

# Introducing general chemistry students to academic safety culture through participatory case study development

Professors Gregory M. Ferrence<sup>1</sup> and Susan Schelble<sup>2</sup>

<sup>1</sup> Illinois State University, Department of Chemistry

Normal, IL 61790-4160, USA

[gferren@ilstu.edu](mailto:gferren@ilstu.edu)

<sup>2</sup> Metro State University of Denver, Department of Chemistry

Denver, CO 80217-3362, USA

[sschelbl@msudenver.edu](mailto:sschelbl@msudenver.edu)

# About ISU CHE 140

- General Chemistry I
  - First semester of two semester sequence
  - Three 50 min weekly lectures; one 270 weekly lab
  - Lab alternates weekly between *humidus* (wet) and *aridus* (cooperative learning) exercise
  - 500 to 600 students annually
- Distribution of majors
  - 21% – Biological Sciences
  - 10% – Biochemistry/Molecular Biology
  - 9% – Chemistry
  - 8% Computer science
  - 5% each – Physics, Exercise Science, Medical Lab Science, Environmental Science, Agriculture
  - 11% undeclared
  - Rest (16%) – Geology, Nursing, Athletic Training, Misc.

# Inspiration – Part 1

MEETINGS CAREERS MEMBERSHIP & NETWORKS EDUCATION ADVOCACY FUNDING & AWARDS NEW

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## ACS Committee on Ethics

### Mission

The Committee on Ethics promotes and supports high standards of ethical conduct and integrity in the community of chemistry and related disciplines for the benefit of science and society.

- About the Ethics Committee
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### Resources for ACS members

- ACS Ethics Resources available at 'Ethics CORE'
- Professional Ethics and Chemical Safety
- Case Studies for Chemistry Ethics Education

### Ethical Guidelines

- Ethical & Professional Guidelines
- Non-ACS Resources



Department of Chemistry

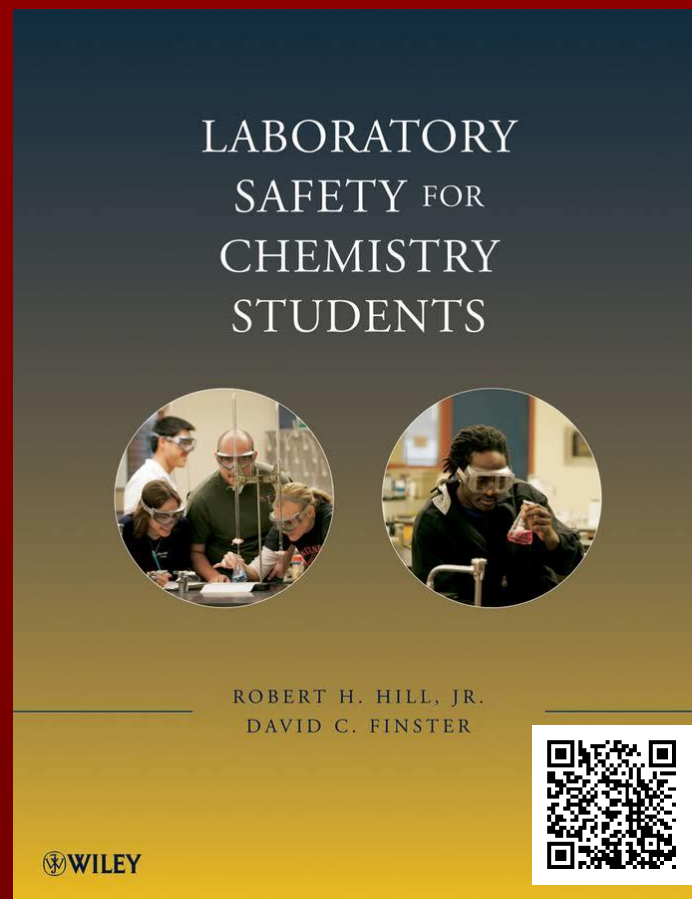
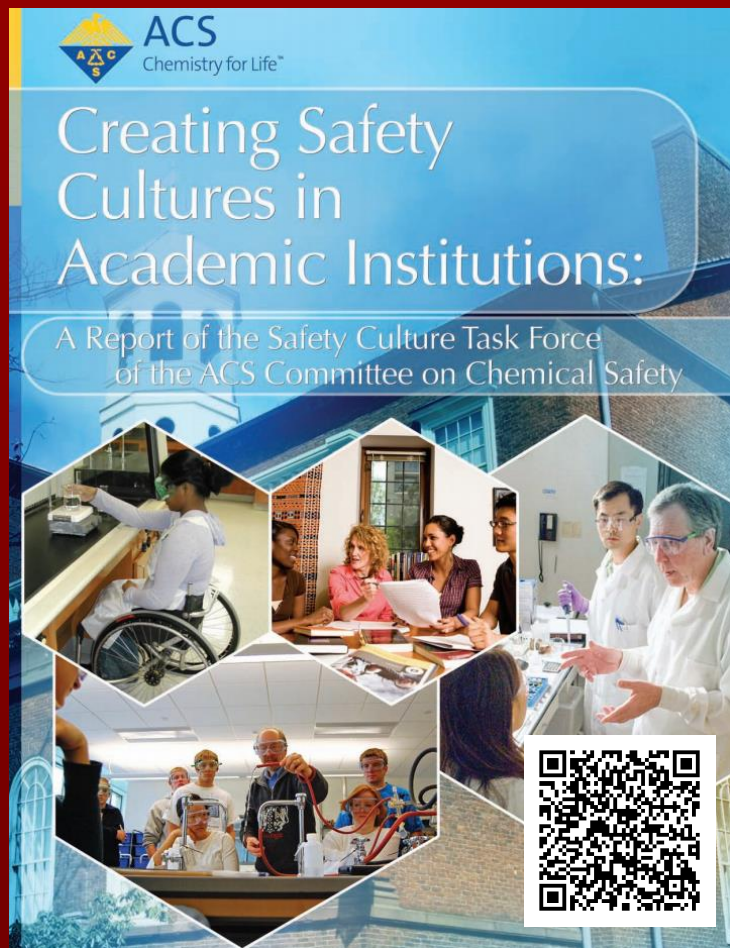
## Responsible Conduct of Research and Other Ethics/Professionalism Matters

A General Chemistry cooperative learning exercise  
Illinois State University, Department of Chemistry  
Normal, IL 61790, USA

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Prof. G. Ferrence [www.ferres.org](http://www.ferres.org)

# Inspiration – Part 2



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# Audience participation

- 1) Voting is by 'clickers' using your cell phone, tablet or laptop
- 2) We will use a web-tool called PollEverywhere;  
for more information see:  
<http://www.polleverywhere.com/>
- 3) If you can text, you can do this; just follow the onscreen instructions
- 4) Voting is anonymous



# Audience participation (cont.)

- 5) While some scenarios are designed to evoke strong opinions, there are many situations where there really is not any 'right' answer.
- 6) The process and discussion is very important to developing a mindset of safety.

## Ground Rules

PLAY NICE !!!!!

# System Test (let's practice)

- The command from the home-plate umpire to start a baseball game is.



Official Baseball Rules  
2015 Edition

OFFICIAL PLAYING RULES COMMITTEE



- 1. Play Ball
- 2. Play
- 3. Let's Roll
- 4. Go!
- 5. Git' er' done

## 5.00–PLAYING THE GAME

### 5.01 Starting the Game (“Play Ball!”)

- (a) (4.02 and 5.01) At the time set for beginning the game the players of the home team shall take their defensive positions, the first batter of the visiting team shall take his position in the batter's box, the umpire-in-chief shall call “Play,” and the game shall start.
- (b) (5.02) After the umpire calls “Play” the ball is alive and in play and remains alive and in play until for legal cause, or at the umpire's call of “Time” suspending play, the ball becomes dead.

# Ready, set...

- Please read the brief 'case' on the next slide.
- The moderator (Instructor) will advance from the 'case' to an anonymous poll and you will be given a change to participant[ate in the poll.
- Once the polls are tallied, the results will be posted and the class as a whole is to engage in a moderated discussion about the topic and the outcomes of the poll.
- Your enthusiastic participation is requested to make this work well.

# Gotta Run

- Greg, a CHE 140 student is performing a *humidus* exercise and really needs to leave lab early to make a critical appointment with his academic advisor. Bob has completed the lab exercise, but he lacks time to clean his glassware, so he puts the glassware away dirty. Sue, his lab partner suggests that it is not safe to put the glassware away dirty, particularly since the laboratory glassware is communal. Greg affirms it is no big deal since it is just dirty dishes.

# Who is right?

- 1. Sue, since the dirty glassware poses a safety threat to the next user.
- 2. Greg, appointments with advisors need to be kept, and a little dirty glassware in Gen Chem is no big deal.
- 3. It depends on what chemicals are left behind in the 'dirty' glassware.
- 4. This isn't a matter of safety; it is a matter of being rude and leaving a mess behind.

# If Greg were your lab partner, what option would you choose?

- 1. It's just dirty glassware, let Greg leave it behind.
- 2. You offer to clean Greg's glassware, so he makes his appointment on time.
- 3. You wait until Greg leaves, then quietly clean up after him.
- 4. You wait until Greg leaves, then you report his actions to the instructor.
- 3. Greg knows when lab meets. It is unacceptable for him to schedule a conflicting appointment. Obviously Greg needs to stay and clean up.

# Carry this conversation further.

- What are some good ways to handle this situation?
- What situations might arise where a student needs to leave lab early? Make a list on the board.
- What other safety issues might arise if a laboratory partner departs from lab early?

# Other case scenarios.

- Introducing GHS symbols
- Safe egress upon building alarm
- Failure to wear PPE while others in lab are still actively experimenting
- The distracted student
- The overflowing waste jar
- The contaminated calculator
- Water bottles (for drinking) in the laboratory
- The ever present frayed electrical cord
- Organic solvent fire

## Your turn

- In groups of four, design a short case study in the format just practiced.
- Today's Hand-in sheet is a 'story board' for your case. The four boxes are for up to four PowerPoint panels. Design a case using between two and four panels that would still look reasonable if displayed on screen.
- For the purpose of today's exercise, within each group you have permission to copy the final story boards to each of your hand-in sheets. (With attribution, of course.)

# Acknowledgements

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- ACS Committee on Chemical Safety (CCS)
- Pacifichem 2015
- Audience (you)