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# Emerging Trends in the Two-Year College Landscape

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*SOCED Task Force on ACS Guidelines for Chemistry  
in Two-Year College Programs*

251<sup>st</sup> ACS National Meeting and Exposition  
March 13, 2016

## Overview

1. Dual enrollment
2. Distance learning
3. Alignment with four-year guidelines
4. Undergraduate research
5. Infrastructure requirements

## Dual Enrollment

- High school students taking college level classes and receiving credit at both institutions
- College responsible for quality control of the course
  - Instructor qualifications
  - Course structure and equivalence to regular on campus course

Lots of ways to do it—teach on-campus, teach at high school campus, teach at community center, use two-year college chemistry faculty, use other two-year college faculty, use high school teachers

Popular for engaging students and reducing tuition costs

Instructor must be qualified to teach at the community college

Syllabus, lab experience, exams and grading must be equivalent to regular on campus course to ensure that the credits will be transferable

## Distance Learning

- Fully online or hybrid courses
- % campuses offering transferable distance courses: 18.8%
- Requirements
  - Same content as in face-to-face course
  - Same skill development
  - **Hands-on** experiences
- Instructor and peer access
- Faculty contact hour credit should be equivalent to that of the corresponding classroom course
- More ideas: [www.acs.org/2YColleges](http://www.acs.org/2YColleges), click on "Emerging pedagogies"

Distance learning is also gaining popularity

Useful for isolated and/or working students

Commonly thought to be a way to reach more students with less work (Not true for a well-done course)

In the 2014 Two-Year College Chemistry Landscape survey, 18.8% of 346 responding campuses reported offering at least one distance ed chemistry course that was transferable to a four-year program.

ACS requires that online courses be as effective at teaching requisite skills and knowledge as their face-to-face equivalents.

Yield at least the same student skills development

If credit is given for labs, these must be hands-on; computer simulations can be used to supplement the lab experience, but cannot replace hands-on work.

Ability to use electronic balances, volumetric glassware, pH meters, spectrophotometers, and prepare solutions

Appropriate safety instruction and measures

## Alignment with Four Year Guidelines



- 2015 ACS *Guidelines and Evaluation Procedures for Bachelor's Degree Programs* curriculum change
- ACS-approved baccalaureate programs must address at least two of the following:
  - Synthetic polymers
  - Biological macromolecules
  - Supramolecular aggregates
  - Meso- or nano-scale materials
- No guidance on *how*

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So two-year college chemistry faculty must work with faculty at transfer institutions to ensure curricular alignment

The general chemistry requirements for the two- and four-year guidelines are aligned, but here's what the four-year guidelines say, just in case

## General Chemistry basic lab skills

Ability to use electronic balances, volumetric glassware, pH meters, spectrophotometers, and prepare solutions

Appropriate safety instruction and measures

Keeping a laboratory notebook

Data analysis

Report writing

## Undergraduate Research

- Offered at about  $\frac{1}{4}$  of two-year colleges
- Engagement/development for both faculty and students
- Models
  - Independent work
  - Group work
  - Course assignment
  - Collaboration with other two-year colleges
  - Collaboration with four-year institutions
- Helpful for transfer students
- More ideas: [www.acs.org/2YColleges](http://www.acs.org/2YColleges), click on "Research & internships"

In the 2014 Two-Year College Chemistry Landscape survey, 39 out of 148 responding campuses reported offering research opportunities.

In the 2013 Two-Year College Chemistry Landscape survey, 21.2% of 552 responding faculty reported doing research, and 15.0% more reported that support for research was available, even though they didn't do it.

In the revised Guidelines, we included extra guidance on structuring beneficial research programs. Effective research requires

**Defined topic with achievable goals**

**Access to chemical literature and equipment**

**Appropriate methodologies and safety practices**

**Supervision by experienced chemist**

Written report at conclusion

Can be carried out as a group project

Research experience helpful for  
transfer students

# Infrastructure Requirements



- Computing facilities and software for data acquisition and analysis
  - Including interactive simulation and computational chemistry
  - Scientific word processing and illustration capability
- Chemical information resources
  - Journals and databases, can be online or available through interlibrary loan
  - ACS open access options:  
<http://pubs.acs.org/page/4authors/authorchoice/index.html>

# Comments?



## Questions? Comments?



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**[www.acs.org/2YColleges](http://www.acs.org/2YColleges)**

## Task force members

- Susan Shih, Chair  
*Society Committee on Education (SOCED)*
- Ludivina Avila
- Pamela M. Clevenger  
*Division of Chemical Education (CHED)*
- Ron W. Darbeau  
*Committee on Professional Training (CPT)*
- Tamika T. Duplessis
- Amina K. El-Ashmawy  
*Two-Year College Advisory Board [now sunsetted]*
- Julie Ellefson-Kuehn  
*Committee on Chemistry in Two-Year Colleges (COCTYC)*
- Donna G. Friedman
- Mark Michalovic
- Armando M. Rivera-Figueroa  
*Committee on Minority Affairs (CMA)*
- Joan Sabourin  
*Member, 2014-2015*  
*Staff liaison, 2013-2014*

## More two-year information

- Strategies Promoting Success of Two-Year College Students

Mon, 8:30-12, Manchester Grand Hyatt,  
Promenade B

Tues, 8:30-11:40, Manchester Grand Hyatt,  
Promenade B

Thank You!

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March 2016