Student Learning Outcomes with Performance Indicators

Student Outcome	Performance Indicators
1. an ability to identify, formulate, and solve engineering problems	• Problem statement shows understanding of the problem • Solution procedure and methods are defined. • Problem solution is appropriate and within reasonable constraints
2. an ability to apply knowledge of mathematics, science, and engineering	• Chooses a mathematical model of a system or process appropriate for required accuracy • Applies mathematical principles to achieve analytical or numerical solution to model equations • Examines approaches to solving an engineering problem in order to choose the more effective approach
3. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	• Selects appropriate techniques and tools for a specific engineering task and compares results with results from alternative tools or techniques • Uses computer-based and other resources effectively in assignments and projects
4. an ability to design and conduct experiments, as well as to analyze and interpret data	• Observes good lab practice and operates instrumentation with ease • Determines data that are appropriate to collect and selects appropriate equipment, protocols, etc. for measuring the appropriate variables to get required data • Uses appropriate tools to analyze data and verifies and validates experimental results including the use of statistics to account for possible experimental error
5. 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	• Produces a clear and unambiguous needs statement in a design project • Identifies constraints on the design problem, and establishes criteria for acceptability and desirability of solutions • Carries solution through to the most economic/desirable solution and justifies the approach
6. an ability to function on multi-disciplinary teams	• Recognizes participant roles in a team setting and fulfills appropriate roles to assure team success • Integrates input from all team members and makes decisions in relation to objective

Student Outcome	Performance Indicators
	criteria • Improves communication among teammates and asks for feedback and uses suggestions
7. an understanding of professional and ethical responsibility	• Knows code of ethics for the discipline • Able to evaluate the ethical dimensions of a problem in the discipline
8. an ability to communicate effectively, both orally and in writing	• Writing conforms to appropriate technical style format appropriate to the audience • Appropriate use of graphics • Mechanics and grammar are appropriate • Oral: Body language and clarity of speech enhances communication
9. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	• Evaluates conflicting/competing social values in order to make informed decisions about an engineering solution. • Evaluates and analyzes the economics of an engineering problem solution • Identifies the environmental and social issues involved in an engineering solution and incorporates that sensitivity into the design process
10. a recognition of the need for, and an ability to engage in life-long learning	• Expresses an awareness that education is continuous after graduation • Able to find information relevant to problem solution without guidance
11. a knowledge of contemporary issues	• Identifies the current critical issues confronting the discipline • Evaluates alternative engineering solutions or scenarios taking into consideration current issues
12. a willingness to assume leadership roles and responsibilities	• Expresses a willingness to take on leadership responsibility • Demonstrates the ability to monitor team progress and make suggestions when needed • Engages team members in problem solution

Source: From ABET, Self-Study for a fictitious institution