Figure 1 BS Engineering Program Assessment & Enhancement Process

- **University, School & Department Mission & Goals**
- **BS Program Objectives**
- **Outcomes & Performance Criteria**
- **Department Loop**
  - Evaluation
  - Assessment
- **Program Loop**
- **Course Loop**
  - Each Course: Learning Objectives, Outcomes
  - Course Journal
  - Undergraduate Surveys
  - Outcome Notebook
  - Capstone Course, Senior Project
  - Alumni and Employer Surveys
- **Entering Students**
- **Program Enhancement**
- **Advisory Board**
  - Industry
  - Students
  - Alumni
  - Faculty
- **BS Program**
- **Graduating Seniors**

The diagram illustrates the assessment and enhancement process for a BS Engineering program, involving various stakeholders and data collection methods.
The Computer Option curriculum provides a broad education in the fundamentals of Computer Engineering. Students may pursue a general program or may choose a specialization in areas such as Computer Hardware or Computer Software.

<table>
<thead>
<tr>
<th>Program Educational Objectives</th>
<th>Program Outcomes</th>
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<tbody>
<tr>
<td><strong>1. Engineering Competence</strong> - Graduates will be competent engineers with problem solving and</td>
<td>Outcome a: Have an ability to apply knowledge of mathematics, science and engineering.</td>
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<td>design skills, and the capability to apply mathematics and science to solve engineering problems.</td>
<td>Outcome b: Have an ability to design and conduct experiments, as well as to analyze and interpret data.</td>
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<td>Outcome c: Have an ability to design a system, component or process to meet desired needs.</td>
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<td>Outcome e: Have an ability to identify, formulate and solve engineering problems.</td>
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<td><strong>2. Foundation in modern technologies</strong> - Graduates will have extensive knowledge about current</td>
<td>Outcome k: Have an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.</td>
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<td>technologies.</td>
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<td><strong>3. Professional skills</strong> - Graduates will have strong communication skills, and the ability to</td>
<td>Outcome d: Have an ability to function on multi-disciplinary teams.</td>
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<td>work successfully in teams. They will be well prepared for work in industry.</td>
<td>Outcome g: Have an ability to communicate effectively.</td>
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<td>Outcome l: Have an ability to apply their engineering knowledge to solve industrial problems, and enhance industrial profitability</td>
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<td><strong>4. Creativity and drive for technical innovation</strong> - Graduates will be self-motivated,</td>
<td>Outcome i: Have recognition of the need for, and an ability to engage in life-long learning.</td>
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<td>creative people who promote technical innovation and have enthusiasm for life-long learning.</td>
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<td><strong>5. Well-rounded education</strong> – Graduates will have knowledge of contemporary issues, an</td>
<td>Outcome f: Have an understanding of professional and ethical responsibility.</td>
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<td>understanding of professional and ethical responsibility, and possess a general education</td>
<td>Outcome h: Have the broad education necessary to understand the impact of engineering solutions in a global/societal context.</td>
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<td>necessary to understand the impact of engineering solutions in a global and societal context.</td>
<td>Outcome j: Have knowledge of contemporary issues.</td>
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Table 2: Engineering Program Outcomes and Performance Criteria

**Outcome a: Graduates will have the ability to apply knowledge of mathematics, science, and engineering.** Specifically, students will be able to

1. Use concepts from science to solve engineering problems.
2. Formulate analytical models using the laws of physics.
3. Use appropriate mathematical tools to solve equations.

**Outcome b: Graduates will have the ability to design/conduct experiments and analyze/interpret data.** Specifically, students will be able to

1. Design an experiment, including determining the data to be collected, the range of parameter values, and the use of statistical analysis.
2. Conduct an experiment and compare experimental with predicted or expected results.
3. Prepare reports that present the data from an experiment, interpret the data/results, and draw conclusions and make recommendations.

**Outcome c: Graduates will have the ability to design a system, component, or process to meet desired needs.** Specifically, students will be able to

1. Determine the necessary constraints and specifications.
2. Design components that meet specifications and constraints.
3. Design a system or process that meets specifications and constraints.

**Outcome d: Graduates will have the ability to function on multidisciplinary teams.** Specifically, students will be able to

1. Function as a team leader and/or team member in laboratory and problem-solving activities.
2. Function as a team leader and/or member in a senior design project.
3. Effectively participate in team-based oral and written reporting activities.

**Outcome e: Graduates will have the ability to identify applicable theories, and formulate and solve engineering problems.** Specifically, students will be able to

1. Demonstrate an ability to formulate engineering problems, to recognize the relevant signals/parameters, and to identify the governing theories and principles.
2. Create sketches, figures, flow-charts, and free-body diagrams.
3. Show understanding of the applicable theories and principles by demonstrating the use of relevant formulae and relationships.

**Outcome f: Graduates will understand professional and ethical responsibility.** Specifically, students will be able to

1. Demonstrate knowledge of safety factors in the design process.
2. Demonstrate knowledge of professional code of ethics.
3. Evaluate the ethical issues of an engineering problem.
Outcome g: Graduates will have the ability to communicate effectively. Specifically, students will be able to

1. Develop and present effective oral presentations that integrate appropriate visuals.
2. Write documents that are well organized, properly formatted, and clear.
3. Convey technical information through the use of data plots, graphs, calculations, drawings, and equations.
4. Communicate effectively with team members.

Outcome h: Graduates will have the broad education necessary to understand the impact of engineering solutions in a global/social context. Specifically students will be able to

1. Demonstrate knowledge of the impact of the products on society and the environment, including both production, and use.
2. Demonstrate an understanding of the impact of engineering decisions on society and the environment.

Outcome i: Graduates will recognize the need, to engage in life-long learning. Specifically, students will be able to

1. Investigate and gather information on a given engineering issue.
2. Recognize the need for continuing education, and participation in professional societies and meetings.

Outcome j: Graduates will have knowledge of contemporary issues. Specifically, students will be able to

1. Identify several contemporary issues.
2. Investigate, gather, and analyze information related to contemporary issues.
3. Describe the impact of social, environmental, legal, and other contemporary issues on engineering activities.

Outcome k: Graduates will have an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice. Specifically, students will be able to

1. Use libraries, the internet, and other sources to search for information necessary for engineering projects.
2. Use computer programs in analysis, simulation, and design of systems and components.
3. Use modern instrumentation to conduct experiments on components and systems.

Outcome l: Graduate will have the ability to apply their engineering knowledge and experience to solve industrial problems, and to enhance industrial profitability. Specifically, students will be able to

1. Work in cross-discipline teams.
2. Plan and execute projects, and prepare the necessary oral and written reports.
3. Identify engineering solutions within time and budget constraints.