Class Requirements and Grading Policy
Experimental Chemistry II, CH 462 & CH 462H
Writing Intensive Course
Winter 2016

1. All four experiments and reports must be completed to receive a final passing grade in CH 462 or CH 462H. The final grade is based mainly on your grades for the four assigned experiments.

2. You will receive a letter grade for each of the four experiments. These grades are based on both the lab reports and your performance during the laboratory. The final course grade will be a weighted average of these four grades, plus some consideration of your other writing assignments:

Expt 1 = 35 % Expt 2 = 20 % Expt 3 = 25 % Expt 4 = 20 %

3. Your performance in the laboratory is evaluated by the following criteria:
   (i) Preparation at the start of the lab period. For example, read the experiment ahead of time, arrive ready to begin with specific questions about procedure if necessary.
   (ii) Experimental technique, team work, and participation..
   (iii) Quality and completeness of data obtained and recorded in the formal notebook.

4. Report grades will both the science and the writing. Reports are expected to reflect data quality, data analysis, discussion content, critical evaluation of your results compared to accepted results, plus organization, writing style, and mechanics (grammar, punctuation, units, etc.). More information about the form and expectations in reports is given below and will be discussed the first day of class.

5. Working in groups of 2-4 is a necessity given our lab time/resource constraints. Group work can also be an advantage in allowing for more complex experiments, and by providing opportunities for peer interaction and discussion. Students within a group will often share the same data set, however, **each student is required to do their own data analyses (individual spreadsheets, figures, etc.) and write their own report.** Of course, this means individual answers to questions as well. Photocopies or multiple printouts of shared raw data are acceptable, but everything else must be your own work.

6. **There is a dramatic penalty for late reports** - a deduction of one +/-grade level for **each day late for each report** (a weekend counts as 1 day). In other words, the highest possible grade for a one day-late report is A-, after 2 days it's B+, and etc… Reports are late after 1:15 PM on the due dates indicated in the schedule. Scheduled class time on the report due date is meant for the new experiment, and is not a time to finish writing, printing, or assembling reports.

7. You will submit two reports for grading in Expt 1 and a single final report for each Expt 2, 3 & 4. The first report, based on only three experimental sections for Expt 1, will be graded and returned with verbal and written comments. A complete final revised report for Expt 1 is due after the experiment has been completed. The final grade for Expt 1 will include the grades on both reports.

8. You will also participate in a peer review of one report this term.

Lab Reports

The ACS Style Guide, 2nd or 3rd ed. (American Chemical Society, Washington, DC, 1997 or 2006; http://pubs.acs.org/doi/pdf/10.1021/bk-2006-STYG.fw001) should be your principal resource for the correct writing formats and style, as well as examples from actual published articles in an ACS journal. Below are some specific requirements for this class, and some reminders about the ACS writing style. There is also a helpful online departmental Chemistry Writing Guide (link on course web supplemental page).

1. Reports must be submitted as a hard copy to the main course Instructor.

2. Reports should start with a *Cover Page*, containing only the experiment number and a descriptive title, author and lab-partner(s), group number, and date. Page numbers should be used starting with the second page.

3. The second page of your report should contain only an *Abstract* that states a short overview of the project, a brief sentence on techniques used to study the problem, and provides a short summary of specific findings, with an estimate of errors as much as possible, and gives the main conclusions. The abstract should be approximately 200 words and written in the present tense. A general rule for abstracts is to be as specific as possible, avoiding general statements.

It was found that large or small polymer chains can be made by different methods.	Worse
M_n for poly(ethylene) samples prepared by anionic and emulsion polymerization are determined by light scattering to be 5.6×10^5 and 4.2×10^3, respectively.	Better

4. No *Introduction* or *Experimental* sections should be written or submitted. Thus, you do not need to provide details on experimental procedures, unless they have been changed from those provided. If so, indicate these changes in the *Results* or *Discussion* section where appropriate. If you have questions, ask the instructor about what should or should not be included in reports.

5. The *Results and Discussion* section should follow the *Abstract*. The purpose is to provide the data obtained in a clear, well labeled, and logical sequence and use significant discussion. Most of the figures and tables in your report should be inserted in text of the *R&D* section (see below for additional info.). The *R&D* section should include a succinct narrative text that describes and explains the information presented here. The experiment handouts generally give directions to guide your analysis of the data obtained. Use this section of text to explain the purpose of all the figures, tables, and sample calculations

presented. All figures and tables in your report must be referenced in your report: avoid "orphan" data, figures and tables. Place each figure or table close to the discussion of it by electronically pasting it into the document, or by placing it on the following new page in the report. Never allow figures or tables to creep from one page into the next page. Learn how to size these elements to fit on one page. Very long tables may extend over more than one page if the table number is repeated on the second page, along with the column headers.

The questions posed in "report guide" section of the lab manual are intended to help guide you with the *Discussion*. While you should answer these questions and provide information requested in the lab manual, you are also encouraged to follow through with other ideas or problems that you encountered during your experiment. You are strongly encouraged to think critically about how and why your results compare with expected or published results. For example, if your results are higher or lower than those reported in the literature, use sound science to offer a few examples of what might cause this to happen.

6. If you have lengthy sample calculations, charts, etc., they should be attached to the end of your lab report under the heading, "*Supplemental Information*". Sample calculations should be provided for complex calculations or where requested. Don't spend a lot of time formatting equations on the word processing software (unless you enjoy this) – legible handwritten equations are fine.

7. A *References* section should include ACS-style citations to the literature cited in the report. See the ACS style guide especially for the proper format for citations. **Cite the reference by number in the actual report text as it is used. Don't list "orphaned" references. All references listed must be used in the report.** Examples:

   1. Bode, H.; Jenssen, H.; Bandte, F. *Angew. Chem.* **1953**, *65*, 30.
   2. Dresselhaus, M.; Dresselhaus, G.; Eklund, P. *Science of Fullerenes and Carbon Nanotubes*; Academic: New York, 1996; pp 126-141.

8. The duplicate (blue) pages from your notebook should be attached to the end of each report (not the original pages). Part of the grade will depend on the legibility, organization, accuracy, and completeness of notes taken during the lab periods.

Some important details on Report style/content:

- The pages in your lab report should be consecutively numbered, beginning with the *Abstract* on p.2.
- Avoid the use of first or second person in reports.

  We/I refluxed the solution at 90 °C for an hour. Worse

  The solution refluxed at 90 °C for 1 h. Better

- Be careful with significant figures in tables, figures, and calculations. Some examples:

  $90.0314\ g / (1.31\ g/cm^3) = 68.7\ cm^3$ ←← 3 sig. figs. in result

  $90.031\ g + 1.3\ g = 91.3\ g$ ←← 1 decimal place in result

  $4.5 \times 10^{-4}\ Hz * \pi^2 = 4.4 \times 10^{-3}\ Hz$ ←← 2 sig. figs. in result

- Each discussion should contain some indication of sources of error in the experiment. If at all possible, this analysis should be quantitative, or at least semi-quantitative, to provide some insight into the significance of the error sources. Example:

  The desk vibrated a little, which made the curve noisy once in a while, but we could easily measure the peak really accurately. Worse

  Background noise, due mainly to external vibrations, was estimated to be 1 – 5 W/kg RMS. Since the peak height is 130 W/kg, this adds <5 % error to the peak integration. Better

- Figures and Tables should always include a number and a **descriptive title or caption,** for example:

  Figure 1. Mass uptake vs. reduced pressure for Zeolite 5A.
  Table 2. Powder diffraction data obtained for Zeolite 5A.

- The labels "Chart" and "Graph" are not used in the ACS style.

- All figures and tables are called out by number in your report, for example:

  A plateau was observed at reduced pressures greater than 0.1, as indicated in Table 1.

- Capitalize the words Table and Figure when they refer to a specific number.

  In Table 1, the intrinsic viscosity is determined by extrapolation of ….

- Axes require labels that include both the variable name and units. Axes should use reasonable scales to clearly show the data and have labeled tic marks.

- Table columns headings should specify the units employed.

- Remember to display table entries with the appropriate number of significant figures; you can adjust the spreadsheet to give the appropriate format(s). Graph axes and/or labels do not need to show all significant figures, the numbers should be as short as possible for clarity.

- Don't write decimals less than 1 without a leading 0. This holds true for text, tables, and figures.

  Bad: The sample weighed .462 g.
  Good: The sample weighed 0.462 g.

- Watch out for significant figures in text and tables! A temperature of 175.56 °C is pretty hard to believe. It's probably 175 (1) °C.

- Be careful of words/phrases like “should have been”, “expected value”, and “reasonable”. These generally need to be replaced by something like “differ from previous reports by”, or similar, and are almost certainly going to need a citation.

  Bad: The viscosity was not reasonable; it was much lower than expected.
  Good: The viscosity obtained was significantly less than that obtained by xxx and xxx [1].

  In the good example, [1] is a literature citation.

- Use the symbol font and enjoy life with a more diverse character set. Don’t write out the words Angstroms, degrees, microns, and etc. Use Å, °, μ, etc.

- Use accepted abbreviations. Don’t write out the unit names grams, meters, etc.

  Bad: We obtained 7.6 grams before drying at 120 degrees Celsius.
  Good: The product (7.6 g) was then dried at 120 °C.

University Policies:

Please note: "Students with documented disabilities who may need accommodations, who have any emergency medical information the instructor should know, or who need special arrangements in the event of evacuation, should make an appointment with the instructor as early as possible, no later that the first week of the term. In order to arrange alternative testing, the student should make the request at least one week in advance of the test. Students seeking accommodations should be registered with the Disability Access Services (DAS). Please see their web page for more information: http://ds.oregonstate.edu/home/

Please note: The College of Science follows the university rules on civility and honesty. These can be found at http://oregonstate.edu/admin/stucon/.

Cheating or plagiarism by students is subject to the disciplinary process outlined in the Student Conduct Regulations. Students are expected to be honest and ethical in their academic work. Academic dishonesty is defined as an intentional act of deception in one of the following areas:

* cheating- use or attempted use of unauthorized materials, information or study aids
* fabrication- falsification or invention of any information
* assisting- helping another commit an act of academic dishonesty
* tampering- altering or interfering with evaluation instruments and documents
* plagiarism- representing the words or ideas of another person as one's own

Behaviors disruptive to the learning environment will not be tolerated and will be referred to the Office of Student Conduct for disciplinary action.

"The goal of Oregon State University is to provide students with the knowledge, skill and wisdom they need to contribute to society. Our rules are formulated to guarantee each student's freedom to learn and to protect the fundamental rights of others. People must treat each other with dignity and respect in order for scholarship to thrive. Behaviors that are disruptive to teaching and learning will not be tolerated, and will be referred to the Student Conduct Program for disciplinary action. Behaviors that create a hostile, offensive or intimidating environment based on gender, race, ethnicity, color, religion, age, disability, marital status or sexual orientation will be referred to the Affirmative Action Office."