STUDENT PACKET—CHEM 111
Fall 2014 and Spring 2015

PENN STATE UNIVERSITY
DEPARTMENT OF CHEMISTRY

SYLLABUS

Director of General Chemistry Laboratories: Dr. Joseph T. Keiser
Office: 211C Whitmore
Office Hours: by appointment, jtk1@psu.edu
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Section Supervisors: TBA

For Drop/Add and other Administrative details contact: Suzanne Sunday in the Undergraduate Chemistry Office, Room 210 Whitmore, 865-9391.

Additional administrative information may be found on the Chem 111 ANGEL website at https://cms.psu.edu.

GETTING STARTED – Fall Schedule

<table>
<thead>
<tr>
<th>Course-Section</th>
<th>1st Lab Meeting</th>
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<tbody>
<tr>
<td></td>
<td>1:25 PM – 5:30 PM</td>
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<tr>
<td>Chem 111-102</td>
<td>Tuesday, September 2, 2014</td>
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<td></td>
<td>8:00 AM – 12:05 PM</td>
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<tr>
<td>Chem 111-103</td>
<td>Tuesday, September 2, 2014</td>
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<td>1:25 PM – 5:30 PM</td>
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<tr>
<td>Chem 111-104</td>
<td>Tuesday, September 2, 2014</td>
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<td>6:30 PM – 10:35 PM</td>
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<tr>
<td>Chem 111-105</td>
<td>Wednesday, September 3, 2014</td>
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<td>1:25 PM – 5:30 PM</td>
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<tr>
<td>Chem 111-106</td>
<td>Wednesday, September 3, 2014</td>
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<td>6:30 PM – 10:35 PM</td>
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<tr>
<td>Chem 111-107</td>
<td>Thursday, September 4, 2014</td>
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LOCATION: All of the General Chemistry Labs are located on the first floor of the Whitmore Laboratory Building. On the first day you should go there 10 minutes before the start of your lab period and look for the posted lists which will indicate where to go for your introductory lecture. This will last for about an hour. Afterwards, we will proceed to the lab to complete the "Check-In/Orientation" experiment which is contained in this packet.
### GETTING STARTED – Spring Schedule

<table>
<thead>
<tr>
<th>Course</th>
<th>Date</th>
<th>Time</th>
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<tbody>
<tr>
<td>Chem 111-101</td>
<td>Monday, January 12, 2015</td>
<td>1:25 PM – 5:30 PM</td>
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<tr>
<td>Chem 111-102</td>
<td>Monday, January 12, 2015</td>
<td>6:30 PM – 10:35 PM</td>
</tr>
<tr>
<td>Chem 111-103</td>
<td>Tuesday, January 20, 2015</td>
<td>8:00 AM – 12:05 PM</td>
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<tr>
<td>Chem 111-104</td>
<td>Tuesday, January 20, 2015</td>
<td>1:25 PM – 5:30 PM</td>
</tr>
<tr>
<td>Chem 111-105</td>
<td>Tuesday, January 20, 2015</td>
<td>6:30 PM – 10:35 PM</td>
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Monday's sections will start a week earlier than the others, because there are no classes on Jan. 19th (MLK Day).

You MUST have the following 3 items before you can be checked in to lab:

1. Lab Manual - “PSU Chemtrek” – This will be used for both Chem 111 and 113. The current edition is Aug. 2014. The Aug. 2013 version may also be used, provided that you write in the updated information (this will be provided upon request).

2. Chem 111 Student Packet, Fall 2014/Spring 2015 – This is what you have in your hand. This contains the course syllabus and other handouts necessary for the course.

3. Chem 111 Lab Kit (comes in a big blue zipped bag, sold in the Penn State Bookstore).

You may supply your own eye protection if you already have it, but it will need to be approved by your Teaching Assistant (Note: Regular eyeglasses are not sufficient).

It would also be a good idea to buy a scientific calculator if you do not already own one. It is not important for it to be programmable, but it should be able to handle logs, exponentials, trigonometric functions, and scientific notation.

**WEAR APPROPRIATE CLOTHING**—Lab is potentially a messy experience. A T-shirt, blue jeans, and shoes (or sneakers) would be reasonable. (No sandals allowed.) We reserve the right to send you home to change if you are not dressed appropriately.
The Course Vision

Chem 111 is an introductory chemistry laboratory experience that gives students the opportunity to put into practice the essential principles utilized in a professional chemistry laboratory regarding topics relevant to Chem 110.

Essential Principles:

attention to detail
free-form writing
proper use of a lab notebook
use of the literature
experimental design
interpretation of data/statistics
an awareness of safety issues
an awareness of environmental issues
appreciation for what instruments can and cannot do

The Learning Goals for Chem 111 are:

To illustrate phenomena and principles relevant to Chem 110
To provide training in fundamental laboratory manipulative skills
To ingrain habits of safety, economy, and environmental awareness
To develop efficiency in preparing for and carrying out laboratory experiments
To give practice in accurate observation and recording of data
To gain experience in recognizing sources of error and estimating their importance
To acquire the ability to plan and produce a useful report of laboratory work that meets acceptable standards of completeness, accuracy, clarity, and neatness
Dear Chem III Students,

Welcome to our General Chemistry Laboratory program. In the fall of 1993 we revamped our program using the "Small Scale" approach. The philosophy behind small scale chemistry is to use the smallest possible scale that teaches the desired points. This approach has many advantages over the traditional experiments. These are discussed in Chapter 3, "Small Scale Techniques ...".

We are one of the first major universities to adopt this approach in both our General Chemistry and our Organic Chemistry Laboratories. But, there is evidence that this is the wave of the future. For example:

- The Journal of Chemical Education now has an entire section of each issue devoted to small scale chemistry.

- The American Chemical Society (ACS) devoted an entire issue of one of its periodicals (ChemUnity) to small scale chemistry. One of ACS's regional directors wrote a strong editorial in favor of small scale chemistry as part of this article (a copy is attached). The entire issue has been sent to 20,000 chemistry teachers nationwide.

- The State of Massachusetts and the Environmental Protection Agency (EPA) have both funded the National Microscale Chemistry Center at Merrimack College. The goal of this Center is to train teachers in small scale techniques. (An article on this Center is attached.)

- Science published an article entitled, "Innovations in Teaching." One of the people featured in this article was Steve Thompson (author of Chemtrek). A copy of this article is attached.

I would also like to point out that this small scale trend in education parallels current developments in research and industry. The same technology which has enabled the computer chip to shrink, is enabling the analytical lab to shrink. In fact, scientists are already developing the "chemistry lab on a chip" (two articles are enclosed).

The day is coming in which you will be able to have an analytical lab in your wrist watch! And, as a result, chemical analyses will be faster, safer, cheaper, and involve less waste .... i.e., smaller is better for the 21st century.

Please feel free to talk to me if you have any questions or comments regarding these developments, or any other matters regarding this course.

Sincerely,

Joseph T. Keiser
Director of the General Chemistry Laboratories
Grading

Lab Reports
For most experiments your lab report will consist of your "on the fly" notes, data, and your answers to the questions associated with the experiment. One experiment, "The Chemistry of Natural Waters" (Expt. 10) will require a formal report, which will count as the equivalent of two lab reports.

Lab reports/assignments should be handed in on time. If they are not handed in on time, substantial penalties will apply (−5% for each weekday that is late). Material which is more than one week late will not be accepted.

Quizzes/Test
There will be short quizzes given at the beginning of most lab periods according to the schedule. Questions may cover details of the particular experiment, general laboratory procedures, and safety. Students who arrive late for lab (i.e., after the quiz has been collected) will receive a zero on that quiz. There will also be a cumulative lab test given on the last day of laboratory. Enclosed in this packet are outlines of what will be covered on each quiz and on the lab test.

Instructor Evaluation
The instructor will assign a grade to each student based on his/her perception of each student's performance in the lab. This will include the use of the laboratory notebook, attitude, independence, and technique.

Lab Monitoring
Each student will be assigned one day for which they are responsible for lab monitoring. This will normally entail an end of the period clean up of the shared areas such as the sinks, balances, and the chemical supply area.

The Final Grade

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<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Notebook and Formal Report</td>
<td>50%</td>
</tr>
<tr>
<td>Prelab quizzes</td>
<td>15%</td>
</tr>
<tr>
<td>Final</td>
<td>25%</td>
</tr>
<tr>
<td>TA Evaluation</td>
<td>10%</td>
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Teaching Assistants
Most of the time you will be working with a Graduate Teaching Assistant (TA). Your TA will supervise your work in the laboratory and grade your reports and quizzes. The final grading decisions, however, will be made by Dr. Keiser.
Miscellaneous Policies

Attendance: Each student is expected to be present in the laboratory at the beginning of each session and to remain in the laboratory for all the scheduled time unless explicit instructions to the contrary are given. A grade of zero will be assigned for any laboratory missed unless permission for a make-up has been given.

Make-up Requests: If a student has a legitimate excuse for missing a lab (e.g., family emergencies, a note from your Doctor), then they should complete a Make-up Request Form (one is on the next page) and drop it off in the mail slot on the cubicle on the 1st floor of Whitmore. If possible, you should try to attend one of the other sections that same week. If not, then most likely you will be asked to attend a special make-up experiment which will be held during your normal laboratory period on the week before the lab test. In this latter case, you will still be held responsible for the material covered on the missed experiment for the lab test. Typically, only 1 make-up lab is allowed. If you find you will miss 2 or more labs, see your section supervisor as soon as possible.

Conflict Exams: (Usually this only affects the evening lab sections)
Many Departments now schedule exams in the evenings. Sometimes these may conflict with a scheduled laboratory meeting. In these cases you are expected to come to lab. The Department which is giving the exam is expected to offer you a suitable make-up opportunity. This will normally involve giving you the same exam at a different time. (Note: most Departments have a cut off date for the scheduling of conflict exams. Be sure to check through your entire semester’s schedule for lab/exam conflicts.)

The Lab Notebook: You are expected to keep a detailed and legible laboratory notebook in this course. We will use the notebook as a cross between a professional laboratory notebook, and a lab journal (similar to a diary). Some guidelines on how to do this are given in the section of this packet entitled, “How to Keep a Laboratory Notebook.” At the end of each day, you must have the lab instructor sign and date your lab notebook. All original data and observations should be recorded in your lab notebook. Your notebook will typically be turned in at the end of each laboratory period.

Lab Neighbors: You should feel free to discuss the experiments with your neighbors, but reports must be written up individually—i.e., your reports must be in your own words. If any information in your reports (either notebook or formal reports) comes from someone else, then it must be clearly referenced. The presentation of someone else’s work under your name is plagiarism. There are serious penalties for plagiarism, potentially including an “F” in the course, and an academic dishonesty “flag” on your transcript. Note: the facilitation of plagiarism, for example by posting your lab reports to the web, is also considered academically dishonest. A full listing of all Penn State policies on ethics and honorable behavior that apply to this course is given at http://www.psu.edu/ufs/policies/.

Office Hours: “Open” office hours are held in room 211 Whitmore—i.e., any Chem 111 student may go to any Chem 111 TA’s office hours. But, if possible, you should try to attend your own TA’s office hours, since he/she will be more familiar with your work.

Clever Chemist Awards: Have an idea for improving an experiment? Discuss it with your TA and Section Supervisor. If possible, we’ll make arrangement for you to come to another section to work on your idea. If successful, you will be given a Clever Chemist Award!
Academic Integrity

Academic integrity — scholarship free of fraud and deception — is an important educational objective of Penn State. Academic dishonesty can lead to a failing grade or referral to the Office of Student Conduct.

Academic dishonesty includes, but is not limited to:

- cheating
- plagiarism
- fabrication of information or citations
- facilitating acts of academic dishonesty by others
- unauthorized prior possession of examinations
- submitting the work of another person or work previously used without informing the instructor and securing written approval
- tampering with the academic work of other students

How Academic Integrity Violations Are Handled

In cases where academic integrity is questioned, procedure requires an instructor to notify a student of suspected dishonesty before filing a charge and recommended sanction with the college. Procedures allow a student to accept or contest a charge. If a student chooses to contest a charge, the case will then be managed by the respective college or campus Academic Integrity Committee. If a disciplinary sanction also is recommended, the case will be referred to the Office of Student Conduct.


Accommodating Disabilities

Penn State welcomes students with disabilities into the University's educational programs. If you have a disability-related need for reasonable academic adjustments in this course, contact the Office for Disability Services (ODS) at 814-863-1807 (TTY). For further information regarding ODS, please visit the Office for Disability Services Web site, http://equity.psu.edu/ods/

In order to receive consideration for course accommodations, you must contact ODS and provide documentation. If the documentation supports the need for academic adjustments, ODS will provide a letter identifying appropriate academic adjustments. Please share this letter and discuss the adjustments with your instructor as early in the course as possible. You must contact ODS and request academic adjustment letters at the beginning of each semester.