

A Student's Guide to Accreditation

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This document has been prepared to assist Auburn University Chemical Engineering students in understanding the process of accreditation and its importance in their engineering careers. Some of this material has been adapted from other sources.

What Is Accreditation?

In the United States, accreditation is used to assure quality in educational institutions and programs. Accreditation is a voluntary, non-governmental process of peer review. It requires an educational institution or program to meet certain, defined standards or criteria. Accreditation is sometimes confused with certification. In general, institutions and programs are accredited, and individuals are certified.

There are two types of accreditation -- institutional and specialized. **Institutional accreditors**, such as those referred to as "regional" accreditors, examine the college or university as a whole educational institution. Auburn University is accredited by the Southern Association of Colleges and Schools (SACS).

Specialized accreditors evaluate specific educational programs. **Professional accreditors**, such as those for medicine, law, architecture and engineering, fall into this category. The Accreditation Board for Engineering and Technology (ABET) is a professional accrediting organization that accredits programs, not institutions.

Accreditation serves to notify:

- ✚ Parents and prospective students that a program has met minimum standards;
- ✚ Faculty, deans and administrators of a program's strengths and weaknesses and of ways to improve the program;
- ✚ Employers that graduates are prepared to begin professional practice;
- ✚ Taxpayers that their funds are spent well; and
- ✚ The public that graduates are aware of public health and safety considerations.

State licensing boards and certification programs may require graduation from an ABET-accredited program as the first step in the registration or certification process for professional practice. In some instances, ABET accreditation may permit students to receive federal funds in the form of scholarships, loans and grants.

The Importance of Accreditation

The importance of accreditation goes far beyond the quality of a student's educational program. In the U.S., many states require licensure of engineers for professional practice. State licensing boards view graduation from an ABET-accredited engineering program as the first step in the licensure process. Along with work experience, the state board for engineering registration also requires passing a series of tests on professional knowledge. Graduation from an ABET-accredited program is often required of engineers who have studied in the U.S. and plan to practice back in their home countries.

To an even greater degree, accreditation, and all of the professional benefits that accompany it, are an integral part of what industry in the U.S. seeks in young engineers. Employers, as well as ABET, recognize that well-educated students become valuable employees.

Today's engineering graduates face a new era in the profession of engineering. Engineers are now faced with issues of community and infrastructure development at a time of increasing technological advancement. With this shift comes an even greater need for young engineers who work well in a team environment, address the needs of society at large and take into consideration the political, economic and social implications of their work. This has become not only the challenge of the profession, but engineering education as well.

AICHE Criteria for Chemical Engineering Programs

Graduates must have demonstrated thorough grounding in chemistry and a working knowledge of advanced chemistry such as organic, inorganic, physical, analytical, materials chemistry, or biochemistry, selected as appropriate to the goals of the program; working knowledge, including safety and environmental aspects, of material and energy balances applied to chemical processes; thermodynamics of physical and chemical equilibria; heat, mass, and momentum transfer; chemical reaction engineering; continuous and stage-wise separation operations; process dynamics and control; process design; and appropriate modern experimental and computing techniques.

(Submitted by the American Institute of Chemical Engineers) reprinted from ABET Organization

ABET EC2000 Criteria for Engineering Programs

The faculty of the chemical engineering program are committed to sharing with the students the responsibility of learning and to providing a vigorous academic environment that encourages active learning and high quality student performance. The curriculum provides a thorough base of mathematics, physical science, engineering science, laboratory experience, and design experience which prepares students to apply chemical engineering principles to a variety of contemporary problems. In addition, the curriculum provides the general education necessary to identify the impact of engineering decisions in the broader societal context. This chemical engineering program integrates the knowledge and skills acquired in a rigorous set of courses, the extracurricular experiences, and the faculty expertise and scholarship needed to enable the graduates of the program to:

-  To develop an ability to apply knowledge of mathematics, science, and engineering.
-  To develop an ability to design and conduct experiments, analyze and interpret data.
-  To develop an ability to design a system, component, or process to meet desired needs.
-  To develop an ability to function on multidisciplinary teams.
-  To develop an ability to identify, formulate, and solve engineering problems.
-  To develop an understanding of professional and ethical responsibility.
-  To develop an ability to communicate effectively.
-  To develop the broad education necessary to understand the impact of engineering solutions in a global societal context.
-  To develop an ability to engage in life-long learning.
-  To develop a knowledge of contemporary issues.

 To develop an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Engineering programs accredited by ABET prepare students for a profession in which a knowledge of mathematical and natural sciences gained by study and practice is applied to the materials and forces of nature to benefit mankind.

Accreditation is a process of external review in which an educational institution and its educational programs are evaluated against a set of criteria. Most important to the ABET accreditation program is the fact that the profession determines the required criteria. This allows an accredited program to truly meet the demands of today's engineering profession, ultimately preparing students for greater success.

The ABET Accreditation Process

In the U.S. institutions choose which level of a program will be considered for accreditation. Most often, the institution selects its engineering programs at the baccalaureate level for accreditation review. The actual accreditation process examines the program's students, curriculum, faculty, administration, facilities and institutional support. This information is gathered by the program as part of the self-study process. This is followed by a campus visit during which the program is reviewed against its self-study and the established criteria. The information gathered from the self-study and campus evaluation report then become the determining factors for accreditation. More importantly, this self-study and evaluation report can be used to improve a program's delivery of engineering knowledge in the future.

Programs either receive accreditation or are denied accreditation. Accreditation does not provide a ranking of educational programs. ABET accreditation is for a maximum of six years, after which a program must again be reviewed.

The U.S. Department of Education recognizes ABET for the type of specialized accreditation it provides. ABET seeks recognition by the Department of Education voluntarily, not as a requirement. The U.S. Department of Education also provides students with information on the various types of recognized accreditation and the organizations responsible for different types of accreditation. For more information on this and other educational issues, visit the web site for the U.S. Department of Education at www.ed.gov or telephone 1-800-USA-LEARN. The Council for Higher Education Accreditation (CHEA) also recognizes ABET for its accreditation of engineering, engineering technology and engineering-related programs. The CHEA web site can be accessed at www.chea.org or telephone (202) 955-6126.

ABET accreditation signifies that these programs have met specific criteria that is determined by engineering professionals working in industry and education. Accreditation then becomes a tool students can use to determine a program's responsiveness to the needs of the profession. It is with this assurance that students can make well-informed decisions when choosing to pursue an engineering degree in the U.S.

Auburn University Chemical Engineering (AUCHEN) Accreditation

 The Department of Chemical Engineering (BS) has been continuously accredited since 1950.



The next General Review of the program will be made during 2004-05.

AUCHEN Mission Statement

Approved by CHEN Faculty: October 4, 2002

The Auburn University Department of Chemical Engineering prepares its undergraduate and graduate students, through high quality educational programs, to professionally and ethically practice engineering in a competitive global environment.

We provide our chemical engineering graduates with the tools, skills and competencies necessary to understand and apply today's technologies and become leaders in developing and deploying tomorrow's technologies.

The Department is expanding scientific and engineering knowledge through innovative research and creative partnerships involving academia, industry, and government.

Further, we actively develop outreach activities to assist individuals and organizations to find solutions to engineering problems through education, consulting activities, and practical research.

AUCHEN Program Objectives

Approved by CHEN Faculty: October 4, 2002

The program education objectives of the Auburn University Department of Chemical Engineering program are:

1. Develop within our graduates the technical proficiency needed for the professional practice of chemical engineering.
2. Develop within our graduates the ability to communicate effectively.
3. Instill within our graduates a commitment towards lifelong scientific inquiry, learning and creativity.
4. Foster within our graduates a commitment to protect the public interest, health, safety, and environment in the practice of the chemical engineering profession.
5. Foster within our graduates an understanding of the need to maintain the highest ethical and professional standards.

AUCHEN Program Educational Outcomes

Approved by CHEN Faculty: October 4, 2002

The program educational outcomes of the Auburn University Department of Chemical Engineering program are:

1. Our graduates will be able to apply mathematics, science, and engineering principles to solve chemical engineering problems. Although there will be an emphasis on chemical engineering principles, proficiency is also required in various general engineering and science areas as well. **Fundamentals** (3a)
2. Our graduates will be able to identify, formulate, and solve a range of chemical engineering problems systematically employing the skills of critical thinking and creative problem solving. **Analysis** (3e)
3. Our graduates will be able to design and conduct experiments, as well as analyze data, interpret and apply results to chemical systems and processes. **Analysis** (3b)
4. Our graduates will be able to utilize the techniques, skills, and modern computational tools necessary for contemporary chemical engineering practice. This includes a proficiency in the use of computer hardware and software packages. **Analysis** (3b, 3e, 3k)
5. Our graduates will be able to design a system, component, or process to meet desired technical, economic, safety, and environmental criteria. They will be able to perform design calculations from the conceptual stage to full-scale plant design, and to conduct an economic evaluation of the process. **Design** (3c, 3k)
6. Our graduates will understand and appreciate the need for professional integrity and ethical decision making in the professional practice of chemical engineering. **Ethics, Safety, Society & Environment** (3f, 3h, 3j)
7. Our graduates will demonstrate an understanding of contemporary issues encountered in the professional practice of chemical engineering including business practices, environmental, health, and safety issues and other public interests. Our graduates will be aware of the wide reaching effects that engineering decisions have on society, our global community and our natural environment. **Ethics, Safety, Society & Environment** (3f, 3h)
8. Our graduates will demonstrate proficiency in written communications. **Work Skills** (3g)
9. Our graduates will demonstrate proficiency in oral communications. **Work Skills** (3g)
10. Our graduates will be able to function successfully as a member of a multi-disciplinary team. They will be aware of leadership and group dynamics issues and exhibit a level of cooperation that allows for team productivity. **Work Skills** (3d, 3g)
11. Our graduates will appreciate the need for and engage in life-long learning to maintain and enhance the professional practice of chemical engineering. **Work Skills** (3i)

More detailed information about the department's accreditation process can be found at:

<http://eng.auburn.edu/programs/chen/programs/accreditation/index.html>