

**Findings**
There were no negative comments or suggestions for improvements during the exit interviews for this outcome. The students rated this outcome higher than the average of the College of Engineering.

**How did you use findings for improvement?**

**Additional Comments**

**Assessment Method 2:** Design Project Evaluation

**Assessment Method Description**
Special forms were designed and implemented to evaluate senior design projects. Questions on this evaluation form correspond to expected outcomes as follows:

Oral Presentation  
Speaking ability:  
Quality of Visuals:  
Written Presentation  
Introduction:  
Background / Literature Review:  
Theoretical Background:  
Experimental Procedures:  
Discussion and Conclusions:  
Tables and Figures:  
If it is a team project, evaluation of the team performance:

Design projects are experimental in nature related to solving a problem for the local industry. Therefore, students improve their skills to design and conduct experiments. They analyze and interpret the data they obtained from the experiments and make recommendations to the industry.

**Findings**
26 students were evaluated in several teams. The scale was from 1 (unsatisfactory) to 5 (exemplary). The scores ranged from 2 to 5. One finding was that the slides were so encoded that it was difficult to follow; many slides in a tiny font. In another finding, cost/savings data were missing.

**How did you use findings for improvement?**
Faculty are made aware of the results to advise the future senior students to improve the design projects.

**Additional Comments**

**Assessment Method 3: Faculty Evaluation**

**Assessment Method Description**
Faculty members are asked to evaluate students’ performance for each outcome for every class using a rating from 1 (not at all) to 5 (completely). The faculty evaluates student performance relative to their achievement of the desired outcomes. The full reports of the faculty for each semester are available.

**Findings**
One class needed more lab experience for students.

**How did you use the findings for improvement?**
Twin screw extrusion lab was included in PFEN 3200 lab sessions.

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**Expected Outcome 4: Effective Communication**
By the time they complete the PFEN program, students will be able to develop an ability to communicate effectively. Effective communications are stressed in all university courses. Laboratory exercises require cogently written laboratory reports while courses with group and individual design projects (ENGR 1110, PFEN 3400, PFEN 4300, PFEN 4400, PFEN 4500 and PFEN 4820), require final written and/or oral presentations.

**Assessment Method 1: Faculty Evaluation**

**Assessment Method Description**
Faculty members are asked to evaluate students’ performance for each outcome for every class using a rating from 1 (not at all) to 5 (completely). The faculty evaluates student performance relative to their achievement of the desired outcomes. The full reports of the faculty for each semester are available.

**Findings**
Improvement of oral communication was needed in some courses.

**How did you use findings for improvement?**

In PFEN 4200, student presentations have been spread through the semester to improve oral communication. In PFEN 4300, an oral presentation was assigned with the design project. In PFEN 4400, it was decided that more focus be given to lab reports and design project to enhance the students writing skills. More oral presentations were included in PFEN 4810 to strengthen this outcome.

**Additional Comments**

**Assessment Method 2: Design Project Evaluations**

**Assessment Method Description**

Freshmen students do design projects in ENGR 1110 and senior students do senior design projects in PFEN 4810-4820. Freshman design projects are evaluated by the faculty responsible for the course and by Dr. Thomas, who is responsible for the writing initiative for the department. Senior design projects are evaluated by the PFEN faculty and lab technician. In 2012-2013, approximately 50 freshmen and 26 seniors were evaluated.

**Findings**

The comparison of the freshmen and senior reports show a drastic improvement in quality and content of the reports. There is a significant improvement in the format and scientific contents of the reports of the senior students compared to those of freshmen class. These reports are available for inspection.

**How did you use findings for improvement?**

**Additional Comments**

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**Expected Outcome 5: Engineering Impact in Global and Societal Context**

By the time they complete the PFEN program, students will be able to obtain the elements of a broad education necessary to understand the impact of engineering solutions in a global and societal context. Auburn University requires a university core curriculum of 41 credits, approximately one-third of the student's academic program that help students "... to acquire an educated appreciation of the natural world, of human life, and of the interactions between them " [1]. Specifically for PFEN students, there are exchange programs in place with Reutlingen University, Stuttgart University and the technical Universities of Dresden and Denkendorf in Germany. PFEN students attend classes there during spring semesters, and German students attend classes at Auburn during fall semesters. We are also exploring an exchange program with
Assessment Method 1: Alumni Visits and Surveys

Assessment Method Description
Many of our graduates come for a visit of their former department, presenting their company or current job responsibilities in the form of a seminar, recruiting new graduates for their companies or visiting their former adviser or friends in the department. The department is keen on soliciting feedback from these graduates regarding their experience in the department and how its educational elements impacted their professional careers.

Online alumni surveys are conducted to get feedback from our alumni. The alumni is asked how important is the broad education necessary to understand the impact of engineering solutions in a global and societal context (1: unimportant, 5: critical to success). They are also asked how well they feel that their experience in the department trained them to meet the outcome (1: little to no preparation, 5: very well prepared).

Findings
34% of our alumni stated that they felt their experience in the department trained them to meet this outcome very well, and 42% said well; only 3% said that there was little to no preparation to achieve this outcome.

How did you use findings for improvement?
The faculty was informed about the results.

Additional Comments

Assessment Method 2: Senior Student Survey

Assessment Method Description
Every year a senior student survey is conducted through the College of Engineering to assess various educational objectives under the Engineering Benchmarking Initiative (EBI). Questions are asked about general college education as well as specific education relative to each department and then compared to results from other universities. Due to the limited number of similar engineering programs in the U.S., the PFEN program is listed as “other” in the survey.

Findings
This outcome was slightly lower than the college average.

How did you use findings for improvement?
Faculty was made aware of this outcome.
**Additional Comments**

**Expected Outcome 6: Fiber, yarn and fabric properties**

The students should be able to identify different fibers, yarns and fabrics. They should be able to calculate their main characteristics.

**Assessment Method 1: Lab sessions**

**Assessment Method Description**

Students conduct experiments in the labs to identify different fibers, yarns and fabrics and calculate their properties.

**Findings**

Lab reports from the students show that the students can successfully identify different fibers, yarns and fabrics and calculate their main characteristics.

**How did you use findings for improvement?**

**Expected Outcome 7: Function on Multi-disciplinary Teams**

By the time they complete the PFEN program, students will be able to develop an ability to function on multi-disciplinary teams. PFEN is inherently multi-disciplinary requiring knowledge of materials, chemistry, physics, thermodynamics, mechanics and machinery. In the introductory course, students from all engineering disciplines work in teams to achieve the final product. The importance of multi-disciplinary teams to produce polymeric and fibrous products is reinforced in all engineering design courses.

**Assessment Method 1: Alumni Visits and Surveys**

**Assessment Method Description**

Many of our graduates come for a visit of their former department, presenting their company or current job responsibilities in the form of a seminar, recruiting new graduates for their companies or visiting their former adviser or friends in the department. The department is keen on soliciting feedback from these graduates regarding their experience in the department and how its educational elements impacted their professional careers.

Online alumni surveys are conducted to get feedback from our alumni.
**Findings**
There were no negative comments or suggestions for improvements from the alumni for this outcome. One alumni stated "I always felt fully qualified as I advanced upward in management from Shift Supervisor through Department Head, Assistant Plant Manager, Plant Manager, Vice President of Manufacturing to Corporate Senior Vice President", which indicates the ability to function on multi-disciplinary teams.

**How did you use findings for improvement?**

**Additional Comments**

**Assessment Method 2: Faculty Evaluation**

**Assessment Method Description**
Faculty members are asked to evaluate students’ performance for each outcome for every class using a rating from 1 (not at all) to 5 (completely). The faculty evaluates student performance relative to their achievement of the desired outcomes. The full reports of the faculty for each semester are available.

**Findings**
The faculty evaluations of the students revealed that team work should be emphasized more in some classes.

**How did you use findings for improvement?**
The amount of teamwork was increased for PFEN 4200. More teamwork was assigned for PFEN 4300. In PFEN 4810, teams of two or three students were formed to do the senior design project rather than individual student project in the previous years. More graded in-class activities that were performed in teams were added in PFEN 3400. Several group activities, like student presentations and group assignments, were incorporated in PFEN 3500.

**Additional Comments**

**Assessment Method 3: Senior Student Survey**

**Assessment Method Description**
Every year a senior student survey is conducted through the College of Engineering to assess various educational objectives under the Engineering Benchmarking Initiative (EBI). Questions are asked about general college education as well as specific education relative to each department and then compared to results from other universities. Due to the limited number of similar engineering programs in the U.S., the PFEN program is listed as “other” in the survey.

**Findings**
The Senior Student Survey indicated that our students rated team and extracurricular activities higher than the College of Engineering average.
How did you use the findings for improvement?

Additional Comments

**Expected Outcome 8: Identify, Formulate and Solve Engineering Problems**

By the time they complete the PFEN program, students will be able to develop an ability to identify, formulate and solve engineering problems. Many courses in the program require students to design and develop products using the appropriate technology. Students are expected to identify engineering problems and develop formulas to solve those problems with the appropriate methods and procedures. The senior design project requires students to identify a practical problem and come up with an engineering analysis and solution.

**Assessment Method 1: Senior Student Survey**

**Assessment Method Description**

Every year a senior student survey is conducted through the College of Engineering to assess various educational objectives under the Engineering Benchmarking Initiative (EBI). Questions are asked about general college education as well as specific education relative to each department and then compared to results from other universities. Due to the limited number of similar engineering programs in the U.S., the PFEN program is listed as “other” in the survey.

**Findings**

According to the Senior Student Survey, the PFEN average was slightly lower than the College of Engineering average for applying knowledge, identifying problems, system design and problem solving.

**How did you use findings for improvement?**

Faculty was made aware of this situation. Homework was made more challenging in ENGR 1110. Several problem based activities were included in PFEN 3500, including new problems assigned and solved in the classroom.

**Additional Comments**

**Assessment Method 2: Faculty Evaluation**

**Assessment Method Description**

Faculty members are asked to evaluate students’ performance for each outcome for every class using a rating from 1 (not at all) to 5 (completely). The faculty evaluates student performance relative to their achievement of the desired outcomes. The full reports of the faculty for each semester are available.

**Findings**
Some homework problems and class design projects were not adequate or challenging enough in some courses.

How did you use findings for improvement?
More challenging homework was assigned in ENGR 1110. More numerical examples were solved in PFEN 2270. Several problem based activities were included in PFEN 3100 and PFEN 3500, which included re-formulation of existing problems, addition of new problems and solving examples during lectures. Credit was given or deducted based on justification or explanation of calculation steps taken to solve problems in PFEN 3570. Problem based learning approach was increased in PFEN 4200.

Additional Comments

Expected Outcome 9: Knowledge of Mathematics, Science and Engineering
By the time they complete the PFEN program, students will be able to develop an ability to apply knowledge of mathematics, science and engineering. PFEN is an applied field and courses in the major require mastery of engineering, science, and mathematical principles for the student to be successful. From the introductory engineering class, where a group-oriented design project is an integral part, through the final senior, independent design project, the fundamentals of science, mathematics and engineering are stressed.

Assessment Method 1: Alumni Visits and Surveys

Assessment Method Description
Many of our graduates come for a visit of their former department, presenting their company or current job responsibilities in the form of a seminar, recruiting new graduates for their companies or visiting their former adviser or friends in the department. The department is keen on soliciting feedback from these graduates regarding their experience in the department and how its educational elements impacted their professional careers.

Online alumni surveys are conducted to get feedback from our alumni.

Findings
The online alumni survey indicated that 92% of the alumni felt that the knowledge of math, science and engineering that they gained was critical to their success; 93% believed that they were well prepared to apply knowledge of math, science and engineering. Some visiting alumni suggested more emphasis in certain topics in our classes; some
even suggested new classes.

**How did you use findings for improvement?**
Input from alumni surveys plays a significant role in examining and revising the Program Educational Objectives. The suggestions of the alumni are discussed in faculty meetings and decisions are made to emphasize or de-emphasize some topics in certain classes. Some courses have been modified significantly or replaced by new ones.

**Additional Comments**

**Assessment Method 2: Exit Interviews**

**Assessment Method Description**
Exit interviews are conducted with graduating seniors in order to determine their experiences, both positive and negative, throughout their time in the department. Each senior, prior to graduation, is asked to sit for a confidential exit interview with the department head. Their feedback is taken into consideration at many levels. All exit interviews center around 3 questions:

- What did you consider positive/what did we do well?
- Where do we need to improve?
- Any additional comments?

Keeping confidentiality, the department head shares the perceived strengths and weaknesses with the faculty.

**Findings**
Students commented that there is good mix of theory and practice. MATLAB/CAD should be reinforced and incorporated earlier and more in the curriculum. Some classes are “easy” with less technical content. There is also some redundancy among courses. There is a need for real understanding of polymers as materials in addition to understanding chemical and physical properties. Some classes need more content and rigor. Spread content on polymers over more (earlier) classes. More mechanics is suggested in junior level courses. There is overlap of material in polymer courses instead of more depth.

**How did you use findings for improvement?**
The survey results are shared with the faculty in the department. A committee was formed for teaching. A review of the fiber and polymer curriculums has begun by the faculty. The review will involve possible elimination/addition of courses and restructuring of some course syllabi.

**Additional Comments**

**Assessment Method 3: Faculty Evaluation**

**Assessment Method Description**
Faculty members are asked to evaluate students’ performance for each
outcome for every class using a rating from 1 (not at all) to 5 (completely). The faculty evaluates student performance relative to their achievement of the desired outcomes. The full reports of the faculty for each semester are available.

Findings
In some classes, this outcome was evaluated lower than some other outcomes by the faculty.

How did you use the findings for improvement?
Corrective actions were taken by the individual faculty to improve this outcome. For example, credit was given or deducted on tests and homework in PFEN 3570 based on justification or explanation of calculation steps taken to solve problems.

Additional Comments

Expected Outcome 10: Life-long Learning
By the time they complete the PFEN program, students will be able to develop a recognition of the need for, and ability to engage in life-long learning. Throughout their courses in PFEN, students come in contact with the dynamic nature of the field and are made aware that what they are currently learning will most probably be different than what they will encounter several years hence. The importance of keeping abreast with new developments is reinforced using field trips to local trade and machinery shows. Another way to satisfy the life-long learning outcome is to have alumni/industry people to provide lectures in our classes in addition to the regular graduate seminars in the PFEN, which are open to undergraduate students.

Assessment Method 1: Faculty Evaluation

Assessment Method Description
Faculty members are asked to evaluate students’ performance for each outcome for every class using a rating from 1 (not at all) to 5 (completely). The faculty evaluates student performance relative to their achievement of the desired outcomes. The full reports of the faculty for each semester are available.

Findings
Some faculty noted that there would be a need for improvement for this outcome in some courses.

How did you use findings for improvement?
In PFEN 4300, it was decided that more outside reading be assigned. In 4400, students were required to read material from different books. Field trips were included for ENGR 1110 and PFEN 3500.
Videos and movies were presented to PFEN 3500 class to reinforce the concepts learned during the lectures.

Additional Comments

Assessment Method 2: Senior Student Survey

Assessment Method Description
Every year a senior student survey is conducted through the College of Engineering to assess various educational objectives under the Engineering Benchmarking Initiative (EBI). Questions are asked about general college education as well as specific education relative to each department and then compared to results from other universities. Due to the limited number of similar engineering programs in the U.S., the PFEN program is listed as “other” in the survey.

Findings
14% of the senior students felt that their engineering education prepared them to learn new engineering concepts independently extremely well; 57% said very well, 14% said well and 14% said moderately well.

How did you use findings for improvement?
The faculty was made aware of the statistics.

Additional Comments

Expected Outcome 11: Professional and Ethical Responsibility
By the time they complete the PFEN program, students will be able to develop an understanding of professional and ethical responsibility. All students are required to take at least one course in ethics. Students are strongly encouraged to become active in professional societies and fraternities — e.g., Phi Psi, American Society of Mechanical Engineers (ASME), American Society of Materials (ASM), American Institute of Chemical Engineers (AIChe), American Chemical Society (ACS) — that have an active component dedicated to professional standards and ethics. In addition, many classes devote time to discuss issue related to ethics. Professional and academic behavior is strongly reinforced in classroom work and assigned projects.

Assessment Method 1: Alumni Visits and Surveys

Assessment Method Description
Many of our graduates come for a visit of their former department, presenting their company or current job responsibilities in the form of a seminar, recruiting new graduates for their companies or visiting their
former adviser or friends in the department. The department is keen on soliciting feedback from these graduates regarding their experience in the department and how its educational elements impacted their professional careers.

Online alumni surveys are conducted to get feedback from our alumni.

**Findings**
There were no negative comments or suggestions for improvements from the alumni visits and surveys for this outcome. 47% of our alumni felt that their experience in the department trained them very well for this outcome and 32% felt well.

**How did you use findings for improvement?**

**Additional Comments**

**Assessment Method 2: Senior Student Survey**

**Assessment Method Description**
Every year a senior student survey is conducted through the College of Engineering to assess various educational objectives under the Engineering Benchmarking Initiative (EBI). Questions are asked about general college education as well as specific education relative to each department and then compared to results from other universities. Due to the limited number of similar engineering programs in the U.S., the PFEN program is listed as “other” in the survey.

**Findings**
There were no negative comments or suggestions for improvements from the senior student surveys for this outcome. According to the EBI survey, 29% of our students stated they were able to apply their knowledge of environmental and safety issues in their engineering classes and design projects extremely well and 43% said well.

**How did you use findings for improvement?**

**Additional Comments**

**Expected Outcome 12: Techniques, Skills, and Modern Engineering Tools**
By the time they complete the PFEN program, students will be able to develop an ability to use the techniques, skills and modern engineering tools necessary for engineering practice. The department maintains state-of-the-art equipment and computers for student use. Many
classes utilize hands-on experiences in labs or on computers to help students grasp basic engineering principles. PFEN students learn how to use various analytical tools, numerical tools and laboratory instruments.

**Assessment Method 1:** Faculty Evaluation

**Assessment Method Description**
Faculty members are asked to evaluate students’ performance for each outcome for every class using a rating from 1 (not at all) to 5 (completely). The faculty evaluates student performance relative to their achievement of the desired outcomes. The full reports of the faculty for each semester are available.

**Findings**
State of the art teaching equipment in classes has been a concern of faculty.

**How did you use findings for improvement?**
The upper administration was made aware of this situation. As a result, new teaching equipment was installed in classroom 119.

**Additional Comments**

**Assessment Method 2:** Alumni Visits and Surveys

**Assessment Method Description**
Many of our graduates come for a visit of their former department, presenting their company or current job responsibilities in the form of a seminar, recruiting new graduates for their companies or visiting their former adviser or friends in the department. The department is keen on soliciting feedback from these graduates regarding their experience in the department and how its educational elements impacted their professional careers.

Online alumni surveys are conducted to get feedback from our alumni.

**Findings**
There was no negative comments or suggestions for improvements from the alumni for this outcome. One alumni stated: "Although I am not employed in the textile field, I feel I obtained many valuable skills (communication, methodology, problem solving, etc.) through my education at Auburn".

**How did you use findings for improvement?**

**Additional Comments**

**Assessment Method 3:** Senior Student Survey

**Assessment Method Description**
Every year a senior student survey is conducted through the College of
Engineering to assess various educational objectives under the Engineering Benchmarking Initiative (EBI). Questions are asked about general college education as well as specific education relative to each department and then compared to results from other universities. Due to the limited number of similar engineering programs in the U.S., the PFEN program is listed as “other” in the survey.

**Findings**
This outcome was rated better than the College average by the PFEN senior students.

**How did you use the findings for improvement?**