

ACS Guidelines for Chemistry in Two-Year College Programs

The following is an excerpt from the *ACS Guidelines for Chemistry in Two-Year College Programs*. American Chemical Society: Washington, DC. 2015.

The complete electronic version of the *ACS Guidelines for Chemistry in Two-Year College Programs* and additional information are available at www.acs.org/2YGuidelines.

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3. Faculty and Staff

Providing current and effective chemistry education requires an engaged and accomplished faculty. The chemistry faculty are responsible for defining the overall goals of the program (as appropriate), facilitating student learning of curriculum content, developing students' professional skills, and modernizing the curriculum as the discipline evolves. Therefore, mechanisms must be in place to maintain the professional competence of faculty members, to provide faculty development and mentoring, and to allow for regular feedback regarding faculty performance. Similar mechanisms are needed for instructional and support staff.

3.1 Faculty. The chemistry faculty should have the range of educational backgrounds, the expertise, and the commitment to provide a sustainable, robust, and engaging environment for student learning. Everyone who teaches chemistry courses that result in a grade on a college transcript from the institution, regardless of location or mode of delivery, is considered part of the chemistry faculty and must meet institutional standards.

The chemistry faculty should have the following attributes:

- The minimum academic preparation required of any chemistry faculty member is a master's degree in a discipline of chemistry. The ability to communicate an understanding and appreciation of chemistry to others is essential. Further academic training (a doctoral or second master's degree in a related field) is highly desirable, particularly if it stresses depth and breadth of knowledge in chemistry.
- Full-time, permanent faculty should be sufficient in number to teach the full range of courses on a regular basis, with the number of credit hours taught by permanent faculty exceeding 75% of the total chemistry offerings.
- The collective expertise of the faculty should reflect the breadth of the major areas of modern chemistry. If an institution has a mission that more narrowly defines its programs, the faculty expertise may reflect that focus.

The department's climate and institutional policies should foster the development of a faculty with a wide range of backgrounds and experiences who can serve as role models for student bodies that are diverse in gender, ethnicity, race, and disability status.

The ACS *Academic Professional Guidelines*,² which describe responsibilities of students, faculty, and administration, should be followed. The institution should also comply with the *1940 Statement of Principles on Academic Freedom and Tenure*.³

3.2 Adjunct, temporary, and part-time faculty. Qualified individuals outside the full-time, permanent faculty should only be used to provide specific expertise and/or accommodate temporary term-to-term fluctuations in enrollments. While use of adjunct faculty to provide insight into current workplace practices can be valuable, a dedicated core of chemical education experts (i.e., permanent faculty) is needed to provide stable, consistent, and robust chemistry education. Thus, excessive reliance on adjunct faculty is discouraged.

Any adjunct faculty should be given compensation and professional development opportunities equivalent to those of full-time, permanent faculty. Adjunct faculty should have access to facilities that support class preparation, confidential discussions, and other teaching activities. Adjunct faculty should have the opportunity to be integrated into college activities and be given consideration for permanent positions. Courses taught by adjunct faculty should be aligned, in curriculum and content, with those of full-time faculty. Student learning in courses taught by adjunct faculty should be evaluated to ensure it is comparable to that in courses taught by permanent faculty.

3.3 Teaching contact hours. Contact hours are defined as the actual time spent in the direct supervision of students in a classroom (face-to-face or online) or laboratory. Online activities that are developed as substitutes for classroom instruction should be assigned the same contact hour value as

² American Chemical Society. *Academic Professional Guidelines* [Online], 4th ed.; American Chemical Society: Washington, DC, 2008. <http://www.acs.org/content/acs/en/careers/career-services/ethics/academic-professional-guidelines.html> (accessed Sept 10, 2015)

³ American Association of University Professors. *1940 Statement of Principles on Academic Freedom and Tenure, in Policy Documents and Reports* 3; American Association of University Professors: Washington, DC, 1984. <http://www.aaup.org/report/1940-statement-principles-academic-freedom-and-tenure> (accessed Sept 10, 2015)

equivalent face-to-face experiences. Additionally, each laboratory contact hour should be assigned the same contact hour value as a classroom contact hour.

The total number of contact hours in classroom and laboratory instruction for faculty or instructional staff members *should not exceed 15 total hours per week*; an instructor should carry no more than 450 student contact hours⁴ per week. If necessary, teaching loads as high as 18 hours per week may be assigned, provided that the average teaching load for all chemistry faculty does not exceed 15 hours per week for the academic year, and that the higher teaching load is only in effect for one term in that academic year.

Teaching assignments that exceed this standard risk lowering the quality of chemistry education and the academic institution. Fifteen contact hours is an upper limit; a smaller number should be the normal teaching obligation. Faculty and instructional staff members in the most effective programs usually have substantially fewer contact hours, particularly when they supervise student research projects or assume administrative or support activities.

Faculty members, after fulfilling teaching obligations, must have adequate time for the following professional activities:

- Holding office hours to meet with students
- Fulfilling service responsibilities to the department, the campus, and the community
- Developing new courses and curriculum innovations
- Assessing and improving curriculum
- Keeping abreast of new developments in chemistry and new educational pedagogies
- Participating in professional activities, including conferences
- Engaging in scholarship in chemistry, chemistry education, and teaching effectiveness.

No faculty member should be responsible for more than 25 students in a laboratory at one time.⁵ Many laboratories require smaller numbers for

⁴ Student contact hours equal the number of individual students taught, multiplied by the number of hours spent with the students in classroom and lab.

⁵ American Chemical Society. *Safety in Academic Chemistry Laboratories*; Vol. 2, *Accident Prevention for Faculty and Administrators*, 7th ed.; American Chemical Society: Washington, DC; 2003.

safe and effective instruction (e.g., 20 students is the recommended maximum for an organic chemistry laboratory).

3.4 Professional development. Sound policies regarding salaries, duties, promotions, sabbatical leaves, and tenure are essential. Institutional policies and practices should provide opportunities and resources for scholarly activities that allow faculty and instructional staff members to stay current in their specialties and modern pedagogy in order to teach most effectively. Faculty members should also be encouraged to seek professional development opportunities through teaching and learning centers and program partners and to develop new pedagogical initiatives.

- Institutions should provide opportunities and adequate funding for renewal and professional development through sabbaticals, participation in professional meetings, and other professional activities. Institutions should provide resources to ensure program continuity during sabbaticals and other leaves. Faculty should use these opportunities to keep current in their fields, to advance their skills, and to make valuable connections with chemical professionals from industry and government.
- Excellent institutions offer mechanisms by which faculty members are mentored. Proper mentoring integrates each member of the instructional staff into the culture of his or her particular academic unit and institution, and into the chemistry profession, ensuring the stability and vitality of the program.
- Faculty should have opportunities for externships, job shadowing, and other workplace experiences with their program partners or other businesses. This is especially important in chemistry-based technology programs, as such experiences strengthen the faculty's knowledge and skill in preparing students for the workplace.

In addition to supporting scholarly activities, the institution should provide regular training in the areas of safety, technology, and assessment.

3.5 Support staff. A sustainable and robust program requires an adequate number of secretarial, administrative, and support personnel, along with technical staff to maintain chemical inventories and instrumentation, support laboratory functions, and assure regulatory and safety compliance. The number of support staff members should be sufficient to allow faculty to devote their time and effort to academic responsibilities and scholarly activities. One full-time laboratory technician for every four full-time or full-time-equivalent chemistry faculty members is recommended. Part-time and student help are not adequate substitutes for full-time laboratory technicians.

Two-year colleges must have a chemical hygiene officer with appropriate training and experience to develop, manage, and implement the chemical hygiene plan for the campus.⁶ Colleges may also have a dedicated safety position responsible specifically for the chemistry or science department, as appropriate. In order to ensure consistent implementation of safety policies, it is recommended that the duties of a chemical hygiene officer be assigned to a dedicated, full-time position, rather than added to the teaching duties of the faculty.

Many two-year colleges have an Environmental Health & Safety (EHS) department or committee that includes the chemical hygiene officer. The purpose of the EHS group is to manage the campus safety program, support consistent implementation of safety policies, maintain the chemical hygiene plan, and ensure all faculty, staff, and students have up-to-date safety training.

To foster the development of a safe environment and a safety-conscious culture, all technical staff members, including part-time and student help, should receive regular training in chemical safety protocols, proper use of equipment, and waste management.

⁶ Occupational exposure to hazardous chemicals in laboratories. *Occupational Safety and Health Standards*, Standard no. 1910.1450, 1990. https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10106 (accessed Sept 10, 2015)