Degree Tracks Supplement

Introduction

Degree tracks offer departments the opportunity to create unique student experiences through thoughtful selection of course requirements. For an ACS-certified degree, the Guidelines describe a degree track as a “specialized, faculty-designed curriculum meeting the foundation, in-depth, and laboratory requirements” (Section 5.8). Each student completing these basic curriculum requirements and appropriate cognate course work in an ACS-approved program becomes eligible for certification by the department chair. While a degree track can retain the broadly based exposure to all areas of chemistry that has traditionally been the curriculum for a certified major, a department can also define specialized degree tracks that take advantage of faculty and local expertise and match departmental and institutional missions.

The curriculum for each ACS-certified degree track must include foundation chemistry and cognate course work along with department-specified, in-depth courses and other requirements. The language used to describe the sets of courses or experiences within each degree track should reflect that used within the college or university. Consequently, the degree tracks may be described locally as *majors* or *concentrations* and the requirements for each should be included in the college catalogue. The collection of course work and experiences required for a degree track must provide students a coherent experience in that area. Programs should be able to provide a rationale for each degree track and its requirements.

It should be emphasized that ACS, through CPT, evaluates and approves the overall chemistry program of a department and not specific degree tracks. It is essential that each certifiable degree track meet the general requirements of a certified degree – the equivalent of one foundation course in each of the five subdisciplines of chemistry, four in-depth courses, and 400 hours of laboratory instruction beyond the introductory chemistry laboratory. In addition, laboratory course work must cover at least four of the foundation areas. CPT suggests that departments use the following or similar language in describing their program and certified degrees. "The chemistry program is approved by the American Chemistry Society (ACS). Students completing a baccalaureate degree that meets the ACS Guidelines will receive an 'ACS-certified degree'. The following degree tracks (majors, concentrations) include the course work and experience necessary to satisfy requirements for ACS certification." For example, if a department designs a biochemistry degree track, a student completing this degree track could say that she was awarded an "ACS-certified chemistry degree with a biochemistry emphasis (or concentration)."

Modes and Examples

Degree tracks may focus on providing a broad overview of chemistry, a specific chemistry subdiscipline, or a chemistry-related multidisciplinary area. For a *chemistry* degree track, a department might require the second semesters of organic and physical chemistry along with one or two additional in-depth electives and a research experience. Undergraduate research can be a valuable component of any degree track, and up to four credit hours of undergraduate research can counted as in-depth course work. Specialized *subdisciplinary* chemistry tracks provide greater in-depth study in a particular focus area. For example, in a department with strong faculty and student interest in synthesis, an *organic synthesis* track might include the second semester of organic chemistry, an advanced synthesis course, a course in spectroscopic characterization, and a laboratory-based research project. In a department with strong expertise in polymer chemistry, a *polymer chemistry* track could require the second semesters of organic and physical chemistry, additional in-depth polymer chemistry courses, and polymer research.

C*ross-disciplinary* and *multidisciplinary* tracks provide a broader range of in-depth courses. An *environmental chemistry* degree track, for example, might require the second semester of organic chemistry, a course in the environmental chemistry of water and water pollution control, another appropriate in-depth elective, and a laboratory research project. All in-depth courses must have one or more foundation chemistry courses (not introductory chemistry) as a prerequisite. A department offering such an environmental chemistry track might also include additional required courses in environmental law and statistics that would not qualify as in-depth courses because of their limited chemistry content (i.e., they do not build on the chemistry foundation courses). Similarly, a multidisciplinary materials concentration might require courses in materials science or polymer engineering in addition to the required in-depth chemistry courses. A department could also offer a *biological chemistry* track that might be appropriate for pre-medical students. A *biological chemistry* track might include the second semester of organic chemistry, additional in-depth biochemistry and/or medicinal chemistry courses, and a laboratory research project. Courses in biology or biophysics might also be considered in-depth courses, provided they had appropriate chemistry prerequisite and sufficient chemistry content.

The examples given are not intended to be prescriptive. There are many effective ways to structure the curriculum. The overall goal for a department in designing a degree track is to provide a coherent program, based on the department's expertise and interests, that strengthens and develops the chemistry education of its students beyond the foundation course experience.

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