

# Introductory Chemistry Laboratory ~ CHM 105 (Laboratory for Chemistry 103) Course Information and Syllabus ~ Fall Semester, 2017

## Course Instructors

### Laboratory Director

Cindy Graham Brittain, PhD

Email: [cbrittain@chm.uri.edu](mailto:cbrittain@chm.uri.edu)

Office: Beaupre 117D and 325D

Phone: 401-874-2028

Office Hours: available via URI's Starfish Success Net

### Laboratory Instructors

Sections 3, 12, 14: Kevin Bian, [kbian@chm.uri.edu](mailto:kbian@chm.uri.edu)

Sections 4, 8, 10: Michelle Gonsalves, [mgonsalves@chm.uri.edu](mailto:mgonsalves@chm.uri.edu)

Sections 1, 2, 6: Riley Kirk, [rkirk@chm.uri.edu](mailto:rkirk@chm.uri.edu)

Sections 5, 7, 9: Jennifer Rodriguez, [jrodriguez@chm.uri.edu](mailto:jrodriguez@chm.uri.edu)

Sections 11, 13: Qi Tang, [qtang@chm.uri.edu](mailto:qtang@chm.uri.edu)

## Required Laboratory Materials

- CHM 105 Laboratory Manual, \$15 at URI Bookstore
- RAM account and ID card to purchase items at the Beaupre 180 Stockroom (no cash can be accepted at Stockroom)
- Safety goggles/glasses, \$6 – \$10 at Stockroom (cash accepted at Beaupre 115 Learning Center, in first week of classes)
- Knee-length lab coat, \$18 at Stockroom
- For *some* experiments, protective nitrile gloves, \$0.25 per pair at Stockroom
- A scientific calculator, with logarithm and exponent functions
- Lab Prep Lessons and Announcements at the CHM 105 Sakai website

*Students must take responsibility for carefully studying all lab materials, and following all study/safety instructions.*

## Attendance

CHM 105 is a laboratory course, which requires hands-on experimentation and direct observation of physical and chemical changes. For this reason, *students MUST be present to conduct each experiment*. Attendance is *required* at the day and time for which each student has registered. Under *NO* circumstances will students be permitted to attend a lab section other than the one for which they have officially registered (except for the Mandatory Safety Training in Week 1).

The course includes 11 laboratory experiments, and a 12<sup>th</sup> make-up experiment. As the course grade is based on completion of 10 experiments, each student is permitted *ONE absence without penalty*. Any student who has a second absence *MUST* complete the make-up experiment on the designated days in the last week of classes. A reservation at the Beaupre 180 Stockroom is required to participate in a make-up lab session.

*Students who do not complete 10 experiments can expect to receive a failing grade in the course. "Complete" means the student submitted the Pre-Lab Assignment, passed the Pre-Lab Quiz, worked the experiment, and submitted the Report Sheet.*

## Grading Policy

The course grade will be based on the following:

10 Pre-Lab Assignments (20 points each)	200 points
10 Pre-Lab Quizzes (20 points each)	200 points
10 Lab Performance Assessments (10 points each)	100 points
10 Report Sheets (60 points each)	600 points
Mandatory Laboratory Safety Report Sheet	50 points
Laboratory Final Exam	250 points
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	1400 points

It's important to note that for *each* lab experiment, students have the opportunity to earn a total of 110 points:

- 20 points for the Pre-Lab Assignment,
- 20 points for the Pre-Lab Quiz,
- 60 points for the Report Sheet,
- 10 points for the Lab Performance Assessment.

The Mandatory Lab Safety Report Sheet provides an additional 50 points, and the Lab Final Exam makes up the remainder of the grade (250 points). *NO* extra credit assignments will be given, and the standard grading scale will be in effect:

90%+ = A- / A; 80-89% = B- / B / B+; 70-79% = C- / C / C+; 60-69% = D / D+; <60% = F

Grades in CHM 105 are *earned* by demonstrating mastery/proficiency in the required skills; these skills include not only the chemistry laboratory techniques, but also problem-solving, critical thinking, and the ability to apply course concepts within relevant laboratory scenarios.

*To be clear:* Each student's grade is determined by the *quality* of that student's performance on the CHM 105 work items (described in detail below). The grade is *not* open to negotiation, and it is *not* dictated by what's needed to progress in the student's chosen program of study. The grade must be *earned* by achieving *proficiency in* (and ideally – *mastery of*) the skills identified as essential to ongoing success in the student's degree program.

Students should also be aware that the CHM 103 lecture and CHM 105 lab are separate courses. The lab is intended to complement the lecture by illustrating many of the lecture concepts; however, the timing of these concepts *may* or *may not* be synchronized with the lecture presentation. The lab also includes some additional concepts that are *not* taught in lecture.

***IMPORTANT NOTE to those CHM 105 students currently enrolled in the CHM 103 lecture course:***

***If you DROP the CHM 103 lecture course, you MUST ALSO DROP the CHM 105 lab.***

It is recognized that a number of students enrolled in the CHM 105 lab completed the CHM 103 lecture in a previous semester or previous academic year. For this reason, each of the experiments in the lab manual is written as a complete lesson, and supplemental materials – including video tutorials – are available at the Sakai course site. It's intended that any student who does a thorough job studying the provided course materials, preparing for each experiment, practicing the required skills, and utilizing the Study Help Resources should be able to succeed in the course.

## ***Laboratory Work Items:***

### ***1. Pre-Lab Assignments and Pre-Lab Quizzes***

Each laboratory experiment includes both a Pre-Lab Assignment and Pre-Lab Quiz, so students can demonstrate that they've thoroughly prepared for their experimental work.

Information about the Pre-Lab Assignments and Pre-Lab Quizzes is provided in the "*Remedies for Common Laboratory Ailments*" discussion presented on pages 3 – 12 of the CHM 105 lab manual. Students must take responsibility for reviewing these materials, contacting their lab instructor with any questions, and taking the necessary steps to prepare.

***Any student who comes to lab and does NOT have the lab manual, the completed Pre-Lab Assignment, and the required personal protection items will NOT be permitted to conduct the experiment (and will thus receive a ZERO for that week's experiment).***

Pre-Lab Quizzes will be given promptly at the start of each lab period, after attendance and drawer inventory. Students who arrive late (after the quiz has been completed) will receive a zero for that day's quiz.

### ***2. Report Sheets***

The Report Sheet is due at the *NEXT lab meeting the student attends*, and it must be submitted at the *START* of that lab session.

***An immediate late penalty of 10 points will be assessed for Report Sheets NOT submitted to the lab instructor at the START of the lab session. An additional 10 point late penalty is assessed EACH business day after the due date, so that Report Sheets which are a full week late are worth ZERO points.***

As described in the "*Remedies*" discussion, the Report Sheet *MUST* be written in blue or black ink. Your lab instructor *MUST* look over your data/observations, and sign the Lab Notebook pages before you leave the lab.

### ***3. Lab Performance Assessment***

During each experiment, the lab instructor will objectively assess each student's performance in the lab, and assign 0 to 10 points for appropriate laboratory behavior and technique.

*Lab performance points are AWARDED for:* demonstrating familiarity with the experimental procedure, demonstrating proper experimental technique, keeping personal lab bench and communal areas clean, properly (and carefully) disposing of waste, interacting appropriately with fellow students and the teaching assistant, and adhering to safety regulations.

*Performance points will be DEDUCTED for:* unsafe experimental technique, leaving personal lab bench or communal work areas messy (chemical spills or equipment left out/in disarray), improper disposal of chemical waste, removal of safety glasses/goggles during an experiment, non-emergency cell phone use or disruptive behavior during the laboratory period.

#### **4. Laboratory Final Exam**

The Final Exam is mandatory, and it is comprehensive. A Lab Skills Summary will be provided at the Sakai course site to assist students in studying for the Final Exam. *ALL* 11 lab experiments are represented on the Final Exam; students who have missed several laboratory sessions may find themselves at a disadvantage in taking the Final Exam.

#### **Laboratory Safety**

*NOTHING* is more important than the personal safety of the occupants of the laboratory.

*Thus any student who deliberately or carelessly disregards a written or oral safety instruction will be expelled from the laboratory and will receive a grade of zero for the experiment. A student who is expelled twice from the laboratory for safety violations will automatically receive a failing grade in the course.*

Careless disregard of safety instruction includes (but is not limited to) the following:

1. Any student who improperly disposes of chemical waste (pours solutions into laboratory sinks, or places solid waste into a garbage can).
2. Any student who does *NOT* have the following personal protection items: safety glasses or goggles, lab coat (clothing which covers the arms to below the elbow and legs to below the knee), protective (nitrile) gloves (when required), shoes which fully enclose the foot (no open toe or heel) and socks.
3. Any student who has *NOT* completed the Pre-Lab Assignment or is *NOT* able to answer questions on the Pre-Lab Quiz (so as to demonstrate effective preparation for that day's experiment).
4. Any student who uses a cell phone in lab without prior permission, or for reasons other than a laboratory emergency.

*Students who forget to bring their personal protection items will face a costly penalty:*

Students with inappropriate footwear can purchase protective booties (~\$2.50). However, a replacement pair safety glasses or a lab coat must be purchased at full price (~\$10 and ~\$21, respectively). None of these items may be returned to the stockroom after they've been worn.

#### **Department Safety Policies:**

- Students must be wearing their personal protection gear (lab coat and safety glasses or goggles) *BEFORE* they enter a teaching laboratory. (Students are to put on nitrile gloves at the time they begin working the experiment.)
- No student is permitted to enter a chemistry lab room unless they're wearing *BOTH* a lab coat and safety glasses or goggles. These items *MUST* be worn at all times while students are in a chemistry lab, and they can be removed only *AFTER* students have safely exited the lab room.
- Chemistry department personnel are *prohibited* from loaning safety glasses by State of Rhode Island health/hygiene regulations. Students who forget their safety glasses should *NOT* ask about loaner eyewear, and *must* purchase a replacement pair of safety glasses at full cost.

#### **Laboratory Equipment Bills**

Each lab student is responsible for the equipment provided in his/her assigned drawer. Because that drawer is shared with students in other sections, each student *must* carefully inventory the equipment in the drawer to verify that all items are present and in good working order. This inventory *must* be conducted at both the *beginning* and *end* of every lab period.

Students will be charged for any items that they break during their own lab section. Students will *also* be charged for any items reported missing or broken by the student who inventories that drawer at the beginning of the *next* lab section.

Students *must* take responsibility for checking the Chemistry Stockroom website to determine whether they have an outstanding lab equipment bill. A link to the Stockroom website is available from the CHM 105 Sakai course site.

The deadline to pay lab equipment bills at the Chemistry Stockroom is at the close of business at the end of Final Exam week. Any student who has an unpaid bill at the Chemistry Stockroom after that day will have a sanction (a hold) placed on their e-Campus account. This sanction may prevent students from registering for classes, obtaining a transcript, or obtaining a diploma.

## *CHM 105 Schedule of Experiments – Fall 2017*

<i>Date</i>	<i>Experiment</i>
M 9/4	<i>Labor Day Holiday</i>
T 9/5	<i>Advising Day</i>
W 9/6	Course Info, Check-in, Safety
Th 9/7	Course Info, Check-in, Safety
F 9/8	Course Info, Check-in, Safety
M 9/11	
T 9/12	Course Info, Check-in, Safety
W 9/13	Lab 1. Measurements
Th 9/14	Lab 1. Measurements
F 9/15	Lab 1. Measurements
M 9/18	
T 9/19	Lab 1. Measurements
W 9/20	Lab 2. Density
Th 9/21	Lab 2. Density
F 9/22	Lab 2. Density
M 9/25	
T 9/26	Lab 2. Density
W 9/27	Lab 3. Separation of a Mixture
Th 9/28	Lab 3. Separation of a Mixture
F 9/29	Lab 3. Separation of a Mixture
M 10/2	
T 10/3	Lab 3. Separation of a Mixture
W 10/4	Lab 4. Determining a Chemical Formula
Th 10/5	Lab 4. Determining a Chemical Formula
F 10/6	Lab 4. Determining a Chemical Formula
M 10/9	<i>Columbus Day Holiday</i>
T 10/10	Lab 4. Determining a Chemical Formula
W 10/11	Lab 5. Structure, Geometry, Polarity
Th 10/12	Lab 5. Structure, Geometry, Polarity
F 10/13	Lab 5. Structure, Geometry, Polarity
M 10/16	
T 10/17	Lab 5. Structure, Geometry, Polarity
W 10/18	Lab 6. Six-Bottle Study
Th 10/19	Lab 6. Six-Bottle Study
F 10/20	Lab 6. Six-Bottle Study

<i>Date</i>	<i>Experiment</i>
M 10/23	
T 10/24	Lab 6. Six-Bottle Study
W 10/25	Lab 7. Stoichiometry
Th 10/26	Lab 7. Stoichiometry
F 10/27	Lab 7. Stoichiometry
M 10/30	
T 10/31	Lab 7. Stoichiometry
W 11/1	Lab 8. Ideal Gas Law
Th 11/2	Lab 8. Ideal Gas Law
F 11/3	Lab 8. Ideal Gas Law
M 11/6	
T 11/7	Lab 8. Ideal Gas Law
W 11/8	Lab 9. Solubility and Solutions
Th 11/9	Lab 9. Solubility and Solutions
F 11/10	Lab 9. Solubility and Solutions
M 11/13	<i>Veterans' Day Holiday</i>
T 11/14	Lab 9. Solubility and Solutions
W 11/15	<i>Monday classes meet</i>
Th 11/16	Lab 10. Reaction Rates
F 11/17	Lab 10. Reaction Rates
M 11/20	
T 11/21	Lab 10. Reaction Rates
W 11/22	Lab 10. Reaction Rates
Th 11/23	<i>Thanksgiving Holiday</i>
F 11/24	<i>Thanksgiving Recess</i>
M 11/27	
T 11/28	Lab 11. Acids, Bases, Buffers
W 11/29	Lab 11. Acids, Bases, Buffers
Th 11/30	Lab 11. Acids, Bases, Buffers
F 12/1	Lab 11. Acids, Bases, Buffers
M 12/4	
T 12/5	Make-up Lab 12. Titration of Vinegar
W 12/6	Make-up Lab 12. Titration of Vinegar
Th 12/7	<b><i>Labs 11-12 Report Sheets due</i></b>
F 12/8	<b><i>Labs 11-12 Report Sheets due</i></b>

**COMMON WRITTEN LAB FINAL EXAM (For ALL CHM 105 Sections): Date/Time/Location to be announced**

## ***Study Help Resources***

### **• *Chemistry Graduate Student Teaching Assistants in the Beaupre 115 Learning Center***

The Beaupre Learning Center provides a study area for preparing for lab and working problems, and it's fully staffed by the Chemistry Department's Laboratory Teaching Assistants.

If you have a general question about lab, or need help with questions or calculations, you can see any one of the TAs (however, those TAs teaching the CHM 105, 102, or 114 Introductory or General Chemistry labs will be *most* familiar with the content of this course). A schedule of the Beaupre Learning Center office hours is available via a link in your CHM 105 Sakai site.

***The Beaupre Learning Center is recommended as the #1 study help resource for questions about chemistry lab courses, as the TAs actually teach the CHM lab courses. They are FAR more familiar with the particular experiments and expectations for lab reports than are the tutors at the Academic Enhancement Center.***

### **• *Chemistry Tutors at the Academic Enhancement Center (AEC)***

The AEC ([www.uri.edu/aec](http://www.uri.edu/aec)) can help you keep up with class work and study course materials more effectively. Their staff of learning specialists and student tutors can help you identify a study approach, develop effective study strategies, understand course concepts, and practice skills productively. You can study at the AEC alone or in small groups.

The AEC's tutoring service is designed to support the goals of in-class instruction and promote effective study techniques. The tutors are URI students who have been recommended by professors. They're hired based on their level of success in the courses they tutor, their excellent study skills, and their ability to work well with other students. Tutors conduct one-on-one and small group sessions for students in a variety of courses. The tutoring service is available by appointment and on a drop-in basis (first come, first served) and is *FREE*.

The AEC is open Monday – Thursday from 11 AM until 8 pm, and on Fridays until 2 pm. All services are free, and the coffee is free as well! For the schedule, please see the AEC website, call (401) 874-2367, or stop by the 4<sup>th</sup> floor in Roosevelt Hall.

### **• *Assistance from Dr. Brittain, during office hours or via email***

***Office Hours:*** Dr. Brittain's class, meeting, and office hours schedule is available to you through URI's Starfish Success Net. Students are welcome to schedule an appointment via Starfish, or simply walk in at a day/time when they can see Dr. Brittain is available.

***Email:*** Please understand that because Dr. Brittain has responsibility for several chemistry courses – all with high enrollments – she receives a substantial number of email messages each day. To ensure that your message will be answered, it's recommended that you:

- Use a *concise*, yet *descriptive* subject line.
- Include your full name, chemistry lecture (or lab) course number, and section number in the message.
- Make sure the question asked or information conveyed in your message is both *clear* and *complete*.

## ***Study Help Advice***

Whether you're seeking help from Dr. Brittain, a Chemistry Teaching Assistant, or an AEC Tutor, you'll want to arrive at your help session *on time* and *fully prepared*, to make the discussion as productive and efficient as possible.

This means you should bring all relevant study/reference materials with you to the session. This would include your CHM 105 lab manual, your data/observations from the lab experiment, your scientific calculator, and your *written* list of specific questions and/or your goals for the help session.

## ***Academic Honesty***

Although students are conducting each experiment in pairs, ***each student's Pre-Lab Assignment, Pre-Lab Quiz, and Lab Report Sheet MUST be completed on an individual basis.***

Students who submit work that is clearly the same as another student's work are in violation of the University's Policy on Academic Honesty. Those students will be held accountable as described in that Policy.

Academic dishonesty in *any* form is considered a serious offense, and disciplinary action will be taken immediately.

The URI policy on academic honesty is detailed in the student handbook (available online), and it is summarized below:

*Students are expected to be honest in all academic work. A student's name on ANY written work, including assignments, lab reports, papers, or exams, shall be regarded as assurance that the work is the result of the student's own thought and study. Work should be stated in the student's own words, properly attributed to its source. Students have an obligation to know how to quote, paraphrase, summarize, or reference the work of others with integrity.*

***When students are authorized to work jointly, group effort MUST be indicated on the work submitted.***

*The following are examples of academic dishonesty:*

- *Claiming disproportionate credit for work not done independently.*
- *Unauthorized use of another's work or preparing work for another student.*
- *Unauthorized possession or access to exams.*
- *Unauthorized communication during exams.*
- *Taking an exam for another student.*
- *Altering or attempting to alter grades.*
- *The use of notes or electronic devices (such as calculators, computers, or cell phones) to gain an unauthorized advantage during exams.*
- *Fabricating or falsifying facts, data, or references.*
- *Facilitating or aiding another's academic dishonesty.*

*When there is an allegation of academic dishonesty, the instructor may:*

- *Fail the student for the assignment, or recommend that the student fail the course.*

### ***Chemistry Department plagiarism policies specific to CHM 105:***

No section of your Pre-Lab Assignment, Pre-Lab Quiz or Report Sheet can be identical (or nearly identical) to that of another student without attribution. If sections of Pre-Lab Assignments/Quizzes or Report Sheets are the same (or nearly the same) as another source (e.g., a student's paper, a section of the lab handout or lecture textbook, an explanation from a TA, information posted on the internet), it will be regarded as plagiarism.

The consequence of a first instance of plagiarism is a grade of zero on that section of the graded paper. If there is a repeat instance of plagiarism, the penalty is a grade of zero on the entire Pre-Lab Assignment, Pre-Lab Quiz or Report Sheet.

A zero score due to a plagiarism incident will stand, and cannot be dropped as the lowest grade earned on a Lab Work Item.

### ***Important Fall 2017 Semester Deadlines***

- *Last day of e-Campus open add period: Tuesday, September 12<sup>th</sup>*
- *Last day of e-Campus add with permission number: Tuesday, September 19<sup>th</sup>*
- *Last day for students to drop courses via e-Campus with no transcript designation: Wednesday, September 27<sup>th</sup>*
- *Last day for students to drop courses via e-Campus, with "W" designated on transcript: Wednesday, October 18<sup>th</sup>*
- *Mid-term progress reports posted in e-Campus: Tuesday, October 24<sup>th</sup>*