8.2 Counselors and advisers. Academic counselors should be discipline-specific and provide current information with respect to the most efficient route for completing a certificate or associate's degree, or for transferring to a four-year program. Effective counseling includes discussion of:

- Course prerequisites and skills needed for program completion
- Transfer to higher education or entry into the workforce, as appropriate
- Completion of all terms of required sequential courses (such as the general chemistry sequence and the organic chemistry sequence, if appropriate)
- Mathematics and other science sequences

Career advisers provide guidance for a student's development, networking, confidence building, and career planning; effective advisers are knowledgeable about current and future chemistry-based employment opportunities. Both counselors and advisers should encourage students with strong interests and abilities in chemistry to continue their educations in the chemical sciences.

Two-year colleges should use discipline-specific counselors and advisers to promote familiarity with chemistry and chemistry-related programs and to facilitate articulation with four-year college programs and industry. Both advisers and counselors should communicate with two- and four-year college faculty and community employers to assist students in developing educational plans within the curriculum of the institution that will lead to successful academic transfer or to employment.

Counseling and advising may be the responsibility of college personnel or of faculty as part of their job descriptions. Faculty members serving as advisers or counselors should be compensated or given reassigned time.

9. Program Self-Evaluation and Assessment

Self-evaluation should be an ongoing process leading to continual improvement of a program. A transparent and reflective self-evaluation process that collects, considers, and acts on evidence helps produce prepared students, promote ongoing professional development and scholarly activities of faculty members, and strengthen the infrastructure that supports the educational mission of the program.
9.1 Program goals and objectives. Institutions must ensure that infrastructural support is consistent with the program goals and objectives. The chemistry faculty should implement a variety of assessment techniques and tools, providing the necessary data for making informed decisions at the classroom, course, and program levels. These decisions should lead to the implementation of practices that effectively address the needs of the students.

9.2 Student learning. Assessment of teaching and student learning should be an integral part of the institutional mandate. Programs should have established procedures to regularly assess and evaluate their effectiveness with respect to curriculum and pedagogy.¹² Institutional research offices often have access to aggregate student data on preparedness, advancement through programs, and subsequent performance at four-year institutions. These offices should provide opportunities to survey students during and after enrollment.

9.3 Innovations in instruction. Ongoing assessment and continuing instructional revision improves student learning and reinforces improvements in curriculum and pedagogy. When new courses and pedagogical initiatives are developed, their effectiveness and value should be assessed. Innovation and experimentation in the educational process, coupled with a strong assessment component, should preserve the vitality of chemistry education.

¹² Many institutions rely on the ACS Division of Chemical Education Examinations Institute (http://chemexams.chem.iastate.edu/) for assessment because it provides a wide variety of tests to assess student learning while providing national norms and statistics. Other assessment instruments may also be used. (accessed Sept 12, 2015)