

CHE 155L General Chemistry II Laboratory

Section A — F 8:30 – 11:20 AM — Science Wing, Plant Hall 108

Section E — F 11:30 AM – 2:20 PM — Science Wing, Plant Hall 108

Section I — F 2:30 – 5:20 PM — Science Wing, Plant Hall 108

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Office Hours: Dr. Wilson will be available 1:00 – 2:30 PM Monday through Thursday, and at other times by appointment.

Course Description: Laboratory experiments supplement lecture material presented in CHE 154.

Prerequisites: CHE 152 and CHE 153L (both with a grade of “C” or better). Pre- or corequisite: CHE 154 (with a grade of “C” or better).

Learning Objectives: In addition to reinforcing certain CHE 154 lecture concepts, students in CHE 155L will:

- Gain knowledge essential to a broad understanding of chemistry, including:
 - Stoichiometry of chemical reactions
 - Chemical equilibria, including those involving acids and bases
 - Thermodynamics
 - Kinetics
 - Chemical reactivity and properties of organic and inorganic compounds
 - Precision, accuracy, and related statistics
- Develop and practice critical thinking and problem solving skills.
- Develop the ability to study and learn independently.
- Develop and demonstrate competence in the use of scientific instrumentation, data collection and interpretation, and experimental design.
- Learn and implement best practices with regard to chemical safety.

Spartan Ready Competencies: The University of Tampa is committed to preparing students to become successful individuals with an advanced understanding of their field of study, the interdisciplinary workplace, how to be effective leaders and engaged citizens who contribute to society. Through co-curricular programs, students develop high demand competencies that are relevant for today's workforce. These make up the Pillars of Spartan Readiness which are supported by life skills education and training to be a professional. (<http://www.ut.edu/spartanready/>)

- **Critical thinking:** The ability to envision and employ analysis, interpretation and reason using information and data through cognitive processes. Examples include analytical thinking, problem solving, decision making, understanding qualitative data, understanding quantitative data, and reading comprehension.
- **Interpersonal Abilities:** The ability to develop personal insight in order to engage with others and create meaningful relationships, which will lead to effective collaboration. Examples include civility, building trust, overcoming personal conflict and differences, dealing with difficult people, building good work relationships, social skills etiquette, learning to compromise, and handling difficult conversations.
- **Organization:** The ability to effectively and efficiently manage and/or systematize resources, time and individuals to accomplish goals and tasks. Examples include time management, project management, prioritizing, strategic planning, attention to detail, multi-tasking, coordination, and dealing with the unexpected.
- **Self-Awareness:** The ability to demonstrate an understanding of how inherent and/or developed personality traits and characteristics contribute to personal and professional success. Examples include resilience, reliability, adaptability/flexibility, personal work ethic, integrity, motivation/initiative, independence, stress management, and dealing with failure.
- **Teamwork:** The ability to successfully build, lead, manage, motivate and work with others. Examples include delegation, leadership, following, conflict resolution, accountability, and cooperation.

Required Materials: General Chemistry II: Laboratory Manual, duplicate page laboratory notebook (you may continue use of your CHE 153L laboratory notebook), a scientific calculator (a phone or other electronic device may *not* be substituted for a calculator), safety glasses (must have clear lenses which meet the OSHA Z87 specification), lab coat, and proper attire (in accordance with UT Chemistry Department rules).

Attendance: If you are to miss class on school business or due to illness, inform your instructor as soon as possible. Documentation is required for an excused absence from a lab, and the grade for such a lab will be replaced by the average grade on all other labs at the end of the semester.

Communication: Class announcements, course materials, and grades will be posted on Blackboard. Students are responsible for monitoring their UT email account and the course Blackboard site (<http://ut.blackboard.com>).

Laboratory Preparation: Students are required to read and be familiar with the week's experiment *before* laboratory begins, including completing any associated pre-lab assignment. This habit will help in understanding the pre-lab lecture and in carrying out each experiment both safely and efficiently.

Pre-Lab Lecture: It is imperative students be punctual and attend the pre-lab lecture. The lecture introduces the experiment, addresses important information necessary to complete the lab report, and discusses specific items regarding safety and chemical disposal methods.

Safety: Safety rules will be strictly enforced. Students must be familiar with these procedures and abide by them at all times. Safety is taken very seriously both for your own protection and that of others in the laboratory. Safety glasses, lab coat, clothing and shoes must be consistent with the safety policy outlined in the laboratory manual in order for a student to be permitted in the laboratory. The use of cell phones, iPods, or similar devices in the laboratory is prohibited. They should be turned off, including any vibrate feature before laboratory begins.

Lab Notebook: Each student must keep his or her own lab notebook. It is designed to be a permanent record of your experiment and should be legible and organized. All recording in the lab notebook must be in *ink*, with mistakes denoted by a single line drawn through the error and correct information written above, below, or next to the mistake. The original error must be legible through the strike-out; *no* white-out is to be used in the lab notebook. The first two pages of the lab notebook should be left blank to create a Table of Contents, to be updated as new experiments are recorded. Each experiment should start on a new page, beginning with the title of the experiment and the date performed. During the experiment, the lab notebook will be used to record a description of the experimental procedure followed and all data collected; the data sheet from the lab manual may serve as a template for data collection. Some of the data will later be transferred to the lab report pages and/or used in calculations, but they must first be recorded in the lab notebook as the experiment is performed. Data are *not* to be written on separate sheets or scraps of paper and then transcribed into the notebook at a later time. The lab notebook should include at least the following:

- The title and date of the experiment, with your full name and those of your lab partner(s).
- A description of the experimental procedure followed.
- All raw data collected during the experiment.
- All calculations pertaining to the experiment, with work shown.
- Any observations you found relevant and errors you may have made.

Labs: Each lab is worth 100 points, divided among the following three parts:

- The pre-lab assignment, due at the beginning of class. (15 points)
 - A late assignment will be docked 5 points if turned in by the end of the class period; 10 points if turned in later. Assignments will not be accepted more than one week late.
- Participation in performing the experiment. (40 points)
 - Participation will be docked 5 points for arriving late, borrowing safety glasses and/or a lab coat from the lab stock, or repeatedly failing to comply with instructions. Participation in the lab may be denied for not adhering to the safety rules or arriving too late to be able to complete the experiment.
- The *yellow* copy of the lab notebook recording and any report sheets, post-lab assignment, and graphs, due at the beginning of the following class. (45 points)
 - A late assignment will be docked 5 points if turned in by the end of the class period; 10 points if turned in later. Assignments will not be accepted more than one week late.

Exams: There will be two written exams, each worth 200 points, given during the semester, a mid-term and a final (which covers the experiments of the second part of the semester). These exams are open book/open note and may include questions regarding observations, procedures, techniques, and calculations similar to those completed during the semester. Keeping an organized lab notebook with all observations, calculations, and other notes well-documented will improve the likelihood of scoring well on the exams. There are no make-ups for exams.

Grading: A total of 1300 points are possible in the course. Letter grades will be assigned as follows:

Grade	Point Range	Percentage Range	Grade	Point Range	Percentage Range
A	1300 – 1170 points	100.0 – 90.0%	C	974 – 910 points	74.9 – 70.0%
AB	1169 – 1105 points	89.9 – 85.0%	D	909 – 780 points	69.9 – 60.0%
B	1104 – 1040 points	84.9 – 80.0%	F	779 – 0 points	59.9 – 0.0%
BC	1039 – 975 points	79.9 – 75.0%			

This course and CHE 154 have separate grades; a student must make a grade of “C” or better in *both* courses to be eligible to take any chemistry class that requires either of them as prerequisites. Permission to retake the course during the fall or spring semester after having earned a letter grade in or having officially withdrawn from the course can only be granted by the department chair.

Schedule: The following is a tentative schedule for the semester:

Date	Activity
August 31	Introduction, Safety Rules
September 7	Molar Mass of a Volatile Liquid (Lab 11)
September 14	Molar Mass Determination by Colligative Properties (Lab 12)
September 21	Synthesis of Aspirin (Lab 13)
September 28	Kinetics of the Reaction of Phenolphthalein with NaOH (Lab 14)
October 5	Review
October 12	Mid-term Exam
October 19	Spectrophotometric Determination of an Equilibrium Constant (Lab 15)
October 26	Preparation of Nickel(II) Coordination Compounds (Lab 16)
November 2	pH Experiments (Lab 17)
November 9	Molar Solubility – Common Ion Effect (Lab 18)
November 16	Thermodynamics of the Dissolution of Borax (Lab 19)
November 23	<i>No Class</i>
November 30	Review
December 7	Final Exam

Additional Resources: The Academic Center for Excellence (ACE, <http://www.ut.edu/ace/>) in the Academic Success Center offers tutoring in several subjects, including chemistry. This is available at no charge above your tuition.

Disclosures: The University of Tampa syllabus disclosures may be found on this course's Blackboard site.