

American Chemical Society



# Evolution of the ACS Guidelines for Program Approval and Student Certification: 2022 Preview

Scott Reid, Marquette University

# ACS Committee on Professional Training (CPT)



- Established as a standing committee of ACS in 1936
- Assigned responsibility for **properly accrediting institutions**
- Committee duties include
  - **Periodic reviews** of ~ 670 approved chemistry programs
  - **Developing surveys** to understand current trends in chemistry education and map longitudinal developments
  - **Working to keep the Guidelines for Bachelor Degree Programs in Chemistry** (last revised in 2015) **current** and continuing to challenge programs towards self-improvement

# Challenges in Guidelines Development

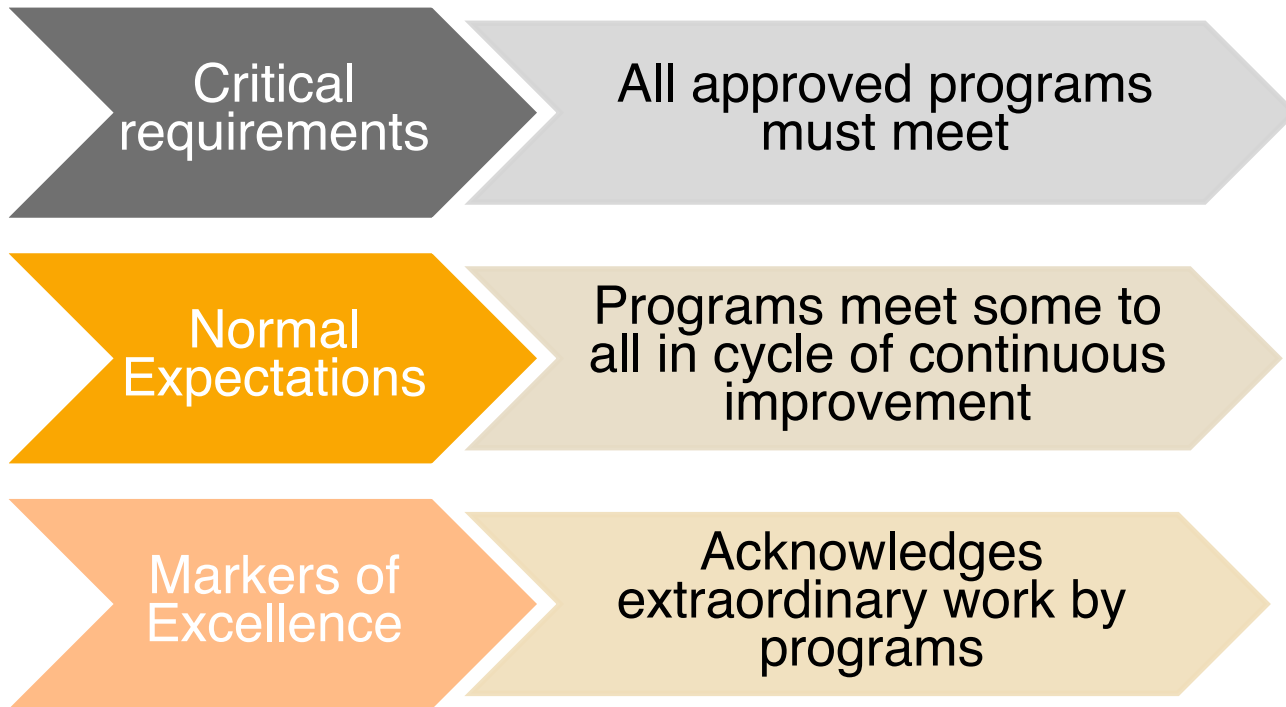


- **Large diversity in size, scope and mission of institutions** that offer Baccalaureate degrees in Chemistry and related fields
  - Range of institutions from R1 to PUI, with diverse missions
  - Faculty sizes from ~ 4-60
  - Degrees awarded from ca. 2/year to 250+/year
- Desire to be **inclusive** rather than exclusive in equitably administered process
- **Dynamic nature of chemistry** as a discipline, need to respond to emerging trends

# Goals of Current Revision

- **Baseline critical program requirements and increase transparency in expectations and evaluation**
  - “Musts”/”shoulds” language recast into new categories:
    - Critical Requirements/Normal Expectations/Markers of Excellence
- **Expand emphasis on student skill development in the classroom and laboratory**
  - Initially emphasized in 2008 guidelines
- Introduce formal requirement around **Diversity, Inclusion, Equity, and Respect (DEIR)**
- Increase focus on **Safety** with new stand-alone **Safety section**

# New Guidelines Structure



# Example of New Structure: Undergraduate Research (DRAFT)



- **Critical requirements for approval**
  - Research should be well-defined, apply and develop understanding of in-depth concepts, promote awareness of safety, be grounded in literature, and contribute new knowledge to the discipline.
  - In programs where research is required for certification, students must prepare a well-written, comprehensive, and well-documented research report that follows the institution's rubric
  - Student must prepare a written report in order for summer/off-campus work to count towards student certification
- **Normal Expectations**
  - Research is envisioned as a component of a publication in a peer-reviewed journal or technical report
  - Research progress would be presented at an institutional or local meeting.
- **Markers of Excellence**
  - Research contributions would result in a co-authorship of a peer-reviewed publication
  - Research would be presented at a regional or national chemistry meeting
  - A research project involving multiple semesters or years with students gaining increasing independence and scientific sophistication.

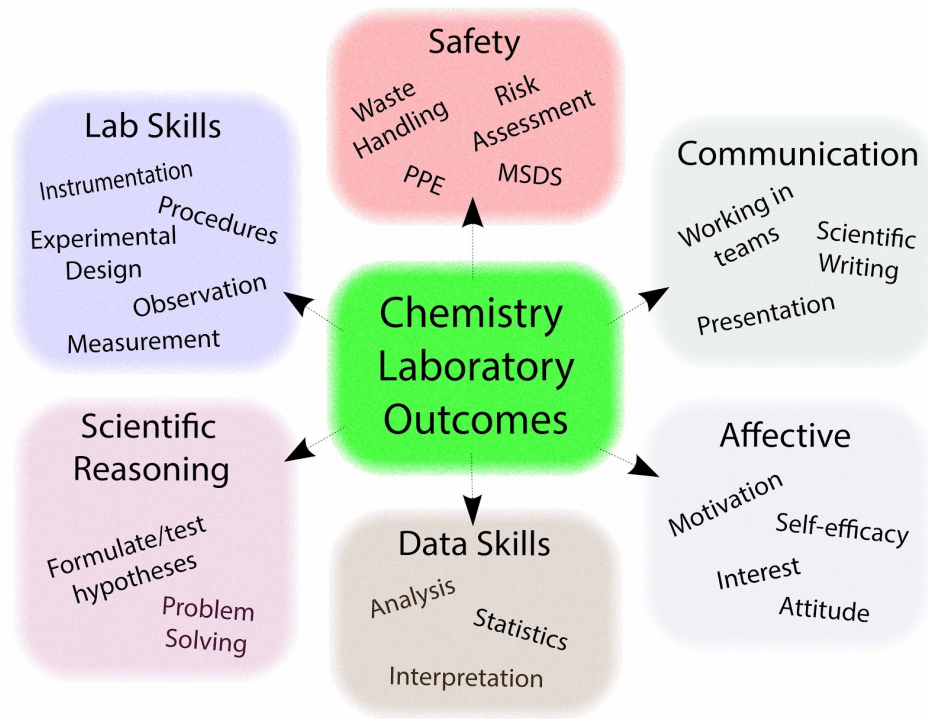
# Revisions: Student Skill Development



- Revised by subcommittee within CPT
- Separated into two sections: **technical** vs. **professional**
- **Technical Skills and Competencies** include:
  - **Data Analysis; Computational Skills; Laboratory Safe Practices; Green Chemistry and Sustainability; and Systems Thinking**
- **Professional Skills and Competencies** include:
  - **Communication Skills; Information Retrieval, Evaluation, and Management; Teamwork and Collaboration; Professional Conduct of Scientists**

# Student Skill Development in Laboratory

- Includes **practical skills** and **practice of science skills**, in addition to technical and professional skills and competencies
- **Practical skills** include practical hands-on and critical thinking skills
- **Practice of science skills** focus on use of the scientific method in the laboratory





# Guidelines for Advancing DEIR

- Developed by subcommittee within CPT, guidelines published in *J. Chem. Educ.* 2022, 99, 1, 393–401
- **DEIR section** addresses:
  - **DEIR experience and training**
  - **Recruitment and Retention of Faculty, Staff, Students**
  - **Retention of Chemistry Majors**
  - **Policies and Procedures**
  - **Reviewing, Revising, and Communicating Policies**

# Example: DEIR Policies and Procedures (DRAFT)



- **Critical Requirements**
  - Have institutional, or departmental policies to investigate and address issues of: Discrimination, Bias, (Micro)aggressions, Prejudice, Harassment
- **Normal Expectations**
  - Have procedures and tools for observing & documenting inclusive classroom practices.
  - Communicate and clearly articulate criteria for personnel whose evaluation include DEIR criteria
  - Track department demographics (faculty, staff, students)
  - Conduct or participate in departmental/institutional climate surveys..

# Example: DEIR Policies and Procedures



- **Markers of Excellence**
  - Make curricular goals related to DEIR available on a public forum. Include both
    - Evaluation of curriculum
    - Revision of curriculum
- Establish metrics for evaluating policies used to address issues of **discrimination bias**, **(micro)aggressions**, prejudice, and **harassment** in the working and learning environments.
- Communicate effective practices in faculty, staff, and student recruitment and retention
- Have a strategic plan to communicate about and advance access to learning environments, including laboratories, for students with different abilities.

# Guidelines Revision and YOU: Your feedback is crucial to this process!



- There are many ways to provide feedback to the committee
  - Watch for surveys from the OPT
  - Attend symposia and “Birds of a Feather” events at BCCE, where CPT is represented
  - CPT Open meetings are held on Sunday at every national ACS meeting, and CPT representatives are often present at regional meetings
  - CPT holds a luncheon for department chairs on Sunday at each national meeting
  - Contact us directly!

## Thanks to....

- OPT staff and current and former CPT colleagues
  - Michelle Brooks
  - Felicia Fullilove
  - Edgar Arriaga
  - Greg Caputo
  - Cora MacBeth
  - Barbara Reisner
  - Kerry Karukstis
  - Anne McCoy, Tom Wenzel, and many more...

# Questions???



[relationship.com.au](http://relationship.com.au)



ACS

Chemistry for Life<sup>®</sup>

American Chemical Society