

Chemistry 343 - Syllabus

Prof. Jeff Yarger, Physical Chemistry Lab, Spring 2013

General Information:

January 5, 2013

Lecture: Mon. Recitation, Online (YouTube) – NO CLASS in PSH 151
Lab: Mon. 8:40 – 11:30 AM Laboratory Section, PSH 530 & 532
Mon. 2:40 – 5:30 PM Laboratory Section, PSH 530 & 532
Mon. 5:40 – 8:30 PM Laboratory Section, PSH 530 & 532
Tues. 8:40 – 11:30 AM Laboratory Section, PSH 530 & 532
Physical Sciences Building (PS), PS-H532 (lab),
PS-H530 (Computational Labs and Data Analysis),
PSB40 (Raman) and ISTB1 L2-63 (NMR)

Teachers: Lab Instructors: Dr. Jeff Yarger, ISTB1 481H
Jeff.Yarger@asu.edu
Phone: (480) 727-9824 (office)
Skype: jlyarger or (623) 565-9913 (best)

Teaching Assistants: Warner Weber, ISTB1 481CE,
warner.s.weber@gmail.com
Steve Davidowski, ISTB1 481CC,
sdavidow@asu.edu

Office hours: 1:30 PM – 2:30 PM, Mon, Tues or by appointment.
Office Hours will be held in PSH530 or ISTB1 474.

Web Site: <http://myasucourses.asu.edu>
All course material will be posted on Blackboard (CHM343 Blackboard)

Textbooks and required material

1. There is no required textbook. (Experiments in Physical Chemistry, by Garland & Shoemaker is the Optional Text)
2. Handouts and Background Material will be posted online.
3. A small bound laboratory notebook is required for recording data.
4. A lab coat and safety goggles are required when in any ASU chemistry laboratory.

Recitation

ASU CHM343 is a 'hybrid' course. This means that recitation material will be completely online and students will only be meeting for laboratory exercises. All recitation material will be posted online. Recitation will be used for general announcements, general laboratory information, and background introductions to each lab. Online recitation material and screencasts will be posted one day prior to the start of each laboratory class period.

Lab

Students will attend one laboratory section that meets for 3 hrs once every week. The lab times are listed above and there are four sections between Monday morning and Tuesday night.

Students will work in groups to complete four laboratory experiments. Two or three laboratory periods will be given to complete each of the four experiments. A laboratory experiment schedule will be posted on the course website.

While the experiments and data collected for each lab will be done in groups, all data analysis, computational experiments and reporting will be done individually. Experimental procedure and data must be recorded in a laboratory notebook and must be witnessed by an instructor or TA.

Reports

A laboratory report is required for each lab and must be turned in within 1 week of completing the experiment. Each report must be typed and submitted in the format of a **scientific journal** as discussed below. Every student will turn in his or her own laboratory report. A lab report will be penalized 10% every day it is late. There is a 10-page limit on all reports (no smaller than 10 pt fonts). However, a supplemental section is allowed (this is typical for most scientific journals). Please ensure that you make proper reference to any supplemental material included in your report. Students will be expected to turn in an electronic copy of each lab report using ASU blackboard (preferably in PDF format). A peer review process will be employed on several lab reports. Details will be discussed in recitation.

Written Lab Report Format (100 pts ea.):

Lab reports should be submitted in an ACS approved scientific journal format. A representative published journal article will be provided in class. All reports must be typed and should follow the standard double column format with embedded figures and tables, as found in a typical ACS scientific journal article. Reports should contain the following parts:

- **Title** – The title should be informative and should contain keywords that will allow another scientists to search in databases for your manuscript. For this class, you should also include the experiment number. (2 pts)
- **Authorship** – Your full name, email address and name of lab partner(s). (2 pts)
- **Abstract** – This should briefly and clearly describe the purpose of the experiment, the principle results and the major conclusions. The principle results are typically numerical values with the associated errors. (5 pts)
- **Introduction** – The introductions should state the purpose of the investigation. It should also include appropriate citations and should provide concise background and/or theory relevant to the experiment/lab. (5 pts)
- **Experimental** – A description of the chemicals, procedures and equipment used during the investigation. From this section, someone should be able to reproduce the experiments you performed in lab and/or using computational resources. Therefore, the simple evaluation of this section is ‘can you reproduce the experiments performed by the student’? (25 pts)
- **Results & Discussion** – Present the results of the experiment using tables and figures to help illustrate key points (15 pts). Include detailed figure captions for all tables and figures used in your report (5 pts). Discuss the results (5 pts) and compare with your expectations and other known literature results (5 pts). An analysis and discussion of error for the experiment should be included in this section (5 pts), however, often detailed examples of the error analysis statistics and calculations are provided as a supplemental section (5 pts). Any detailed calculations for the data analysis can also be provided in a supplemental section (5 pts). (45 pts Total)
- **Conclusion** – Briefly summarize your results and interpretation. (6 pts)
- **References** – List citations in a corresponding order to their appearance in the text of your lab report. References need to be provided so that someone reading the report could look up all the references and have adequate background material and information. (10 pts)

Makeup Labs: If you know you will miss a laboratory **and have an official University excuse** (from the Office of Student Affairs), you may schedule to makeup the laboratory experiment during any of the laboratory sections or during the last week of the semester.

Grades

To receive a grade in this class you must be registered on Blackboard and TurnItIn.com. All grades will be recorded in Blackboard and each student can view his or her individual laboratory scores. See the course web site for details. Each laboratory report is worth 100 pts for a total of 400 points. There will also be a final practical exam given at the end of the semester. This will cover practical data analysis and error analysis techniques learned throughout the course. Also, each lab report will have peer and self reviews required and will be used to assess lab reports.

Four Lab Reports (100 pts each)	400 pts
Peer and Self Review (100 pts)	100 pts
<u>Final Exam (100 pts)</u>	<u>100 pts</u>
Total	600 pts

The following percentages provide the breakdown of grades. Reports will be peer evaluated and points awarded for accurate and detailed self and peer evaluations.

A+ > 95%	C > 65%
A > 90%	D > 50%
A- > 88%	F < 50%
B+ > 86%	
B > 80%	
B- > 75%	

Academic Dishonesty

As college students you are expected to observe high standards of intellectual integrity and honesty. Plagiarism of the work of fellow students or authors on laboratory reports, or cheating on exams will result in an immediate dismissal from the class with a failing grade.

Laboratory Safety

Safety guidelines and rules will be posted on Blackboard. Students must read this form and return a signed and dated copy to the instructor and/or TA before he or she will be allowed to be in an ASU chemistry laboratory. No food, drink or cell phones are allowed in the chemistry laboratory (PSH532). Lab coats, lab goggles and close-toed shoes are required in all ASU chemistry laboratories.

Date	Tentative Laboratory Experiments & Schedule
1/14	Syllabus , Plotting Software, Computational Software & General Lab Intro. (PSH530)
1/28	Experiment 1 – NMR Diffusion in Liquids – Data and Error Analysis (PSH530)
2/4	Experiment 1 – NMR Diffusion in Liquids – NMR Instrument (ISTB1 L2-63)
2/11	Experiment 1 – NMR Diffusion in Liquids – Data and Error Analysis (PSH530)
2/18	Experiment 2 – Heats of Combustion – Bomb Calorimetry (PSH532)
2/25	Experiment 2 – Heats of Combustion – Computational Thermochemistry (PSH530)
3/4	Experiment 2 – Heats of Combustion – Data and Error Analysis (PSH530)
3/18	Experiment 3 – Equilibrium Constant - NMR and/or IR/Raman (ISTB1 L2-63)
3/25	Experiment 3 – Equilibrium Constant - Computational Chemistry (PSH530)
4/1	Experiment 3 – Equilibrium Constant – Data and Error Analysis (PSH530)
4/8	Experiment 4 – Nanoparticle ‘Quantum Dots’ – UV/VIS and Fluorescence (PSH532)
4/15	Experiment 4 – Nanoparticle ‘Quantum Dots’ – Data and Error Analysis (PSH530)
4/22	FINAL EXAM – PSH530
4/29	Makeup Lab(s). – (PSH530/PSH532)