

New Chemical Engineering Accreditation Criteria to Debut in 2007

The increasing impact of biology within chemical engineering has been evident over the past several decades within the chemical engineering community. As a result, during the past several years, there have been several chemical engineering departments who have changed their department name to reflect the increasing role of biology within their chemical engineering curriculum. As more programs changed their name to “Chemical and BioX Engineering”, it became apparent that the ABET Program Criteria needed to be changed to ensure that accreditation processes were inclusive of the increased emphasis on biology within chemical engineering.

Within AIChE, the Education and Accreditation Committee (E&A) is responsible for overseeing all aspects of the accreditation process. This includes periodically reviewing the Chemical Engineering criteria, assigning and training AIChE members to serve as program evaluators, ensuring consistency in the ABET evaluation process for chemical engineering programs, and nomination of leaders in the profession to sit on the ABET Engineering Accreditation Commission (EAC).

In 2003, the AIChE E&A committee began to examine the Chemical Engineering criteria to consider modifications to include greater biological program content which had in turn resulted in the changing of departmental names. It also took this opportunity to reexamine the level of detail and prescription in the existing criteria. After significant discussion, a new set of program criteria was proposed by the E&A Committee in 2005, and was approved by the EAC for a one-year open comment period. The criteria underwent final approval by the EAC and ABET board in 2006, and will be used for any ABET accredited program visited during or after the fall of 2007.

The approved criteria are:

PROGRAM CRITERIA FOR CHEMICAL, BIOCHEMICAL, BIOMOLECULAR, AND SIMILARLY NAMED ENGINEERING PROGRAMS

Lead Society: American Institute of Chemical Engineers

These program criteria apply to engineering programs that include “chemical”, “biochemical”, “biomolecular”, and similar modifiers in their titles.

Curriculum

The program must demonstrate that graduates have: thorough grounding in the basic sciences including chemistry, physics, and biology appropriate to the objectives of the

program; and sufficient knowledge in the application of these basic sciences to enable graduates to design, analyze, and control physical, chemical, and biological processes consistent with the program educational objectives.

The new criteria are much less prescriptive than the old criteria, and are much more inclusive of the role of biology in the chemical engineering curriculum. The reduction in the recitation of specific areas of competence required of graduates such as stoichiometry, chemical thermodynamics, transport, reaction kinetics, and separations is consistent with the recent ABET trend toward flexible individual program-defined educational objectives. The broadness of the criteria will allow departments to define their programs and more closely tailor their coursework for example toward a particular subpart of the discipline or toward meeting the needs of regional industry or specialized advanced study.

On the other hand, a significant consequence of the new criteria is the implication that each program must now develop and publish explicit and detailed educational program objectives that they define for each of their graduates and against which they will provide evidence of student achievement. These objectives will be used to differentiate the goals and aspirations and scope of each program from all others. Each program will now become responsible for the breadth and depth of training their chemical, biochemical, and biomolecular engineering graduates possess.

Inaugural Biological Engineering Criteria also to Debut

Previously, engineering programs with "biological and similar modifiers" in their title fell under agricultural engineering program criteria. However, with the increasing appreciation of the importance of biology within many engineering disciplines, ABET put together a team including representatives from AIChE to develop new criteria specifically for biological engineering. These criteria also underwent final approval by the EAC and ABET board, and will be used for any ABET accredited biological engineering program visited during or after the fall of 2007.

For interested departments, the approved biological engineering criteria are:

PROGRAM CRITERIA FOR BIOLOGICAL AND SIMILARLY NAMED ENGINEERING PROGRAMS

Lead Society: American Society of Agricultural and Biological Engineers

Cooperating Societies: American Academy of Environmental Engineers,

American Institute of Chemical Engineers, American Society of Civil Engineers,
American Society of Mechanical Engineers, Biomedical Engineering Society,
CSAB, Institute of Electrical and Electronics Engineers,
Institute of Industrial Engineers, Minerals, Metals, and Materials Society,
National Institute of Ceramic Engineers

These program criteria apply to engineering programs including “biological,” “biological systems,” and similar modifiers in their titles with the exception of bioengineering and biomedical engineering programs.

1. Curriculum

Programs must demonstrate that graduates have proficiency in mathematics through differential equations, a thorough grounding in chemistry and biology and a working knowledge of advanced biological sciences consistent with the program educational objectives. Competence must be demonstrated in the application of engineering to biological systems.

2. Faculty

The program shall demonstrate that those faculty members teaching courses that are primarily design in content are qualified to teach the subject matter by virtue of education and experience or professional licensure.

Similar to the new chemical engineering program criteria, the new biological engineering criteria avoid prescription and are tied instead to explicit detailed program educational objectives. Although ASABE is the lead society for the new biological engineering criteria, it is expected that program evaluators will be drawn from all of the cooperating societies depending on the precise objectives for each specific program.

If you have questions or comments about the new criteria, please contact Jeff Sirola, E&A Committee Chair at sirola@eastman.com.