# Software Engineering Program Educational Objectives

The educational objectives of the Penn State Behrend Software Engineering Program are to produce graduates who, within three years after graduation, are able to:

A. Be employed in industry, government, or entrepreneurial endeavors to demonstrate professional advancement through significant technical achievements and expanded leadership responsibility;

B. Demonstrate the ability to work effectively as a team member and/or leader in an ever-changing professional environment; and

C. Progress through advanced degree or certificate programs in computing, science, engineering, business, and other professionally related fields.  
  
Software Engineering Outcomes

Graduates of the program are expected to demonstrate:

1. an ability to apply knowledge of mathematics, science, and engineering.
2. an ability to design and conduct experiments, as well as to analyze and interpret data.
3. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
4. an ability to function on multi-disciplinary teams.
5. an ability to identify, formulate, and solve engineering problems.
6. an understanding of professional and ethical responsibility.
7. an ability to communicate effectively.
8. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
9. a recognition of the need for, and an ability to engage in, life-long learning.
10. a knowledge of contemporary issues.
11. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
12. q) the ability to analyze, design, verify, validate, implement, apply, and maintain software systems.
13. r) the ability to appropriately apply discrete mathematics, probability and statistics, and relevant topics in computer science and supporting disciplines to complex software systems.
14. s) the ability to work in one or more significant application domains.

According to ABET, “Program Educational Objectives are broad statements that describe the career and professional accomplishments that the program is preparing graduate to achieve. Student Outcomes are narrower statements that describe what students are to know and be able to do by the time of graduation.”

The Program Educational Objectives were established through the input from employers of our students, alumni, and industrial constitutes of the program. The achievement of Program Educational Objectives is assessed through the use of alumni and employer surveys, as well as employer focus groups. The Student Outcomes are assessed using a combination of the following instruments:

1. Direct assessment of Student work. Each year faculty members in the program assess graded examples of student work to determine the level of achievement. The examples of student work are linked directly the Student Outcomes.
2. Senior Exit Surveys. This assessment survey is completed by all graduating seniors in which they are asked to rate how well the Student Outcomes were achieved.
3. Internship Employer Surveys. This assessment survey is completed by supervisors of students who receive internship credit. Employers are asked to rate how well the Student Outcomes were achieved.
4. Senior Design Industrial Sponsor Surveys. This assessment survey is completed by supervisors of senior design projects to measure how well the outcomes of the senior design experience were achieved.
5. Fundamentals of Engineering Exam reports from the National Council of Examiners for Engineering and Surveying. This nationally administered exam provides a national benchmark for assessing achievement of the Student Outcomes.

The Student Outcomes are assessed annually and each academic program employs at least three of the measurement tools above. More detailed information for each program is available upon request.