

Spring 2018 Chemistry 365: Physical Chemistry Laboratory
4-credit hours, meeting Monday 1-5pm in BSC307E

Instructor: Professor Sarah A. Winget
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Office: BSC 301E; 404.471.5379
Office Hrs: Tue 12.15-1.15pm, Wed 2-3pm

Course Description: This is an in-depth laboratory based course that will allow students to study key experimental physical chemistry concepts, gain experience with equipment and instrumentation used in physical chemistry research, and increase their understanding of fundamental physical chemistry topics through hands on experiments. Topics will span the fields of thermodynamics, kinetics and quantum mechanics and students will use a variety of scientific instruments and equipment. A significant amount of time will also be spent on data analysis and calculations

Pre-requisites: CHE220, CHE220L, MAT119

Learning Outcomes: At the end of this course students will have:

- 1) Increased their knowledge and understanding of physical chemical principles, by using these principles within the laboratory environment.
- 2) Increased their problem solving skills, by carrying out detailed calculations and data analyses.
- 3) Acquired experience with instrumentation and equipment typically used by experimental physical chemists, by carrying out a variety of experiments utilizing different pieces of scientific equipment.
- 4) Increased their ability to strategize in a team when faced with laboratory problems, through planning experiments and analyzing data within teams.
- 5) Developed their collaboration and communication skills through working in teams, writing collaborative laboratory reports, and giving group oral presentations of their findings.
- 6) Developed science writing skills through writing individual laboratory reports in the style of research articles.

Relevance to the departmental and college curriculum: CHE365 can count as the in-depth laboratory course that is required for all students majoring in Chemistry. CHE365 can also count as 4 of the 16 credits beyond CHE150 that are required for all students completing a Chemistry minor, and it can count as the 4 additional chemistry/biology credits required for all students majoring in Biochemistry and Molecular Biology (BMB). Please note, CHE365 is a *required* course for the American Chemical Society (A.C.S.) approved Chemistry major.

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

Recommended Course Materials: Any physical chemistry text book such as Physical Chemistry for the Biosciences by Raymond Chang, University Science Books, 2005.

Moodle: The lab manual is available as a series of files on the *Moodle* site

Grading:

Your final grade will be determined as follows:

An average of the individual written reports for labs 3-4	40%
An average of the group oral reports for lab 1-2	30%
An average of the data/sheets turned in for labs 5-7	30%

Absolute Grading Scale:

A	93-100	B-	80-82	D+	67-69
A-	90-92	C+	77-79	D	63-66
B+	87-89	C	73-76	D-	60-62
B	83-86	C-	70-72	F	0-59

Note: Student grades will not be curved

Grading Policy: There will be 7 different chemistry labs. Please see *moodle* for the schedule. For two of the labs each *group* will give a 20 min oral presentation of their findings to Dr Winget. For two of the labs each *student* will submit an electronic version of a lab report (in the style of a physical chemistry research article) through the appropriate section of the *moodle* site. For three of the labs each group will submit data/sheets to Dr Winget. Guidelines and rubrics will be available on *moodle*. Due dates are listed on the schedule on *moodle*, and students will lose 5% points per day, including weekends, up to a maximum of 7 days for late work.

Attendance: Attendance to all laboratory sessions is **required**. If you miss a lab session, you may receive a zero grade for the associated 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. If you become seriously ill or injured or experience an emergency that will require you to miss a lab at short notice, you should notify the office of the Office of Academic Advising (x5192 or cmcpheeters@agnesscott.edu) of your situation as soon as possible and ask them to notify your advisers and professors of your circumstances. Your professors will then work with that office to discover the best course of action for your personal circumstances.

Pre-labs: There will be no official pre-lab discussions, as each group of students will be working on a different experiment each week. Instead, detailed background information will be posted on *Moodle* before you begin each new lab. Please familiarize yourself with the relevant reading prior to starting a new lab.

Lab Time: Due to liability concerns, students must have finished all laboratory work by the end of the scheduled lab time (5.00pm). Students should move to BSC304W to continue data analysis and calculations at 5.00pm.

Workload Statement: This is a 4-credit course that meets 4 hours per week. To succeed in a 4-credit course the college expects you to spend 10-12 hours per week on the course (including scheduled classroom time). That means you should be spending an average of 6-8 hours per week outside of class on this course.

Appointments: Appointments may be made with Dr Winget via e-mail (swinget@agnesscott.edu)

Proper Lab Attire:

Shoes: Closed toe. No flip-flops or crocs.

Eye Protection: Goggles or lab glasses must be worn at all time.

Academic Honesty: The Agnes Scott College honor code embodies an ideal of character, conduct, and citizenship, and is an important part of the College's mission and core identity. This applies especially to academic honesty and integrity. Passing off someone else's work as your own represents intellectual fraud and theft, and violates the core values of our academic community. To be honorable, you should understand not only what counts as academic dishonesty, but also how to avoid engaging in these practices.

Please note that in this course you are encouraged to work with others, but the work completed must be your own. You must not copy from another student's written report (or from any other source) when writing your own lab report. When providing images in written reports or oral presentations, if you did not make the image yourself please make sure it is clear where the image came from. Please also cite all sources of any facts that you provide, unless they are facts that are generally available in any physical chemistry text book.

Course Evaluation: Near the end of the semester you will be notified by email, and provided with a link to follow, to complete course evaluations online outside of class. You are expected to complete the them as your feedback is extremely valuable to Dr. Winget, the department, and the administration. Of particular importance are constructive comments that help Dr. Winget improve the course.

Accommodations: 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 Academic Advising (X6174 or rmorgan@agnesscott.edu) to complete the registration process. Once registered, please contact Dr. Winget by email in order to make an appointment to discuss the specific accommodations needed for this course.

Inclusion: This course adheres to the principles of diversity and inclusion integral to the Agnes Scott community. We respect people from all backgrounds and recognize the differences among our students, including racial and ethnic identities, religious practices, and gender expressions. We strive for our campus to be a safe space in which all students feel acknowledged and supported. We request and invite your thoughtful and constructive feedback on ways that we can, as a community of learners, respectfully assist and challenge one another in our individual and collective work.

Title IX: For the safety of the entire community, any incidence of, or information about, sexual misconduct must be reported immediately to Title IX Coordinator Marti Fessenden (mfessenden@agnesscott.edu, 404-471-6547), Deputy Title IX Coordinator Karen Gilbert (kgilbert@agnesscott.edu, 404-471-6435), or Vice President for Student Life and Dean of Students Karen Goff (kgoff@agnesscott.edu, 404-471-6449).

This course adheres to the principles of diversity and inclusion integral to the Agnes Scott community. We respect people from all backgrounds and affirm people's decisions about gender expression and identity. Please feel free to correct Dr. Winget if your preferred name or gender pronoun are different from that listed on the class roster.

Tentative Schedule for CHE365A Spring 2018 (edited Jan 22 2018 due to snow days)

- There are 5 students signed up, so there will be 2 groups of students
- Please see Moodle for guidelines and rubrics for these lab reports and presentations

Dates	Group 1 (2 students)	Group 2 (3 students)	Due today
M-Jan 15	NO LAB - MLK HOLIDAY	NO LAB - MLK HOLIDAY	
M-Jan 22	Welcome/introduction – no wet lab due to snow days last week – reading for GC lab	Welcome/introduction – no wet lab due to snow days last week – reading for bomb calorimetry lab	
M-Jan 29	Lab 1: GC lab	Lab 1: bomb calorimetry lab	
M-Feb 5	Lab 1 contd: GC lab	Lab 1 contd: Bomb calorimetry lab	
M-Feb 12	Lab 2: bomb calorimetry lab	Lab 2: GC lab	Oral presentation of first lab
M-Feb 19	Lab 2 contd: Bomb calorimetry lab	Lab 2 contd: GC lab	
M-Feb 26	Lab 3: Polyenes	Lab 3: kinetics	Oral presentation of second lab
M-Mar 5	NO LAB – PEAK WEEK	NO LAB – PEAK WEEK	
M-Mar 12	NO LAB – SPRING BREAK	NO LAB – SPRING BREAK	
M-Mar 19	Lab 4: kinetics	Lab 4: polyenes	Written lab report for third lab
M-Mar 26	Lab 5: HCl / DCl Lab	Lab 5: HCl / DCl Lab	Written lab report for fourth lab
M-Apr 2	Lab 5 contd: HCl / DCl Lab	Lab 5 contd: HCl / DCl Lab	
M-Apr 9	Lab 6: Nano particles Lab	Lab 6: Computational Chemistry Lab	Turn in data/sheets for fifth lab
M-Apr 16	Lab 6 contd: Nano Particles Lab	Lab 6 contd: Lasers/Optics	
M-Apr 23	Lab 7: Computational Chemistry Lab	Lab 7: Nano particles Lab	Turn in data/sheets for sixth lab
M-Apr 30	Lab 7 contd: Lasers Optics	Lab 7 contd: Nano Particles Lab	
R-May 3			Turn in data/sheets for seventh lab