

Fall 2018

**Chemistry 150L: Basic Laboratory Techniques**  
1-credit hour, meeting on your scheduled afternoons

**Instructors**

Instructor	Section(s)	Location	Time	Email
Dr. Leon Venable	M	310W	2-5 pm	lvenable@agnesscott.edu
Dr. Mi-Sun Kim	T and W1	308	2-5 pm	mskim@agnesscott.edu
Dr. Mi-Sun Kim	W2	308	5:30-8:30 pm	mskim@agnesscott.edu
E. Henry	R1	308	2-5 pm	
Dr. Mi-Sun Kim	R2	308W	2-5 pm	mskim@agnesscott.edu

**Required Course Materials:** Lab goggles or safety glasses, a scientific calculator, a blue or black pen, and some kind of notebook for use in the laboratory (to record weights and measurements and comments etc)

**Recommended Course Materials:** Any general chemistry textbook

**Lab Manual:** The lab manual is available as a series of files on the lab course's *Moodle* site (<http://courses.agnesscott.edu/>)

**Pre-requisites:** There are no official pre-requisites, but you will be expected to be relatively proficient in algebra and use your scientific calculator.

**Co-requisite:** CHE150

**Course Description:** Chemistry 150L focuses on the experimental methods in basic scientific measurements, elementary reactions and analysis arranged around an environmental theme. It is an introduction to the scientific method and its practical application. It is also centered on the practice of teamwork as science is inquiry based and performed in collaboration with others. As a team, you will work to understand the objective of the lab, design and conduct your own experiments, analyze and interpret the data, and communicate your scientific findings (often in a written report). You will develop important leadership skills such as managing a project and other people, sharing responsibility, and developing interpersonal communication skills. It also provides you an opportunity to explore each experimental topic in greater depth than if you were to work alone.

**Specific Learning Outcomes**

You will:

- 1) Put into practice the scientific method of inquiry by investigating chemical principles through planning and conducting experiments and analyzing data.
- 2) Acquire basic practical laboratory skills by carrying out a variety of chemical experiments.
- 3) Increase ability to work and strategize in a team when faced with chemical laboratory problems.
- 4) Develop collaboration and communication skills through working in a team and writing collaborative laboratory reports.
- 5) Develop science writing skills through writing laboratory reports.

**Relevance to the departmental and college curriculum:** After completing this course and the associated CHE150 course, you may proceed to chemistry courses in the chemistry sub-disciplines: CHE220+L (inorganic and physical chemistry), and/or CHE240+L (organic chemistry), and/or CHE230 (analytical chemistry). CHE150+L can be used to satisfy the natural science distributional requirement under the 2014-15 catalog – OR– general education requirement entitled *SUMMIT IN STEM* if you are a first year student. CHE150+L are also required for the following majors and programs of study: Chemistry, Biochemistry and Molecular Biology, Biology, Neuroscience, dual-degree engineering, dual-degree nursing, and any pre-health tracks.

**Teamwork:**

At the beginning of the semester, you will be assigned a team based on your responses to a survey before the first lab session. Your team will work together for the entire semester, and you will be assigned a team role each lab session. This is to encourage you to learn to work together, to give you time to learn the roles, and to practice negotiating responsibilities.

**Team Roles**

While each role carries with it a set of responsibilities, the team will not function if it does not work together towards a common goal. The experimental work cannot not be completed accurately and in a timely fashion unless each person is a fully contributes to the endeavor. The responsibilities and expectations for the individual roles are as follows:

**Manager:** Oversees the lab session and lab report. This includes organizing and delegating work, handling time management issues within the team, calling team meetings, obtaining and perusing the Material Safety Data Sheet (MSDS) for each chemical and reporting safety issues to team. Also responsible for making sure that every member of the group has working knowledge of the whole experiment, writing the introduction/purpose and conclusion of the lab report, and turning in the final version of the lab report to the instructor.

**Chemist:** Oversees the preparation, handling, and disposal of the chemicals. This may include deciding what chemicals/solutions and amounts needed, deciding volumes and concentration of solutions to be prepared, and performs necessary calculations. Also responsible for assisting in data analysis and writing the results section of a lab report.

**Technician:** Oversees the setting up of the experiment. This may include gathering and reading background material and training fellow team members on use of an instrument and recording all data obtained during an experiment. Also responsible for assisting in data analysis and writing the procedure section of a lab report.

**NOTE:** *If your team has only two members, one member will serve as the Manager and the other as the Technician. The manager will divide up the Chemist responsibilities.*

**Course Structure:**

Before each lab session, you will read the laboratory procedure found on Moodle and take a pre-lab quiz (for more information see below). The pre-lab quiz is to ensure that you have read the lab and ready to engage with your team when arriving to the lab session.

During lab, you will first meet in BSC 308 with your team to discuss the lab and obtain additional instruction from the laboratory instructor. Each team member should be able to articulate the purpose of the lab, and the lab work should be organized and delegated to each member. Your team will then conduct a team quiz (for more information see below) to ensure that everyone is prepared to engage in the lab session and proceed to the laboratory in BSC 310W. You will then complete the lab together, analyze your data and draw valid conclusions based on your data analysis.

**Proper Lab Attire**

**Shoes:** Closed toe shoes that cover the tops, the sides, and the back of the foot. No flip-flops or crocs. If you wear improper shoes, you will be told to change before you can participate in lab.

**Clothing:** Shirt must have sleeves (NO TANK TOPS), back and shoulders must be covered (NO OPEN-BACK SHIRTS and NO COLD-SHOULDER TOPS), no bare midriffs (NO CROP TOPS), and pants or skirts MUST

reach the ankle. If your lab attire does not follow these rules, you will be told to change and return to lab. If you miss part of lab because you had to go change, you will NOT get extended time to complete the lab.

**Eye Protection:** Goggles or lab glasses MUST be worn at all time. If you do not have your goggles, you will either have to return to your dorm/apartment/house to get them or you will have to purchase a new pair. Failure to wear your safety eyewear at all times in the lab will affect your grade and may result in you being asked to leave the laboratory.

**Resource Center for Math and Science:** The *Science Learning Center* (branch of the RCMS) is staffed by science learning assistants (LAs). The LAs are happy to answer questions about your lab, and the center is a great place to work on your reports with other students. The Science Learning Center is in Campbell G-25, and the hours are posted outside the learning center.

### **Pregnant Women, Nursing Mothers or Immuno-suppressed Individuals**

These individuals should be aware that they may receive unwanted exposure to some chemicals in the lab. Official guidelines and resources are available from Alix Valcin (BSC101W) to assist you in making an informed decision about taking or continuing with this course. The guidelines recommend that you also:

1. Obtain a list of chemicals that will be in use in the course (see your instructor).
2. Take this information to your doctor, consult with the physician about the risks involved, and obtain advice from the doctor about taking or continuing the course.
3. The doctor should provide the chemistry department and your adviser with a letter indicating whether you should continue or drop the course. If the doctor advises dropping, the letter must indicate that you should not continue in the course due to a heightened health risk from exposure to substances used in the lab.

*If you do decide to drop the course, the chemistry department and the Academic Standards Committee will work on a solution to accommodate your academic needs.*

**Attendance:** Attendance to all laboratory and pre-lab sessions is **required**. If you miss a lab, you will receive a zero grade for that missed lab. However, if you know in advance that your attendance is not possible because of (i) death of an immediate family member, (ii) observance of religious holidays or (iii) participation in events or activities sponsored by the college, you should provide the professor with an excused absence explanation in writing as soon as possible and no later than 24 hours *before* the missed lab. Your lab instructor will ask you to contact one of the other laboratory instructors to request attendance on an alternative afternoon during the week of the missed lab. If you become seriously ill or injured or experience an emergency that will require you to miss a lab at short notice, you *must* notify the office of the dean of students (x6391) of your situation as soon as possible (and you should ask the dean of students to contact your professors on your behalf). Again, your lab instructor will ask you to contact one of the other laboratory instructors to request attendance on an alternative afternoon during the week of the missed lab. However, if the office of the dean of students lets your instructor know that your emergency will last several days, at the discretion of your instructor you may not be required to make up the missed lab and your final lab report average will be calculated based on the other *nine* lab report grades.

**Punctuality:** Please be on time for class. If you miss the pre-lab session, you may have missed vital safety discussions and you should report to the instructor prior to working in the lab. If the lateness is unexcused, you will not be allowed to attend lab and will receive a grade of zero for that lab. *Please note:* Students arriving late to lab will **NOT** be given extra time to complete the lab.

**Lab Time:** Due to liability concerns, students must have finished all laboratory work and have their workspace cleaned by the end of the scheduled lab time (5pm or 8:30 pm for the W2 lab).

**Pre-Lab Online Quizzes:** Prior to each lab there will be an online quiz worth 10 points that each student must take prior to the laboratory period. These quizzes will be available on Moodle starting one week before the due date and will be removed for grading 30 minutes before the lab starts on the day of lab. Students will receive a grade of zero on a quiz that is not taken before the scheduled laboratory session. These quizzes are open note

and open book. You have unlimited time to complete the quiz, but can only make one attempt at your online quiz with the exception of the first quiz on lab safety.

**First Pre-Lab Quiz on Lab Safety:** A lab safety video and quiz are posted to Moodle. This quiz must be completed before the first lab day. This is the only quiz which will allow you more than one attempt to complete the quiz.

**Team Quizzes:** After your group has met, assigned team roles, discussed the lab purpose and procedure, and organized the lab work at the beginning of lab, there will be a short team quiz worth 10 points. Each team member will earn the team quiz score. If a team would like the instructor to review a quiz answer, the team may write a *group appeal* to explain their answer for full or partial credit. The group appeal must be turned into the instructor by the end of that lab session.

### **Personal and Team Assessments**

At mid-term and at the end-of-semester, you will be given opportunity to reflect and to give and receive feedback on your performance as well as your teammates' performances. Personal and team-function assessments provide critical information to guide your personal growth and develop leadership skills. The mid-term assessment will be conducted in survey form and provide feedback to each member of the team. You will receive 100 points for completing this survey. The final assessment will assess the team product by having each member of the team and the instructor distribute a pool of 100 points to each group member based on their contributions during the semester. A rubric is provided on Moodle to guide you in determining your point distribution. Your total pool of points will make up your end-of-semester team grade. The final team assessment grade will be an average of these two grades.

**Grading Policy:** There will be 10 chemistry labs (see the following page or *Moodle* for the schedule). For Labs 1 through 6, and 8 you will turn in the pages you printed from Moodle, containing your lab findings and calculations (one per team), in person to your lab instructor. Labs 7, 9 and 10 will require a full written lab report (one per team), which should be submitted electronically through *Moodle*. Guidelines for these reports will be given later in the semester. A table on the following page shows the due dates for all 10 lab reports or pages. Each team member receives the team grade for that report. If your team does not submit your report or pages on time, each team member's score will be reduced by three (3) points per day (deducted from the team report grade), including Saturdays and Sundays, up to a maximum of 7 days.

**Workload Statement:** This is a 1-credit class that meets 3 hours per week on most weeks during the semester. To succeed in a 1-credit lab course you should expect to spend an average of 1-2 hours per week outside of lab on lab work during the weeks that you have lab scheduled (this does not include the hours you spend specifically on the associated CHE150 classroom course). You should find that you spend up to an hour outside of lab per quiz for each pre-lab quiz (and the general preparation for the lab associated with that quiz), and you should find that you spend around 4 hours outside of lab per report for each of the three formal lab reports.

**Appointments:** Appointments may be made with your instructor or with Ellen Humphreys ([ehumphreys@agnesscott.edu](mailto:ehumphreys@agnesscott.edu)) via e-mail. Please see the information at the top of the first page of this syllabus for your instructor's e-mail address.

**Plagiarism:** Collaboration among team members and other teams before, during and after the lab is encouraged and all lab reports as well as in-lab quizzes are team efforts. However each team member's written work should be unique and reflect their own words. Each team member should sign all team-submitted work, as this will serve as your honor pledge for that work. For the pre-lab quizzes, your answers should be obtained through individual effort, and you may use information given on Moodle, in textbooks, and through a science learning assistant. The opportunity to cheat on quizzes is obvious and tempting; however, mechanisms have been

instituted to determine if cheating on quizzes has occurred. Any assignment where plagiarism or cheating has occurred will be assigned a grade of zero, and the student(s) responsible will be referred to honor court.

**Students with disabilities:** Agnes Scott College seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in this class, please contact Rashad Morgan in the Office of Accessible Education (X6174) to complete the registration process. Once registered, please contact your lab instructor via e-mail to make an appointment so that there can be a discussion in person about the specific accommodations needed for this course.

Fall 2018

### Tentative Che 150 Lab Schedule

Week of	Lab	Due This Week
8/27	No lab – not a full week of classes	--
9/3	No lab – Labor Day Complete the online safety Quiz posted to Moodle	--
9/10	Lab 1 – Conversions and Units	Turn in lab 1 by 5pm on lab day
9/17	Lab 2 – Recycling Plastics (density measurements)	Turn in lab 2 by 5pm on lab day
9/24	Lab 3 – Metals in Water (flame test)	Turn in lab 3 by 5pm on lab day
10/1	Lab 4 – Calculations with Molar Mass	Turn in lab 4 by 5pm on lab day
10/8	No lab – Fall Break	--
10/15	Lab 5 – Analysis of White Powder (quantitative analysis)	Turn in lab 5 by 5pm on lab day
10/22	Lab 6 – VSEPR Theory	Turn in lab 6 by 5pm on lab day
10/29	Lab 7 – Oil Inquiry Lab	--
11/5	Lab 8 – Calculations with Stoichiometry	Turn in lab 7 by 2pm on lab day & Turn in lab 8 by 5pm on lab day
11/12	Lab 9 – Water Hardness Lab	--
11/19	No lab - Thanksgiving	--
11/26	Lab 10 – Dilutions, Solutions and Titrations	Turn in lab 9 by 2pm on lab day
12/3	No lab – last week of classes Team Assessment	Turn in lab 10 at 2pm on lab day and complete team assessment on Moodle

### Grading Requirements

Your final grade will be calculated using the following percentages for each category as follows:

Prelab quizzes average:	5.0%
Team quizzes average:	7.5%
Team assessment average:	7.5%
<u>Lab report average:</u>	<u>80.0%</u>
Total	100.0%

The lab report average is an average of the 10 submitted reports. Each lab is worth 100 points, and the distribution of points for an individual lab is defined by a rubric for each lab.

*Note:* Failure to follow prescribed safety requirements in the lab (e.g. wearing goggles) will result in point deductions from that lab grade.

**Absolute Grading Scale:** Your final grade will be assigned a letter grade according to the absolute grading scale shown below.

<b>A</b>	<b>93-100</b>	<b>C+</b>	<b>77-79</b>	<b>D-</b>	<b>60-62</b>
<b>A-</b>	<b>90-92</b>	<b>C</b>	<b>73-76</b>	<b>F</b>	<b>59 and below</b>
<b>B+</b>	<b>87-89</b>	<b>C-</b>	<b>70-72</b>		
<b>B</b>	<b>83-86</b>	<b>D+</b>	<b>67-69</b>		
<b>B-</b>	<b>80-82</b>	<b>D</b>	<b>63-76</b>		

*Note:* Student grades will not be curved

**Key dates not on our class schedule:**

Mon September 3<sup>rd</sup> - last day to add or drop a course using AscAgnes

Fri September 7<sup>th</sup> - last day to add a fall class using AscAgnes or change to AUDIT

Tues September 18<sup>th</sup> - last day to drop **without** a "W" grade

Weds October 31<sup>st</sup> - last day to drop with a "W" grade or change to pass/fail