

The Evolution of the ACS Approval Process: Moving Beyond the 2008 Guidelines

Schedule:

Introductory Remarks (5 minutes)

[Infrastructure Requirements of the ACS Guidelines \(20 minutes\)](#)

Presenters: Cynthia K. Larive and Laura L. Kosbar

The infrastructure requirements of the 2008 Guidelines provide a foundation for program excellence. Faculty and instructional staff are the main drivers of undergraduate programs therefore contact hours are limited to 15 hours per week, with some flexibility for averaging. A minimum of 4 faculty members are required with at least 3/4ths holding PhDs. The 2008 Guidelines require that programs maintain a suite of modern instruments (including a functioning NMR) and specialized laboratory apparatus for student use, as well as providing students and faculty access to *Chemical Abstracts* and at least 14 current journals.

The past five years have witnessed rapid changes in the staffing of many chemistry programs, with increases in the numbers of temporary and non-tenure track instructors. Electronic access to chemical information is changing rapidly and modes of interaction with instrumentation, including remote access, could allow other paradigms for chemistry instruction. Updated guidelines may need to address these changes.

Discussion of infrastructure needed for an approved program (30 minutes)

This session will provide an opportunity for the attendees at this symposium to engage in a conversation about infrastructure requirements for approved programs. The discussion will focus on faculty and technology. Topics of the discussion will include appropriate maxima for teaching loads for both tenure-track faculty and other individuals who are involved in course delivery. We are also interested in the balance between faculty and instructional staff in course delivery. We will explore how the revisions to the Guidelines should reflect changes in information resources and their modes of delivery as well as how changes in technology affect the ways in which students work with instrumentation.

Break (10 minutes)

[The development of student skills and the role of research in the undergraduate curriculum: Implications for the ACS Guidelines \(20 minutes\)](#)

Presenters: Joel I. Shulman and Edgar A. Arriaga

While formal coursework provides students with education in chemical concepts and training in laboratory practices, students need to learn more than course content alone to be effective and productive scientists. They need to master a variety of skills that will allow them to become successful professionals, including problem solving, laboratory safety, use of the chemical literature, oral and written communication, team building, and ethical behavior. These skills can be imparted and assessed throughout the chemistry curriculum. Undergraduate research is an important experience that reinforces development of these skills while at the same time providing students the opportunity to integrate concepts learned in class into the broader context of a research question. The treatment of student-skill development and undergraduate research in the revised CPT Guidelines will be discussed.

Discussion of Skills required for a Certified Major (30 minutes)

The importance of skill development in undergraduate programs is becoming increasingly evident. During this session we will focus on the range of skills certified majors should gain by the time they graduate, how students can obtain these skills, and how the Committee on Professional Training can assess the effectiveness of programs to develop these skills in their students. We will also consider the role of undergraduate research and how it can be used to help develop student skills. This session will consist of both small group discussions as well as discussion in the larger group.

Break (10 minutes)

[Undergraduate curriculum and the ACS Guidelines \(20 minutes\)](#)

Presenters: Clark R. Landis and Anne B. McCoy

A central feature of the undergraduate experience is the courses that students are required to take. With the 2008 Guidelines, the course requirements for certified majors were made more flexible. Specifically, students have foundation level experiences in each of the five sub-disciplines of chemistry (analytical, biochemistry, inorganic, organic and physical) as well as four in-depth courses. In addition to the lecture courses, students should have at least 400 hours of laboratory, which covers at least four of the five sub-disciplines of chemistry. Further, approved programs need to teach the foundation courses in the five sub-disciplines, and offer four in-depth courses annually. In this talk, we will review the current requirements, as well as discuss areas where changes may be introduced during the revision of the guidelines that is presently underway. We will also describe various approaches for introducing areas of chemistry that span multiple sub-disciplines or which represent evolving areas in chemistry.

Discussion of the curriculum for the certified major (30 minutes)

During this session we will conduct a discussion of topics related to the curriculum a certified major must complete. In the 2008 Guidelines, considerable flexibility was introduced into the curriculum. Part of the motivation for the flexibility is to allow programs to include subjects that are appropriate for the students they are teaching. There must always be a balance between flexibility and ensuring students have an appropriate exposure to a broad range of topics that don't naturally fall into the five sub-disciplines of analytical, biochemistry, inorganic, organic, and physical chemistry. Such topics include, but are not limited to, green chemistry, polymer chemistry or material science. Much of the discussion will focus on these issues. In addition, the Guidelines currently stipulate that programs must teach foundation courses annually and must teach a minimum number of in-depth courses each year. We will discuss how this requirement affects programs, particularly when small-enrollment courses are involved.

General discussion (30 minutes)