

Spelman College
CHE 111 General Chemistry 1 - Section 1
Course Syllabus Spring 2019

Instructor

Dr. Dulma Nugawela

Email

dnugawel@spelman.edu
Office phone: 404-270-5740

Office Location & Hours

Albro-Falconer-Manley Science
Center 376

Lecture

M W F 12.00 noon -12.50 pm, SC 233

TR 1.00 pm - 1.50 pm, SC 134

Office Hours: M T W - 1.30 -3.30 pm, or by appointment

Course Description: CHE 111 is a 3-credit hours course and it is the first half of a two-semester General Chemistry course.

The course is intended to provide students with basic knowledge of general chemistry. Topics include measurements, elements and compounds, chemical bonding, chemical reactions, gas laws, thermochemistry, electronic structure and atomic theory. The course includes 4 fifty-minute lectures each week. Pre- or co-requisites: Math 115: CHE 111L

Textbook and required material

Text book: The Essential Concepts, Raymond Chang and Kenneth A. Goldsby, 7 th edition, McGraw Hill publishers, New York, NY [2014]

Online Homework: McGraw-Hill Connect/ LearnSmart, an online adaptive learning and homework system. Access code cards can be purchased from the bookstore or purchased online. Each student need to register for this course at the following web site: <http://connect.mheducation.com/class/d-nugawela-spring-2019-mwtrf>.

Calculator: Casio fx-300MS or Sharp EL-520 WB-BK or equivalent calculator. Students are not allowed to use graphing calculators for this course. Departmental calculators can be provided for the chapter tests and final exam. Students are encouraged to bring their own calculator to the class.

Optional materials:

Solutions Manual: Student Solutions Manual to Accompany Raymond Chang, 7th ed.

Eubanks, Lucy T. and Eubanks, Dwaine I., Preparing for Your

ACS Examination in General Chemistry, ACS Exam Institute, 2011.

Rationale

The first course in general chemistry will introduce those students majoring in chemistry, biochemistry or chemical engineering and those required to take chemistry (e.g. other science and /or pre-health track major) to the basic concepts that will set the foundation for the second semester course and other upper level courses.

Instructional Methods:

Learning will occur through pre-class preparation, in-class sessions (lectures) and after class online assessments. Course materials will be located on the Moodle course page. Students are expected to prepare for the class by reading textbook, power point slides. Class time will focus on lectures, problem-solving and Q&A sessions.

Goals of the Course: Students who successfully complete this course are expected to have a basic understanding of atomic and molecular structures and be prepared for understanding the consequences of these concepts in the continuation of this course. Students should be able to write simple chemical reactions and develop mass relationships from those chemical equations. Students should be able to classify and predict reactions in aqueous solution. An understanding of the gas phase is expected as is an understanding of the energy changes that take place during chemical reactions, how the changes are measured, and the significance of those measurements. Students should be prepared to take Chemistry 112, the continuation of general chemistry.

Attendance

Regular class attendance is important for the success in this course. If a student is unable to attend class on a given day, they are responsible for learning the material covered during that period. If you miss due to a college required absence or documented illness you will be allowed to make up quizzes and tests during my office hours or a discussed time. If you simply miss class, you will not be allowed to make up quizzes or tests.

Grading Policy

I do not curve grades. However, I do reserve the right to make changes to the grading system. The grading system is outlined below,

Home work 10% : Homework assignments will be given on CONNECT, these will be graded.

Quizzes 5% : You will have 4 quizzes in lecture. Quizzes will not be given during a week of a chapter test. Quizzes given in lecture will be given first 20 minutes of class. If you miss a quiz, it will count as a zero. Therefore, please do not be late to class since you end up missing a quiz.

Chapter tests 40% : There will be 9 chapter tests based on material covered during lectures. The exam include multiple choice, fill in blanks, short answer, essay or calculation. Missed exams are to be made up within 2 days (48 hours) of the original exam date. Highly encourage to take the exam ahead for an excused absent by the undergraduate dean's office. However, it is student's responsibility to arrange a make-up time with the instructor.

Final exam 30% : The final will be a standardized multiple-choice test developed by the American Chemical Society(ACS). This is a cumulative exam over the entire semester and will be held on Wednesday, May 8th from 01:00 p.m. - 03:00 p.m.

Extra credit 10 % : There will be opportunities during the semester for students to earn bonus points. These will be end of Chapter questions those can be done as a group of 2-4 students in each (Minimum of 2 students and Maximum of 4 students in each group).

Attendance, Class participation and Preparation 5% : LearnSmart in CONNECT and class attendance

Chapter tests	40 %
Homework	10 %
Quizzes	5 %
Final exam	30 %
Extra credit	10 %
Attendance / Class participation /Preparation	5 %

Grading Scale:

93 - 100	A	77 - 79	C+
90 - 92	A-	73 - 76	C
87 - 89	B+	70 - 72	C-
83 - 86	B	60 - 69	D
80 - 82	B-	Below 60	F

Chemistry Learning Center and tutoring

Free tutoring is provided to all students through the Chemistry Learning Center (CLC) located in Science Center room 348. CLC tutoring times and days will be posted on the CLC door and on the Moodle. It is suggested that the students think about questions they may have on a given chapter before going to CLC. Tutors are not there to teach a given topic or chapter; they will respond to specific questions. Keep in mind that Dr. Nugawela is always available to answer any questions you have. Students are encouraged to come with others in the class so that they can assist each other with course concepts. If a student desire individual tutoring, they can sign up for a session with a tutor in the Student Success Center in the Miligen Building.

Academic Integrity

At the heart of Spelman College's mission is academic excellence, along with the development of intellectual, ethical and leadership qualities. These goals can only flourish in an institutional environment where every member of the College affirms honesty, trust, and mutual respect. Students are expected to read and abide by the Standards of Excellence Honor Code, and are expected to behave as mature and responsible members of the Spelman College academic community. Students are expected to follow ethical standards in their personal conduct and in their behavior towards other members of the community. They are expected to observe basic honesty in their work, words, ideas, and actions. Failure to do so is a violation of the Spelman College Academic Integrity Policy. Violations will be subject to the sanctions outlines in the Spelman College Bulletin.

Disability Accommodation

Spelman College is committed to ensuring the full participation of all students in its programs. If you have a documented disability (or think that you may have a disability) and, as a result, need a reasonable accommodation to participation in class, complete course requirements in time, or benefit from the College's programs or services, you should contact the Office of the Disability Services (ODS) as soon as possible. To receive any academic accommodation, you must be appropriately registered with ODS. For further information about services for students with disabilities, please contact the ODS at 404-270-5289 or visit the office in MacVicar Hall, Room 106.

CHE 112/112 L

A minimum grade of C must be earned in both CHE 111 and CHE 111L in order for a student to advance to the CHE 112 lecture and CHE 112 L lab course. If a student earns a grade lower than a C, the CHE 111 course must be repeated. Note that lecture and lab are separate courses that earn individual grades. A student passing lecture but not lab (or vice-versa) will not have to repeat the course that was passed but they will not be allowed to proceed to the next level of chemistry without passing both lecture and lab components.

Note: This syllabus is a “living” document and may be revised during the semester at the discretion of the instructor. Any change that is made to the syllabus will only result in a benefit to the student.

Spelman College
Department of Chemistry and Biochemistry
GENERAL CHEMISTRY 111 LABORATORIES
Syllabus
Spring 2019

INSTRUCTORS:/ Office hours	SECTION	ROOM	OFFICE	PHONE	E-MAIL
Dr. Marisela Mancia MWThF: 2:00-3:00pm T: 9:00-11:00am	Exams (W) 6:00pm-7:30pm	SC 134	SC 377	404.270.5852	mmancia@spelman.edu
Dr. Kristini Miles M & Th: 11:00am-1:00pm	1-T 8:00-10:50am CRN: 11214	SC 156	SC 374	404.270.5746	kmiles9@spelman.edu
Dr. Kristini Miles M & Th: 11:00am-1:00pm	2-R 8:00-10:50am CRN: 12457	SCI 156	SC 374	404.270.5746	kmiles9@spelman.edu
Dr. Kristini Miles M & Th: 11:00am-1:00pm	3 – T 1:00:3:50pm CRN: 12901	SC 156	SC 374	404.270.5746	kmiles9@spelman.edu
Dr. Dulma Nugawela MTW: 1:30-3:30pm	4 – T 8:00:10:50am CRN: 13566	SC 156	SC 376	404.270.5740	dnugawel@spelman.edu

LABORATORY COURSE DESCRIPTION:

The General Chemistry 111 laboratory course is the first semester lab course in the general chemistry sequence and is to be taken concurrently with the General Chemistry 111 lecture course. The experiments that will be performed are based on the topics discussed in lecture. The goal of the lab course is to ensure that students understand how chemical concepts are discovered and used to analyze and evaluate experimental data.

LABORATORY REQUIREMENTS: (course text & materials)

- (a) General Chemistry Laboratory Manual (2018); ISBN: 9781323867150 by Pearson; **(required)**
- (b) Hayden-McNeil carbonless/duplicate set- Student lab notebook **(required)**
- (c) Chemical splash –resistant Safety Goggles. **(required)**
- (d) Lab coats or aprons, and gloves are **optional**.

PRE- and CO REQUISITES:

Chemistry 111 lectures are a corequisite, unless the student has already passed it.
 Pre-calculus I (MAT 115); Pre-calculus II (MAT 116); Accelerated Pre-Calculus (MAT 120) or higher is a corequisite, unless the student has already passed it.

GCHEM LAB COMMONS COURSE PAGE/ MOODLE WEB PAGE

Laboratory readiness is a critical part of the lab experience. ***Weekly laboratory Pre-lab information will be posted in the General Chemistry Laboratory Commons laboratory course Spel.eLearn (moodle) web page.*** These weekly summary slides describe the upcoming laboratory experiments. Lab procedures, techniques, instrumentation usage, data collection, and data analysis will be discussed so that the student will be familiar with what is expected in the lab the following week. Two of the 6:00-7:30 pm (recitation period) dates are for the departmental laboratory mid-term and final exams to be administered to all students.

LABORATORY GOALS:

Upon successful completion of the laboratory course a student will be able to:

1. Make observations, gather data, examine and analyze facts, and **arrive at solutions to problems in an experimental laboratory setting.**
2. Demonstrate **mastery of the chemical concepts** learned through the General Chemistry laboratory and lecture sequence (CHE 111 and CHE 112) by satisfactory performance on lab reports, quizzes and examinations.
3. Analyze and apply scientific knowledge and critical thinking skills throughout the laboratory exercise, and **demonstrate knowledge and scientific literacy** through effective written communication by satisfactory performance on **laboratory reports.**
4. Demonstrate a **mastery of basic laboratory skills,** learned through the laboratory sequence by independently being able to: set up equipment and apparatus, make solutions, operate small instruments and perform laboratory exercises. Satisfactory performance will be evaluated by experimental settings, random checks, and a laboratory practicum exam.
5. Enroll with a high degree of **confidence and knowledge** in higher level chemistry laboratory courses.

LABORATORY INFORMATION AND POLICIES:

Information regarding each lab experiment will be made available on the Spel.elearn (moodle) General Chemistry 111L commons course page. Each student who has enrolled in the recitation and laboratory should have access to these commons pages.

Students are expected to complete the pre-lab exercises and review questions before each lab and should check each week for any additional questions, review slides, and assignments posted on ***Spel.elearn (moodle)***. In addition, supplementary information regarding each experiment, such as a change in the experimental procedure, will be posted on the ***Spel.elearn (moodle)*** course page.

SAFETY:

During the first lab period (**week of August 28, 2018**), students are required to attend a safety lecture pertaining to the chemistry lab. **While in the laboratory, safety goggles must be worn at all times.** Safety "glasses or spectacles", along with prescription glasses are not allowed because they do not provide adequate splash protection. Students must wear goggles, even if they wear prescription lenses. Contact lenses are strongly discouraged but can be worn only if goggles are worn. Wear proper lab attire, including closed toed shoes at all times. **Anyone attempting to perform an experiment without safety goggles will be dismissed from the lab and receive a grade of zero for that lab report.**

PRE-LAB:

Before coming to the laboratory to perform a given experiment, the student is expected to have reviewed the recitation, read the experiment thoroughly, and to have written the following into the lab notebook:

(1) student's name and name of lab partner at the top of the first page for that lab; (2) title and date of the experiment, (3) a brief statement on the purpose of the experiment, (4) an outlined procedure (*including any announced procedural changes*). These sections will correspond to the first part of the laboratory report. The instructor or teaching assistant will initial the student's notebook at the beginning of the period to indicate that the purpose and procedure have been entered.

The **Lab Notebook** should be kept up-to-date and in traditional scientific format.

The instructor will dismiss any student who comes to lab without a pre-lab from the laboratory. That student will then receive a grade of zero for that lab report.

LAB PERIOD:

During the first **few minutes** of the lab period, the instructor will give a quiz pertaining to the day's experiment based on the materials the students were assigned to read to prepare for the lab. One quiz grade will be dropped in determining the final quiz average. **Quizzes are worth 10% of your final grade.**

At the beginning of the laboratory period, students will turn in a copy of the lab report from the previous lab. That report must be an original document that was written entirely by that student alone.

Students will work either individually or in pairs and will be assigned a given bench space. Each student is expected to collect data in their own notebook and have the data section initialed by the instructor after the lab has been completed. This information will be written under the heading (5) collected data.

Cell phones/ technologies: All cell phones/technologies (iPads, smart phones various music players, web books, laptops, etc. must be silenced from vibration and audible sounds) are to be turned off at all times during the laboratory period. Texting is not permitted during the laboratory period. Students using cell phones during a lab may be asked to leave and the missed lab may be counted as an unexcused absence.

- These devices cannot be utilized (i.e. used as a timepiece or a calculator) during exams and quizzes and should not be visible during this time.
- Absolutely no headphones or earpieces (with the exception of hearing aids) can be worn, whether they are on or off, at any time during the lab or during the exams.
- **Use of these devices during an exam or quiz will be regarded as Academic Dishonesty and a grade of zero will be given for the assessment.**

Students arriving 15 minutes late to lab will not be allowed to take the quiz, perform the experiment and will receive a zero for the corresponding report. No visitors are allowed during the lab period.

CLEANUP RESPONSIBILITIES:

Each week, students will be assigned the following tasks: (a) checking that all community glassware has been cleaned and returned to the appropriate location, (b) wiping all benchtops with a sponge and water, (c) ensuring that bench sinks remain clear of chemicals and trash and, (d) cleaning of any chemical spills in or around the balances. Any reports by faculty, staff or students in the following lab period of unclean glassware or spilled chemicals that were not cleaned up will result in a 10-point deduction in the lab reports of those students in that group.

LAB REPORTS:

Lab Reports are due one week after completion of the lab experiment. A report is to be submitted by each student for each experiment. Stapled laboratory reports are due at the beginning of the lab period (first 15 minutes) **late laboratory reports will not be accepted or graded (9 lab reports, 100 points each) (50%).**

The lab report will consist of the following sections:

(1) student's name and name of lab partner, clearly indicated; (2) title and date of the experiment, (3) a brief purpose, (4) an outlined procedure (*including procedural changes*), (5) collected data, (6) calculations & results (7) final results in a Discussion & Conclusion Format (8) answers to post-lab questions that have been assigned for that lab. The methods used in the calculations should be described in section (6) using examples. The final results should include any relevant discussion. **For more information, refer to the Laboratory Reports Handout.** Reports must be stapled and are due at the beginning of the following lab period. The lowest lab report grade will be dropped at the end of the term. If you miss a lab for any reason, that lab will probably be your dropped grade.

Students are not allowed to make up missed lab experiments in another section due to safety considerations. If a student misses more than one lab period due to extended illness (an excuse from the Office of Undergraduate Dean is necessary), death in the family, or other emergency that is officially recognized and excused by the Academic Dean, arrangements may be made for the student to write-up a report for the missed experiment.

EXAMS:

Two lab exams will be administered collectively (in SCI 134 for all sections) during the recitation period (Monday 6:00-7:30pm) on the dates indicated in the Course Schedule below. The first exam will cover experiments 1-5, (20%) and the second exam will cover experiments 6-9 (20%). *Students are not allowed to make-up missed lab exams.* Do not bring anything to the exam except a writing utensil.

You are not permitted to leave the room during an exam. When you leave the room, your exam time will end. **Use the restroom before the exam.**

This course is departmentally coordinated. To keep consistency across the sections, the following represents how a final grade will be determined for each student:

COURSE GRADING SCALE:

Quizzes (one drop)	10%
Laboratory Reports (one drop)	50%
Exams (2 total no drop, no replacement)	40%

Per Department standards, letter grades will be assigned according to the following grade scale:

93-100	A	77-79	C ⁺
90-92	A ⁻	70-76	C
87-89	B ⁺	66-69	D ⁺
83-86	B	60-65	D
80-82	B ⁻	Below 60	F

INCOMPLETE:

A grade of incomplete (I) will be given only in extreme cases where a student has completed the majority of the work in the course and has an excuse from the Dean indicating a legitimate reason why the course work cannot be completed by the end of the semester. The student must complete the required course work by the date indicated by the Registrar's office for the next semester. If the student has not done so, the *I* will be replaced by an *F*.

CHE 231 and 233L – Organic Chemistry:

A minimum grade of **C** must be earned in *both* the CHE 111 and 112 lectures and laboratories in order for a student to advance to the Organic course. A student failing lecture but passing lab may repeat the lecture course without repeating the laboratory (and vice-versa.) If a student does not earn a grade of **C** or better in either the lab or the lecture, that course must be repeated before the student is allowed to enroll in organic chemistry.

ACADEMIC HONESTY:

All members of the academic community of Spelman College are expected to understand and follow the basic standards of honesty and integrity, upholding a commitment to high ethical standards. Students are expected to follow ethical standards in their personal conduct and in their behavior towards other members of the community. They are expected to observe basic honesty in their work, words, ideas, and actions. Any student found by the instructor to have engaged in academic misconduct on a graded test, assignment, or examination is in violation of the Spelman College Academic Integrity Policy and will be assigned a grade of "F" for the course and may be subject to other sanctions outlined in the Spelman College Bulletin.

(ACADEMIC INTEGRITY POLICY on Spel.eLearn (class webpage)). Every student is responsible for reading and abiding by the Academic Integrity Policy. Again, violators will be subject to the sanctions outlined in the Spelman College Bulletin.

STUDENT ACCESS STATEMENT:

Spelman College is committed to ensuring the full participation of all students in its programs. If you have a documented disability (or think you may have a disability) and, as a result, need a reasonable accommodation to participate in class, complete course requirements, or benefit from the College's programs or services, you should contact Student Access Center (SAC) as soon as possible. To receive any academic accommodation, you must be appropriately registered with SAC. The SAC works with students confidentially and does not disclose any disability-related information without their permission. SAC serves as a clearinghouse on disability issues and works in partnership with faculty and all other student service offices. For further information about services for students with disabilities, please contact the SAC at 404-270-5289 (voice), located in MacVicar Hall, Room 106.

Please note all notifications from the Office of Disability Services must be submitted to your laboratory Instructor a week prior Lab Exam I to receive suggested accommodations.

PREGNANCY STATEMENT:

The College recommends that any student who is pregnant and enrolled in any laboratory and/or physical activity get written permission from her attending physician before participating in any laboratory and/or physical activity for the course. Please refer to the Student Handbook for the College's policy statement on Students with Serious Medical Conditions.

Instructors will provide all students with a syllabus outlining the experiments performed during a semester and Material Safety Data Sheets will be made available for any hazardous materials used during the course.

TITLE IX STATEMENT

Students, should note that certain sensitive conversation (shared online or in person) involving violence, emotional instability, or harassment of any kind cannot be held in confidence and must be reported in accordance with Title IX regulations. The Title IX Officer is responsible for coordinating the College's compliance with Title IX, including overseeing all complaints of sex discrimination, including sexual violence, and identifying and addressing any patterns or systemic problems that arise during the review of such complaints. Contact information for Title IX representatives can be found on the course Moodle site and on the Spelman website at <http://www.spelman.edu/title-ix>

**GENERAL CHEMISTRY II – SCHE 111L
COURSE SYLLABUS
DEPARTMENT OF CHEMISTRY & BIOCHEMISTRY – Spring 2019**

This agreement of understanding should be completed only after reading the syllabus and course schedule. Initial each understanding. Sign and date.

1. I understand the standards in this course and that I am responsible for monitoring my own learning. _____

2. I understand that I am responsible for being prepared for class each time the class meets. This responsibility includes, but is not limited to having a lab manual and a lab notebook. I am also required to complete assignments, to wear safety goggles and safe attire in the laboratory. _____

3. I have read the Academic Integrity policy and will not engage in any form of academic dishonesty in this course. I understand the consequences of violating the academic integrity policy of the college. _____

4. I understand the attendance requirements and penalties for being late to class. _____

5. I understand when assignments are due and the penalties for late work. _____

6. I understand that I am should questions and seek assistance from the instructor when I do not understand course content or requirements. _____

7. I understand how final grades will be determined. _____

8. I understand that the work of the course requires consistent classroom attendance and active participation. _____

9. I have read and understand the basis of letter grade evaluations. _____

10. I understand that the instructor is available to answer questions, help me grasp the material, and support my work in the course during regular office hours, by appointment, and by e-mail. _____

11. I understand that with prior student notification, the instructor reserves the right to make any modifications to this syllabus as circumstances dictate to facilitate the instruction of this course. _____

Name: _____
Print **Signature**

Date: _____

CHEM 111L – Spring 2019
Student Information

Name _____

Student # _____ (only if not registered for the course)

College _____

College PO box _____

Major _____

Local address _____

Local or cell phone _____

Permanent address _____

Permanent phone _____

e-mail address (Spelman e-mail if Spelman student)

Please sign the following statement. An incorrect course acknowledgement will be reported as an Academic Integrity Violation.

(1) I am currently registered for Chem 111 lecture, or I have passed Chem 111 with at least a grade of C (underline which one applies). (2) I am currently registered or fulfilled the Math prerequisites or corequisites for this class. (Math 115 or higher).

Signature

Spelman College
Department of Chemistry and Biochemistry
CHE 111L – Spring 2019
Laboratory Schedule 1.29.19

Lab Periods	Laboratory Exercise	Source: Moodle page & lab Manual
Jan. 16 (W, 6pm)	General Chemistry Laboratory I General Session	
Jan 22-24	Laboratory Safety, Laboratory Notebooks & Reports Safety quiz and laboratory equipment quiz	Docs@ lab commons; lab manual pp:1-10; 275-279
Jan. 29-31	Labs cancelled College closing due to inclement weather 1. Basic Laboratory Techniques (Measurements)	lab manual pp:11-29
Feb. 5-7	2. Identification of Substances by Physical Properties	lab manual pp:31-44
Feb. 12-14	3. Chemical Formulas	lab manual pp:45-58
Feb. 19-21	4. Chemical Reactions of Copper and Percent Yield	lab manual pp:59-68
Feb. 26-28	5. Gravimetric Analysis of a Chloride Salt	lab manual pp:69-81
Mar. 5-7	6. Reactions in Aqueous Solutions	lab manual pp:83-95
Mar. 6 (W, 6pm)	Exam I review Lab exercises 2-5 & Safety No experiments will be performed during March 11-15, Fall Break	
Mar. 19-21	7. Solutions and Molarity	Docs@ lab commons
Mar. 20 (W, 6 pm)	EXAM I covering Safety and on Laboratories 2-5	
Mar. 26-28	8. Behavior of Gases: Molar Mass of a Vapor	lab manual pp:97-109
Mar. 29 (F, 5PM)	Last day to withdraw from the course	
Apr. 2-4	9. Heat of Neutralization (Calorimetry)	lab manual pp:111-125
Apr. 9-11	Founder's day (April 11)	
Apr. 24 (W, 6 pm)	Exam II review Lab exercises 6-9	(lab report due)
May 1st (W, 6 pm)	EXAM II covering Laboratories 6-9	

TENTATIVE EXAM SCHEDULE

<u>EXAM</u>	<u>DATE</u>	<u>EXPERIMENTS COVERED</u>
I	Wednesday, March 20	Safety and Lab exercises 2-5
II	Wednesday, May 1st	Lab exercises 6-9

SPELMAN COLLEGE

CHE 345

FALL 2019

TR 9:25 – 10:40 AM

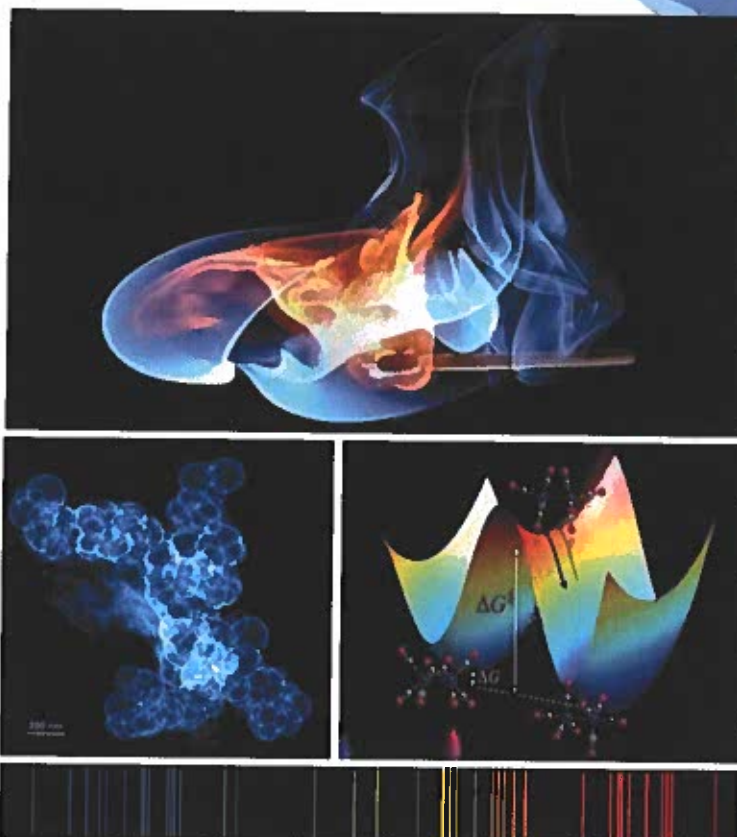
SCI 145

DR. LISA HIBBARD

OFFICE: SCI 346

404.270.5745

lhibbard@spelman.edu



Course Description and Rationale

This 3-credit hour course is the first semester of a two-semester sequence in physical chemistry covering chemical kinetics, chemical thermodynamics, and quantum chemistry.

Prerequisites: CHE 232; MATH 232; PHY 151.

Pre- or Co-requisite: PHY 241.

Required materials:

Textbook – ATKINS' PHYSICAL CHEMISTRY, 11th Edition (2018), Peter Atkins, Julio de Paula, and James Keeler, Oxford University Press.

Spiral class notebook or binder with pockets.

Physical Chemistry is concerned with the fundamental concepts of chemistry as defined by its basic physical laws, many of which you have already been introduced to in General Chemistry. In this foundation course, we will expand upon prior knowledge by applying concepts of physics and using mathematical tools to explain and develop models for chemical behavior. We will focus on modeling basic macroscopic properties related to gas laws, thermodynamics, equilibrium, electrochemistry, solution chemistry, and kinetics. We will explain these macroscopic properties using microscopic models based on quantum mechanics and kinetic theory.

This first course in Physical Chemistry will serve as a stepping stone to the more advanced Chemistry courses taken by the junior and senior Chemistry and Biochemistry major.

In the syllabus you'll find...

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Learning outcomes	3
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Course grades	5
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How to Succeed

P. Chem. has the reputation of being tough because it combines chemistry concepts from earlier courses, pulls in some physics topics, and mixes it all with a heavy dose of math. While this sounds like a lot to digest, remember that with any big meal, you take it one bite at a time.

Organization and time management are keys to doing well in this class. To make sure that you have everything you need to succeed, all course materials – chapter learning objectives, PowerPoint presentation slides, videos, worksheets, and problem sets – are provided online through the Moodle course page. A schedule for each topic will list what needs to be reviewed and/or prepared for each period.

Keeping up with the material covered in class will allow you to participate fully and get the most out of the P. Chem. experience! Just remember, while you have to put forth a good deal of effort in order to perform well, you aren't doing it alone...

you alone

While you'll be supported in your efforts to do well in this class, ultimately it is you and you alone who is responsible for your final grade. Here is what you can do to succeed...

Read and take notes on all posted slides and textbook reading assignments and work any slide or other assigned problems in your notebook BEFORE class (refer to topic schedule). Your notebook will be stamped as you come into the classroom.

Identify any concepts that you're having difficulty understanding BEFORE class; write down these "Muddy Waters" questions so you can ask about them IN class.

Review information and do practice problems soon after the material has been covered in class.

NOTE: Most of the major concepts covered have a basis in Gen. Chem. I will not review that material – if you've forgotten it, I'll expect you to relearn it on your own.

your team

Class time will focus on teamwork. After you get your notebook stamped when you get to class, then you will join your team of 3-4 members. There you will work on assigned problems and/or worksheets. Also – don't forget to bring your calculator to class each period!

Teams will be asked to work out assigned problems and to discuss the meaning of their answers. Make sure that you're prepared to interact in class as participation will be one aspect of the course grade with team members periodically being asked to assess each other's level of participation in class and on projects.

Take full advantage of class time – this is where you can get your "Muddy Waters" questions answered and show me that you are trying your best.

the class

If most teams have the same questions, I will take the time to hold Q&A sessions during class. If you feel that you know how to explain a concept, don't be shy – you're always encouraged to express your ideas. It's okay if you're wrong – we learn from making mistakes and I'd prefer that you make mistakes in class and not on a test.

The best classes are those where the students support each other both in and out of class. We will start a GroupMe site where you can post questions and answers if help is requested.

While it's easy to get lost in the concepts and derivations, we need to make sure that we step back to see the big picture and to find out how P. Chem. concepts have real meaning in a variety of applications. We will, therefore, have a class project where we focus on the usefulness of the course concepts.

Instructor Office Hours

Dr. Hibbard's Office hours for Fall 2019 are as follows:

M	4:00 – 6:00 p.m.
W, R	11:00 a.m. – Noon
F	9:00 – 11:00 a.m.



or by appointment. *I will host tutoring sessions via Zoom on Sunday evenings if requested.*

Student Learning Outcomes

Upon successful completion of this course, the student will be able to:

1. Use quantitative methods and mathematical models to describe and analyze the properties and behavior of matter.
2. Apply critical thinking and scientific reasoning skills to solve problems related to physical chemistry.
3. Demonstrate a fundamental knowledge in thermodynamics, chemical kinetics, and quantum mechanics.
4. Read the chemical literature, comprehend the physical chemistry concepts described therein, and communicate knowledge effectively.
5. Enroll with confidence into more advanced chemistry courses, as required.

Learning Objectives

1. Compare and contrast ideal and real gas behavior based on the kinetic molecular theory and calculate various gas properties based on different equations of state.
2. Utilize the laws of thermodynamics and their associated mathematical relationships to determine properties of a system under various conditions, including determination of energy changes and prediction of spontaneity.
3. Analyze phase diagrams of pure substances in order to determine relevant information regarding phase conditions, phase transitions, and equilibrium.
4. Utilize thermodynamic relationships to analyze the properties of mixtures.
5. Demonstrate an understanding of chemical kinetics and its relationship to reaction mechanisms.
6. Demonstrate an understanding of the basics of quantum mechanical theory, how it was developed, and its application to simple atomic systems and spectroscopy.

Learning objectives for each chapter/topic covered are available on the Moodle course site. Objectives specify the essential concepts to be mastered for a given chapter and should be used as a guide when

Course Requirements

PREPARATION (500 points):

- Notebook (250 pts)
- Problems (250 pts)

Each student is expected to keep a **Notebook** in which they prepare worksheets and problems found in the online topic slides and those given as additional problem sets. The topic schedule will indicate the work to be prepared for each period. The notebook will be checked for completion at the beginning of each period and will undergo a more thorough evaluation at the end of the term.

Teams of 3-4 members will be formed the first week of class. Teams will work on problem sets, worksheets, and/or other group assignments each class period.

PARTICIPATION (400 points):

- Team in-class evaluations (100 pts)
- Instructor evaluation (50 pts)
- Team project (200 pts)
- Project evaluation (50 pts)

Teams will receive grades each period based on their responses to **problems** they work out in class. A maximum of 10 points can be earned by a team each period.

A **team project** will be assigned based on a real-world topic that can be discussed and analyzed using physical chemistry concepts. The class will decide on whether the project will be one on which the entire class works or if each team works on their own individual project. Final project outcomes and assessment will be decided by the class.

Each team member will submit a mid-term and final semester **team evaluation** to assess each member's level of in-class participation, including themselves.

Each team member will submit a **project evaluation** to assess the level of each team member's participation on the project.

EXAMS**(600 points)**

The class will decide during the first week whether there will be three (3) **exams** worth 200 points each covering at least two topics and/or textbook chapters OR if they want (6) 100-point individual topic exams. Exams will be announced at least one week in advance. In order to provide more time to take the exams, they will be administered outside of the class period during dates and times agreed upon by the class, with the exception of the last exam which will be administered on the last day of class during the normal class time.

Students will be allowed to bring a “cheat sheet” to each exam. The cheat sheet is a standard size sheet of paper (8½” x 11”) containing any information that you think will help you on the test. For a two-topic exam, the information on the cheat sheet can cover both front and back of the sheet.

Students will need to bring a calculator to the exams; sharing of calculators is not allowed. Use of a cell phone calculator function is prohibited. Calculators will be provided on exam days for those who forget their own.

Students will be able to improve upon a given exam score, if so desired, by taking a 15-minute **IQ (Improvement Quiz)** in class or online during the week after the test is given, with scores earned on the IQs replacing those scores earned on related problems from the original exam. IQ questions will not be identical to those from the exams but will be based on the same concepts.

Make-up exams will be given ONLY in the event of a documented illness or emergency if 3 exams are given. If the class decides on 6 exams, then one grade will be dropped and no make-ups will be given.

The instructor reserves the right to increase or decrease the number of exams given this semester.

FINAL EXAM**(500 points)**

A comprehensive **final exam** will be given on the date and time announced by the College. If the final exam is one which is developed by the instructor, then the student may bring a “cheat sheet” containing any information that can fit on one legal-sized sheet of paper (front and back.)

The instructor may instead elect to administer a timed ACS standardized exam (no cheat sheet and no calculator allowed.)

NO ONE IS EXEMPT FROM TAKING THE FINAL EXAM.

BONUS POINTS

Attendance at events such as seminars or Chemistry Club activities outside of class can accrue bonus points; pay attention to the Moodle course site during the semester and in-class announcements for extra credit opportunities (ECOs).

Bonus points will be added to overall point totals in determining the final grade.

Course Policies

ATTENDANCE

Regular attendance in lecture is essential for success. Since most class sessions involve group work, a team member's absence will be noted and will impact their participation grade.

Students arriving late to class will not be allowed to have their notebooks stamped or make up quizzes offered at the beginning of class.

Students arriving more than 30 minutes after the class has started may not be allowed to participate; this will be left up to the discretion of the teams and the instructor.

All cell phones must be silenced while in class.

It is strongly suggested that each student bring an electronic device (iPad, tablet, laptop, etc.) to class in order to be able to easily access course materials or look up chemical information as necessary.

DISABILITY ACCOMMODATION

Spelman College is committed to ensuring the full participation of all students in its programs. If you have a documented disability (or think that you may have a disability) and, as a result, need a reasonable accommodation to participate in class, complete course requirements, or benefit from the College's programs or services, you should contact the Office of Disability Services (ODS) as soon as possible. To receive any academic accommodation, you must be appropriately registered with ODS. The ODS works with students confidentially and does not disclose any disability-related information without permission. ODS serves as a clearinghouse on disability issues and works in partnership with faculty and all other student service offices. For further information about services for students with disabilities, contact the ODS at (404)270-5289 (voice) or visit the office in MacVicar Hall, Room 106.

ACADEMIC INTEGRITY

At the heart of Spelman College's mission is academic excellence, along with the development of intellectual, ethical and leadership qualities. These goals can only flourish in an institutional environment where every member of the College affirms honesty, trust, and mutual respect. Students are expected to read and abide by the Standards of Excellence Honor Code, and are expected to behave as mature and responsible members of the College academic community. Students are expected to follow ethical standards in their personal conduct and in their behavior towards other members of the community. They are expected to observe basic honesty in their work, words, ideas, and actions. Failure to do so is a violation of the Spelman College Academic Integrity Policy. Violators will be subject to the sanctions outlined in the Spelman College Bulletin.

NOTE: *This syllabus is intended to be a flexible document and may be amended by the instructor; any changes will be only to the benefit of the student.*

Course Schedule

Date	Topics	Text Chapter Topic/Sections
8/22	Course Introduction	
8/27	The Perfect Gas (1A) The Kinetic Model (1B)	1A.1, 1A.2 1B.1, 1B.2
8/29	Real Gases: van der Waals Gas (1C)	1C.2
9/3	Real Gases: Virial Equation (1C)	1C.1
9/5	Internal Energy: The First Law (2A)	2A.1, 2A.2, 2A.3
9/10	Enthalpy (2B)	2A.4, 2B.1, 2B.2
9/12	Thermochemistry (2C)	2C.1, 2C.2
9/17	State Functions and Exact Differentials (2D) Adiabatic Changes (2E)	2D.1, 2D.2, 2D.3, 2D.4 2E.1, 2E.2
9/19	Entropy (3A)	3A.1, 3A.2, 3A.3
9/24	Entropy Changes for Specific Processes (3B)	3B.1, 3B.2, 3B.3
9/26	Measurement of Entropy (3C)	3C.1, 3C.2
10/1	Helmholtz and Gibbs Energies (3D) Maxwell Relations (3E)	3D.1, 3D.2 3E.1, 3E.2
10/3	Phase Diagrams of Pure Substances (4A) Thermodynamics of Phase Transitions (4B)	4A.1, 4A.2, 4A.3 4B.1, 4B.2
10/10	Thermodynamics of Mixtures (5A)	5A.1, 5A.2, 5A.3
10/15	Properties of Solutions (5B)	5B.1, 5B.2
10/17	Phase Diagrams of Binary Systems – Liquids (5C) Phase Diagrams of Binary Systems – Solids (5D)	5C.1, 5C.2, 5C.3 5D.1, 5D.2, 5D.3
10/22	Activities (5E)	5E.1, 5E.2, 5E.3, 5E.4
10/24	Origins of Quantum Mechanics (7A) Wavefunctions (7B)	7A.1, 7A.2 7B.1, 7B.2
10/29	Operators and Observables (7C)	7C.1, 7C.2, 7C.3, 7C.4
10/31	Translation and the Particle-in-a-Box (7D)	7D.1, 7D.2, 7D.3, 7D.4
11/5	Vibration and the Harmonic Oscillator (7E)	7E.1, 7E.2
11/7	Rotation and Angular Momentum (7F)	7F.1, 7F.2
11/12	Atomic Structure and Spectra: Hydrogenic Atoms (8A)	8A.1, 8A.2
11/14	Atomic Structure and Spectra: Atomic Spectra (8C) Spectroscopy – General Discussion	8C.1
11/19	Rates of Chemical Reactions (17A)	17A.1, 17A.2
11/21	The Arrhenius Equation (17D) Reaction Mechanisms (17E)	17D.1, 17D.2 17E.1, 17E.2
11/26	Reaction Mechanisms (17E) - continued	17E.3, 17E.4, 17E.5
12/3	LAST DAY OF CLASS	

**CHE 421
INORGANIC CHEMISTRY**

**COURSE SYLLABUS
FALL 2019**

GENERAL INFORMATION

INSTRUCTOR:

Dr. Michelle Gaines

Office: 378 Science Center ♦ **Phone:** (404) 270 – 5743 ♦ **Email:** mgaines6@spelman.edu
Lab: 354 SCI

OFFICE HOURS:

M, W, F 10:00 a.m. – noon
or by appointment!

LECTURE:

M, W, F 9:00 a.m. – 9:50 a.m.

LOCATION:

SCI Room 145

COURSE DESCRIPTION:

This course provides a descriptive and quantum chemical examination of the structure, properties, bonding and chemical reactivity of inorganic compounds, with emphasis on transition metal coordination, organo-metallic and bioinorganic complexes. ***Credit Hours: 3***

REQUISITES

Prerequisites: Chem. 345, 346 for Option 1 (Graduate School) Chemistry and Biochemistry majors

Corequisite: Chem. 345 for dual degree majors

TEXTBOOK:

(primary)

Weller, et. al., Inorganic Chemistry,
7th ed., Oxford University Press, Oxford, UK, 2018.

(supplemental)

Chang & Goldsby, General Chemistry: The Essential Concepts,
7th ed., McGraw Hill, New York, NY, 2014

Zumdahl & Zumdahl, Chemistry, 8th ed.,
Brooks Cole, Belmont, CA, 2010

ONLINE MATERIALS:

Access Code Cards can be purchased online. Each student needs to register for the CHE 421 course at the following web address:
<http://www2.saplinglearning.com/>

Follow Instructions on Class Moodle Page to Register!

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COURSE OBJECTIVES

From the days of alchemists' attempts to convert base metals into gold, inorganic chemistry has enjoyed a prominent role in the study of science. The emergence of material science in the development and application of new technology has magnified this role. The roles played by metal-containing molecules in biological systems as well as the development of such compounds for treatment of cancer has further increased the profile of inorganic chemistry in recent years. Knowledge of inorganic chemistry is, therefore, of increasing importance to the modern scientist.

This course seeks to extend the student's knowledge of inorganic chemistry beyond the initial exposure in General Chemistry 111-112. It is designed to provide the advanced undergraduate with a balanced understanding of theoretical concepts, descriptive chemistry and current applications of inorganic chemistry.

LEARNING OBJECTIVES

The course is divided into two principle parts, the objectives of which are listed below.

Part I: Structure and Bonding

This section is a review of the atomic and electronic structure of atoms, the structure of and theories of bonding in simple covalent molecules. This section will also review and enhance the student's understanding of the structure and bonding in solids, with emphasis on metals and ionic compounds. Specific objectives to be reached by the student include

- An understanding of the quantum mechanical description of the electronic structure of atoms.
- Knowledge of the factors which influence such periodic properties as electronegativity, atomic and ionic size and ionization potential.
- The ability to describe the molecular structure and symmetry of covalent compounds and the bonding in such compounds using the valence bond and molecular orbital theories.
- The ability to describe and differentiate between metals, semimetals and insulators on the basis of their conductivity behavior and the use of the fundamental concepts of the molecular orbital (band) theory of solids.
- An understanding of the relationship between the composition and the structure of ionic compounds developed from the closest packing of spheres model.
- An understanding of the thermodynamics of ionic bond formation and the meaning of covalence in solid compounds, as reflected in the difference between observed and calculated lattice energies.

Part II: Compounds and Reactions

This section emphasizes the synthesis, characterization and reactions of simple and complex inorganic compounds. Included are descriptive discussions of industrially important nonmetallic substances and metal-containing compounds of academic, industrial and biological significance. The student will gain proficiency in the

- knowledge of the nomenclature, structure and bonding, spectroscopic behavior and reactions of transition metal coordination complexes and organometallic compounds.
- extension and application of the principles of coordination chemistry to the study of metals in biologically significant molecules such as chlorophyll, hemoglobin and vitamin B₁₂.
- application of the principles of organometallic chemistry to the understanding of metal-catalyzed industrial processes.

STUDENT LEARNING OUTCOMES:

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Upon successful completion of this course, the student will be able to:

- Apply critical thinking and scientific reasoning skills through making observations, gathering data, and analyzing facts in order to arrive at solutions to specific chemical problems.
- Work both individually and as a member of a team, which are valuable assets to any scientific profession.
- Demonstrate mastery of course concepts by satisfactory performance on exams, homework, and other summative assessments.
- Enroll with a high degree of confidence in the next level of Chemistry.

INSTRUCTIONAL METHODS:

Learning will occur through a combination of pre-class preparation, in-class lectures, team-based activities, and online assessments. All course material is located on the Moodle course page, which is divided into chapter topics.

Daily activities and chapter assignments are outlined in "**Course Schedule**." Students are expected to **prepare for class** by reading specific textbook chapter sections, completing homework assessments in Sapling, and working practice problems **in teams (see below)**. Class time will focus on explaining key concepts via lecture, problem-solving, and Q&A sessions with formative feedback.

Outside of class, learning will be reinforced with **Cooperative Learning, by working practice problems in Teams**, and completing online assessments via **Sapling**. Other learning resources (practice problems and YouTube videos) may be found on the course Moodle Page.

Cooperative Learning Teams for Practice Problem Sessions

- Should contain no more than four members per team, who can arrange to meet regularly, as permitted by the demands of their schedules.
- Should submit names and signatures of group members on an index card, along with an element identification name, such as the "Platinum Playazz" or the "Golden Girls".
- Should meet at least one hour per week to discuss homework problems, class notes, etc. and prepare **outside of class** to answer practice problem(s) during practice problem session.
- Should designate a (different) group leader prior to each session who will serve as **Manager, Recorder, & Reflector** for Thursday Practice Problem sessions.
- Should submit a one-page summary of each team discussion to Dr. Gaines, which contains the signatures of group members, location, time, date and topic(s) of discussion. **The summary must be submitted within one week of the date of the discussion.** (Hint: Sign the summary before adjourning the meeting and submit the summary at the next class meeting.)
- Will receive **10 extra credit points** per participating member added to the final grade for a **minimum of ten submitted summaries**. (Note: Multiple summaries submitted for a given 7-day period will be counted as one.)

CAUTION: Do not join a group unless you plan to contribute. Your teammates will not appreciate those who don't pull their weight and can, by a majority vote, exclude you from the team.

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COURSE POLICIES

CLASS ATTENDANCE & BEHAVIOR

Class attendance is required to achieve the maximum benefit from this course. When attending class, it is strongly recommended that students:

- Refrain from eating or drinking in class
- Turn OFF cell phones and personal entertainment devices
- Minimize conversations not related to this course
- Demonstrate active learning through *participation* in class discussion

Etiquette During Exams

- Students are **only** allowed to have pencils, erasers and calculators during examinations.
- Students are not allowed to share any of these implements during examinations.
- Cell phones calculators are prohibited in class or during examinations. All cell phones must be turned off and stored away during class.
- Refrain from wearing hats

LATE ASSIGNMENTS AND MISSED EXAMS

Late homework assignments will NOT be accepted after the due date (Connect/LearnSmart). Make-up exams will be given **by special permission only, and must fall in accordance with the Excused Absence Policy**. Foreseen circumstances such as extracurricular activities require written notice on official letterhead stationary signed by the faculty advisor / sponsor submitted in advance of the exam date. Unforeseen circumstances such as illness or family emergency require written documentation on official letterhead stationary from the infirmary or Dean's Office. **Documentation must be received within three class days of the absence.**

ACADEMIC HONESTY

All members of the academic community of Spelman College are expected to understand and follow the basic standards of honesty and integrity, upholding a commitment to high ethical standards. Students are expected to follow ethical standards in their personal conduct and in their behavior towards other members of the community. They are expected to observe basic honesty in their work, words, ideas, and actions. Any student found by the instructor to have engaged in academic misconduct will be assigned a grade of "F" for the course and may be subject to other sanctions outlined in the Spelman College Bulletin. Every student is responsible for reading and abiding by the Academic Integrity Policy.

ACADEMIC INTEGRITY

At the heart of Spelman College's mission is academic excellence, along with the development of intellectual, ethical and leadership qualities. These goals can only flourish in an institutional environment where every member of the College affirms honesty, trust, and mutual respect. All members of the academic community of Spelman College are expected to

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understand and follow the basic standards of honesty and integrity, upholding a commitment to high ethical standards. Students are expected to read and abide by the Spelman College Code of Conduct (see the current Spelman College Student Handbook) and are expected to behave as mature and responsible members of the Spelman College academic community. Students are expected to follow ethical standards in their personal conduct and in their behavior towards other members of the community. They are expected to observe basic honesty in their work, words, ideas, and actions. Failure to do so is a violation of the Spelman College Academic Integrity Policy. Violators will be subject to the sanctions outlined in the Spelman College Bulletin.

Some common violations of these basic standards of academic integrity include, but are not limited to:

- **Cheating:** Using or attempting to use unauthorized assistance, material, or study aids in examinations or other academic work, or preventing or attempting to prevent another from using authorized assistance, material, or study aids. (Examples: using a cheat sheet in a quiz or exam; programming a calculator or other electronic device with information for an exam, test, or quiz; soliciting information regarding an exam or test from another student; *altering a graded exam and resubmitting it for a better grade*, etc.)
- **Plagiarism:** Using the ideas, data, or language of another without specific and proper acknowledgment. Likewise, students may not use Internet source material, in whole or part, without careful and specific reference to the source. All use of the Internet must be thoroughly documented. Examples: misrepresenting another's work, (i.e., paper, lab report, article, or computer work) as one's own original creation and submitting it for an assignment; using someone else's ideas without attribution to source; failing to cite a reference or to use quotation marks where appropriate, etc.) The Writing Center, the Office of Undergraduate Studies web page, and departments provide guidelines to aid students in documenting source materials. *Internet plagiarism* includes but is not limited to submitting downloaded term papers or parts of term papers or articles, paraphrasing or copying information from the internet without citing the source, and "cutting and pasting" from various sources without proper attribution to source.
- **Fabrication:** Submitting contrived or altered information in any academic exercise. Examples: making up data for an experiment; "fudging" data; citing nonexistent or irrelevant articles; presenting fraudulent excuses, lies, letters of recommendations.
- **Multiple submissions:** Submitting, without prior permission, any work submitted to fulfill another academic requirement. Example: submitting the same paper for two different classes without the expressed consent of both professors.
- **Misrepresentation or falsification of academic records:** Misrepresenting or tampering with or attempting to tamper with any portion of a student's transcripts or academic record, either before or after enrolling at Spelman College. Examples: forging a registration form or a change of grade slip; forging signatures of advisors; falsifying information on an official document such as drop/add form, ID card or other college documents; tampering with computer records, etc.
- **Facilitating academic dishonesty:** Knowingly helping or attempting to help another violate any provision of this code. Example: working together on a take-home exam or other individual assignments, discussing an exam with a student who has yet to take it, giving tests or papers to another student, etc.

Unfair advantage: Attempting to gain unauthorized advantage over fellow students in an academic exercise. Examples: gaining or providing unauthorized access to examination materials (either past or present); obstructing or interfering with another student's efforts in an academic exercise; lying about a need for an extension for an exam or paper; continuing to write even when time is up during an exam; destroying, hiding, removing, or keeping library materials, etc.

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COPYRIGHT AND FAIR USE STATEMENT

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STUDENT ACCESS STATEMENT

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TECHNOLOGY USAGE POLICY

Use of cellphones, tablets, laptops, etc. during lecture time is not allowed **unless permission is given**. Such devices should be turned off so that they do not make sounds during class. Photos and video recording may not be taken during lecture without prior permission from the instructor.

TITLE IX

In compliance with Title IX, any personal conversations involving a Spelman student on topics related to sexual violence or harassment will not be held in confidence and will be reported to the appropriate office at the College.

IRB STATEMENT

The materials and scores that you generate in this class may be reported as part of a research presentation or publication in a professional journal or volume involving teaching and learning techniques. Although individual examples as well as group data may be reported, your identity and personal information will be kept confidential, so that you will not be identifiable to others. If you agree to have your work confidentially included in the report, please check the box below, sign this sheet, and return it to Dr. Winfield. Your decision about whether to permit this

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use of your scores will not affect your course grades in any way, nor will it change the work that is expected of you. You may withdraw your permission at any time before the data are presented. If you have any questions about this procedure, you may contact the Spelman College Institutional Review Board (IRB) at 404-270-5706 or irb@spelman.edu. Please note the IRB form for the complete disclosure.

COURSE GRADES

Course Grades are based on:

- **3 In-Class Exams, (60%) [600 points]:** multiple choice, short answer, word problems, chemical calculations
- **Sapling Online (Homework) (15%) [150 points]:**
<http://www.saplinglearning.com/ibisms/login>
- **1 Final Exam, (20%) [200 points]:** comprehensive, standardized
- **In-Class Participation [50 points]:** includes whether you are present and on time, tardy, or absent without an excuse

In accord with department standards, the following grade scale will be used:

A = 930 - 1000 points; A- = 900 - 929; B+ = 870 - 899; B = 830 - 869; B- = 800 - 829; C+ = 770 - 799; C = 700 - 769; D+ = 670 - 699; D = 600 - 669; F = < 600.

EXTRA CREDIT

There will be several opportunities to earn extra credit, throughout the semester. Extra credit opportunities will be announced in class. **The points earned will be tallied by Dr. Gaines and will be added to your final grade (out of 1000 points).** The maximum extra credit points will be available by the end of the semester will be ~10 - 15 points. Therefore, if your score for your final grade is 888 points (Letter Grade = B+), and you earn 15 extra credit points, your final score for your final grade will be 903 points (Letter Grade = A-).

FINAL EXAM

The **Final Exam** will be a standardized multiple choice test developed by the American Chemical Society (ACS) and will cover the main general chemistry concepts, covered during the semester. It will be held as a combined exam with the other CHE 421 lecture sections on a date and time during final exam week as scheduled by the instructors. As this is a timed exam, no student arriving more than 10 minutes late will be allowed admittance. The final exam will not be administered on any other day or time unless a student is verified as having more than two final exams scheduled on that same day. Once a conflict has been identified, please see the instructor as soon as possible. **NO ONE IS EXEMPT FROM TAKING THE FINAL EXAM.**

OTHER POLICIES

An Incomplete (IP) is assigned to a student when extenuating circumstances (e.g., illness, death of an immediate family member, or family emergency) prevent a student who is passing a course from completing the final examination or final assignment(s) by the end of the semester. In consultation with a Dean, the faculty member determines if an Incomplete is

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appropriate and completes the necessary paperwork. The faculty member determines the date for completion of all work. An Incompletion must be changed by the deadline specified on the College academic calendar. A student who cannot complete the Incomplete by the specified deadline must request an extension from the professor, who will notify the Office of the Dean of the extension. If the required work is not completed by the established deadline or the student is not given an extension, the IP will automatically be changed to an F.

ACADEMIC RESOURCES

CHEMISTRY LEARNING CENTER

Free tutoring is provided to all students through the **Chemistry Learning Center (CLC)**, located in **Science Center Room 348**. CLC tutoring times and days will be posted on the CLC door. The class will also have an assigned Teaching Assistant who will have tutoring hours in the CLC. All CLC tutors will be available to offer help and guidance as needed.

STUDENT ACCESS CENTER

The Student Success Center, located in McVicar Hall, Room 106, offers academic accommodations and services for all students with documented disabilities. For more information on available services, visit the website at <http://www.spelman.edu/student-life/health-and-wellness/student-access-center/overview>.

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COURSE OUTLINE & END-OF-CHAPER EXERCISES (Weller, et.al., 7th ed.)

NOTE: Course content may vary from this syllabus/schedule to meet the needs of this particular class. Students will be notified in class by the instructor when adjustments to this syllabus/schedule are required.

The following problems are assigned to help you understand and apply the concepts discussed in class. While no credit is given for doing the exercises, your ability to answer quiz and exam questions (which may be similar or even identical to the ones below) will be greatly enhanced if you work (minimally) as many, if not all, of these exercises as possible. **A more detailed breakdown of the topics, YouTube videos to supplement the in-class discussions and exercises to supplement those from the textbook, is available on Moodle.**

Topic	Dates	Reading (Chapter: Section)	Exercises (Chapter: Exercise)
Nuclear Structure/Reactions	8/26, 28, 30	CG 21:1-5	CG 21:6, 16, 31, 40, 51, 52, 58, 96a,c
Atomic Structure/Properties	9/4, 6, 9, 11, 13	1:1-7, 20:3, 20:8	1:1, 3, 6, 10-12, 18, 22, 25, 26, 28, 29; 20:12-14
Molecular Shape	9/16, 18, 20	2:1-3	2:1-6
Molecular Symmetry	9/23, 25, 27	3:1-5, 9	3:1-5, 9-11, Problems 3:1, 2, 4
Orbital Hybridization	10/1	2:4-6	2:19
Spaling Homework Due Dates	9/1, 8, 15, 22, 29		
Exam 1	10/4		
Molecular Orbital Theory	9/30, 10/2	2:7-10	2:14, 20-28, 31, 32
Metallic Solids	10/9, 11, 14, 16, 18	3:1-8, 3:18	4:3, 5, 712, 13, 47-50
Photovoltaic Cells Demo with D.A.T.E. Academy S.T.E.A.M. Team, October 18th			
Ionic Solids	10/21, 23, 25	3:11-17	4:15, 16, 19, 21, 26, 28, 30, 32, 35, 37, 42, 45
Lewis Acids and Bases	10/28	4:6-10	5:22, 24-28, 33, 38, 47
Coordination Chemistry: Nomenclature, Isomerism	10/30, 11/1, 11/4	7:1-14	7:1-5, 8, 9, 11-16, 19, 20; Problems 7:1-3, 12
Electrochemistry Demo with the D.A.T.E. Academy S.T.E.A.M. Team, November 1st			
Spaling Homework Due Dates	10/10, 17, 20, 24, 27, 11/3		
Exam 2	11/8		
Coordination Chemistry: Crystal Field Theory	11/4, 6	20:1	20:1, 3-6, 9, Problem 20.2
Substitution and Electron Transfer Reactions	11/8, 11, 13	21:1-5, 7-12	21:1, 3-6, 11-14, 16-19
Transition Metal (d-block): Organometallic Chemistry	11/15, 18, 20	22:1-15, 17-20	22:1-4, 6-8, 11, 14, 19, 27, 29
Catalysis	11/22, 25	22:21-26; 25:1-5, 9-12, 15, 18	24:39-41
(Cancer and cis-Platin		27:1	Supplemental Exercises on Moodle)
(Hemoglobin		26:7	Supplemental Exercises on Moodle)
Spaling Homework Due Dates	11/17, 24, 12/1, 3		
Exam 3	12/4		
ACS Standardized Exam	12/11	(10:30 AM - 12:30 PM; Location TBA)	

With the exception of the final exam, all exam dates are tentative and subject to change. **The last day to withdraw from this course and receive a grade of "W" is October 26, 2019.**

*****Note:** This syllabus is intended to be a flexible document, which may be amended by the instructor to the benefit the students.

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SPELMAN COLLEGE
Chemistry 421L
Inorganic Chemistry Laboratory
Fall, 2019

Instructor	Dr. Michelle Gaines
Office	378 Science Center mgaines6@spelman.edu ; (404) 270-5743
Office Hours	10:00 a.m. - 12:00 p.m. MWF
Lab Sessions	1:00 pm - 4:50 pm Mondays
Lab Manual	Available on Moodle
Required Items	Proper laboratory attire Bound lab notebook
Course Corequisites	CHEM 421

Attendance

Make-up labs will not be scheduled. Should a student miss an exercise due to illness, family emergency or official College activity (including job or graduate/ professional school interviews), proper documentation on official letterhead stationary must be supplied to Dr. Gaines. Documentation will be accepted prior to official activities and no later than one class day after the absence has taken place. The schedule of experiments (see below) contains limited flexibility in allowing a student to perform a missed exercise. Consult with Dr. Gaines prior to performing a missed exercise to insure that conflicts with other students do not occur.

Students should make a special effort to be on time for scheduled lab sessions. **A student will be penalized 10 points on her report grade for being more than 5 minutes late for a session and without a valid excuse.**

When attending class it is strongly recommended that students refrain from wearing hats (even on bad hair days) and turn off cell phones and other electronic devices. Proper attire for the laboratory environment is required.

Evaluation

Each of the 11 submitted assignments (lab reports and Sapling assignments) in this course will account for 8% of the course grade for Chemistry 421L. A comprehensive final exam will account for the remaining 12% of the course grade. Separate grades for Chemistry 421 and 421L will be given. In accord with Department standards, the following grade scale will be used.

A = 930 - 1000 points; A- = 900 - 929; B+ = 870 - 899; B = 830 - 869; B- = 800 - 829; C+ = 770 - 799; C = 700 - 769; D+ = 670 - 699; D = 600 - 669; F = 0 - 599

An Incomplete (I) grade will be given if a student completes a majority of the course requirements and has obtained a valid written excuse from the Dean's office indicating why the outstanding course requirement(s) cannot be completed by the close of the semester. The outstanding requirement(s) must then be completed by the date (March 21, 2017) indicated by the Registrar's office. Otherwise a course grade of "F" will be given.

Academic Honesty

At the heart of Spelman College's mission is academic excellence, along with the development of intellectual, ethical and leadership qualities. These goals can only flourish in an institutional environment where every member of the College affirms honesty, trust and mutual respect. All members of the academic community of Spelman College are expected to understand and follow the basic standards of honesty and integrity, upholding a commitment to high ethical standards. Students are expected to read and abide by the Spelman College Code of Conduct (see the Spelman College Student Handbook) and are expected to behave as mature and responsible members of the Spelman College academic community. Students are expected to follow ethical standards in their personal conduct and in their behavior towards other members of the community. They are expected to observe basic honesty in their work, words, ideas and actions. Failure to do so is a violation of the Spelman College Academic Integrity Policy. Violators will be subject to the sanctions outlined in the Spelman College Bulletin.

With respect to this (or any) laboratory experience, record what you (and your lab partner, if applicable) observe, not what someone else observed or what you think you should have observed. Although data may be collected with a partner, its interpretation and reporting should be done by the individual student.

Disability Services

Spelman College is sensitive to the special needs of students with disabilities. Any student who feels she may need an accommodation based on the impact of a disability should contact the Office of Disability Services privately to discuss her specific needs. Please contact the Office of Disability Services at 404-270-5289 in Mac Vicar Hall to coordinate reasonable accommodations.

Pregnancy Statement

The College recommends that any student who is pregnant and enrolled in any laboratory and/or physical activity get written permission from her attending physician before participating in any laboratory and/or physical activity for the course. Please refer to the Student Handbook for the College's policy statement on Students with Serious Medical Conditions. Instructors will provide all students with a syllabus outlining the experiments performed during a semester and Material Safety Data Sheets will be made available for any hazardous materials used during the course.

Course Overview

The laboratory portion of Chemistry 421 is designed to familiarize the advanced undergraduate student with the preparation, characterization and chemical behavior of inorganic compounds. Students will examine the behavior of elements in three families of the periodic table and the structure and bonding of transition metal compounds.

Laboratory Safety and Housekeeping

It is imperative that safety and good housekeeping procedures be practiced in the performance of experiments. Those procedures include the following:

• EYE PROTECTION AND PROPER ATTIRE IS MANDATORY WHILE WORKING IN THE LAB. NO STUDENT WILL BE PERMITTED TO WORK WITHOUT EYE PROTECTION AND PROPER ATTIRE.

- Upon completion of lab procedures, all equipment, including the balances in the balance room, must be cleaned and returned to its proper storage place. A

10-point penalty will be assessed each time that glassware or equipment is left dirty and/or out of place.

Pre-Lab Summary

Prior to attending a laboratory session, each student must prepare a summary of the investigation to be performed. This will be included in the lab notebook. The summary will include a brief explanation of the purpose for the lab, objective(s), hypothesis(es), and introduce laboratory techniques and methodologies that will be used to determine your desired results. Also include room for information tables (by section) to be filled in with descriptive observations and numerical data obtained, during the course of the investigation. The summary will be presented to the instructor for his signature prior to performance of the lab exercise. **No one will be allowed to work in the laboratory without a signed summary.**

Laboratory Notebooks

A bound notebook serving as a record of experiments performed must be kept and will be checked upon completion of each laboratory session. Entries must be made in permanent ink since pencils and some markers smear when wet. Entries should be made as the experiment is being performed and must be dated and witnessed by the instructor at the end of the lab period. **No credit will be given for lab reports written with data that has not been witnessed.**

Reports

Lab Reports are due 2 weeks after the lab was completed (see below). Reports must be submitted on Moodle by 11:59 p.m. on the day of lab. A late report will be penalized 10 points per day that it is late. No credit will be given for a report submitted later than three days after it is due. Reports should be typed and should include any graphs or figures. Reports should be concise and follow the following format.

Objective Statement - 5% of Grade

Theory or Background - 10% of Grade

Experimental Procedures - 10% of Grade

Data and Observations - 20% of Grade

Results and Discussion, Answers to Post-Lab Questions - 55% of Grade

Additional information regarding this format may be found in the handout entitled "Laboratory Safety, Housekeeping, Notebooks and Reports" on Moodle.

List of Experiments

- A. Chemistry of the Halogens and Their Compounds
- B. Chemistry of Nitrogen and Its Compounds
- C. Chemistry of Sulfur and its Compounds
- D. Structure of Solids
- E. Complex Ion Composition by Job's Method

Laboratory Schedule

Date	Exercise to be Performed	Report to be Submitted
8/19		
8/26	ACS Inorganic Pre-Test	
9/9	Lab Orientation/Safety/Pretest	
9/16	Electrochemistry lectures	
9/23	Electrochemistry lectures	
9/30	NO LAB, TODAY	Sapling Redox Assignment 1
10/7	Fall Break	Sapling Redox Assignment 2
10/14	Halogens	
10/21	NO LAB, TODAY	
11/4	Nitrogen	Halogens, No Report Due
11/11	Sulfur	Nitrogen
11/18	Solids	Sulfur
11/25	Job's Method	Solids
12/2		Job's Method

Oxidation-Reduction Topics, Schedule and Assignments

Date	Topic(s)	Text Reading	Video(s)	Text Exercises	Supplemental Exercises
9/16 #1	Balancing Redox Equations	CG 19.1	EL1, EL2	CG19.2	
9/16 #2	Cell Potential, Galvanic Cells and Free Energy	CG 19.2-19.4 (Weller 5.1 - 5.5)	EL3-EL8	CG19.12, 16, 18, 22, 24, 30, 32, 88, 94	
9/23 #1	Latimer and Frost Diagrams	Weller 5.12, 5.13		Weller 5.9, 5.13 -15, 5.20	
9/23 #2	Corrosion and Electrolysis	CG19.7, 19.8	EL9-EL11	CG19.42, 117	

CG = Chang and Goldsby, "General Chemistry, The Essential Concepts", 7th ed.
 Weller = Weller, et. al., Inorganic Chemistry, 7th ed.

Spelman College
Department of Chemistry and Biochemistry
GENERAL CHEMISTRY 112 LABORATORIES
Syllabus
Spring 2019

INSTRUCTORS/ Office hours	SECTION	ROOM	OFFICE	PHONE	E-MAIL
Dr. Marisela Mancia MWTh F: 2:00-3:00pm T: 9:00-11:00am	M 6:00pm-7:30pm Exams	SC 134	SC 377	404.270.5852	mmancia@spelman.edu
Dr. Dulma E. Nugawela MTW: 1:30-3:30pm	1 – T 8:00:10:50 am CRN: 11217	SC 158	SC 376	404.270 5740	dnugawel@spelman.edu
Dr. Marisela Mancia MWTh F: 2:00-3:00pm T: 9:00-11:00am	2 – R 8:00:10:50 am CRN: 11218	SC 158	SC 377	404.270.5852	mmancia@spelman.edu
Dr. Elina V. Stroeve Before the lab/Dr. Mancia	3 – W 6:00-8:50 pm CRN: 11219	SC 158	SC 149	e-mail	estroeve@gsu.edu
Mr. Saki T. Golafale Before the lab/Dr. Mancia	4- T 6:00-9:00 pm CRN: 11220	SC 158	SC 149	e-mail	saki.golafale@students.cau.edu
Dr. Marisela Mancia MWTh F: 2:00-3:00pm T: 9:00-11:00am	5- T 1:00-3:50 pm CRN: 12948	SC 158	SC 377	404.270.5852	mmancia@spelman.edu
Dr. Dulma E. Nugawela MTW: 1:30-3:30pm	6- R 6:00-8:50 pm CRN: 91122	SC 158	SC 376	404.270 5740	dnugawel@spelman.edu
Mr. Saki T. Golafale Before the lab/Dr. Mancia	7- R 1:00-3:50 pm CRN 92236	SC 158	SC 149	e-mail	saki.golafale@students.cau.edu

LABORATORY COURSE DESCRIPTION:

The General Chemistry 112 laboratory course is the second semester lab course in the general chemistry sequence and is to be taken concurrently with the General Chemistry 112 lecture course. Experiments will be performed that are based on the topics discussed in lecture. The goal of the lab course is to ensure that students understand how chemical concepts are discovered and used to analyze and evaluate experimental data.

LABORATORY REQUIREMENTS: (course text & materials)

- (a) General Chemistry Laboratory Manual (2018); ISBN: 9781323867150 by Pearson; **(required)**
- (b) Hayden-McNeil carbonless/duplicate set- Student lab notebook **(required)**
- (c) Chemical splash –resistant Safety Goggles. **(required)**
- (d) Lab coats or aprons, and gloves are **optional**.

PRE- and CO REQUISITES:

Students must have passed **both** Chemistry 111 and 111L with a grade of a C or higher in order to enroll in Chemistry 112L. Chemistry 112 lecture is a **corequisite** unless the student has already passed it. Pre-calculus 2 (MAT 116), Accelerated Pre-Calculus (MAT 120) or a higher level math course is a **corequisite** unless the student has already passed such a course.

GCHEM LAB COMMONS COURSE PAGE/MOODLE WEB PAGE

Laboratory readiness is a critical part of the lab experience. *Weekly laboratory Pre-lab information will be posted in the General Chemistry Laboratory Commons laboratory course Spel.eLearn (moodle) web page.* These weekly summary slides describe the upcoming laboratory experiments. Lab procedures, techniques, instrumentation usage, data collection, and data analysis will be discussed so that the student will be familiar with what is expected in the lab the following week. Two of the 6:00-7:30 pm (**recitation period**) dates are for the departmental laboratory mid-term and final exams to be administrated to all students.

LABORATORY GOALS:

Upon successful completion of the laboratory course a student will be able to:

1. Make observations, gather data, examine and analyze facts, and **arrive at solutions to problems in an experimental laboratory setting.**
2. Demonstrate **mastery of the chemical concepts** learned through the General Chemistry laboratory and lecture sequence (CHE 111 and CHE 112) by satisfactory performance on lab reports, quizzes and examinations.
3. Analyze and apply scientific knowledge and critical thinking skills throughout the laboratory exercise, and **demonstrate knowledge and scientific literacy** through effective written communication by satisfactory performance on **laboratory reports.**
4. Demonstrate a **mastery of basic laboratory skills,** learned through the laboratory sequence by independently being able to: set up equipment and apparatus, make solutions, operate small instruments and perform laboratory exercises. Satisfactory performance will be evaluated by experimental settings, random checks, and a laboratory practicum exam.
5. Enroll with a high degree of **confidence and knowledge** in higher level chemistry laboratory courses.

LABORATORY INFORMATION AND POLICIES:

Information regarding each lab experiment will be made available on the Spel.elearn (moodle) General Chemistry 112L commons course page. Each student who has enrolled in the recitation and laboratory should have access to these commons pages.

Students are expected to complete the pre-lab exercises and review questions before each lab and should check

each week for any additional questions, review slides, and assignments posted on *Spel.elearn (moodle)*. In addition, supplementary information regarding each experiment, such as a change in the experimental procedure, will be posted on the *Spel.elearn (moodle)* course page.

SAFETY:

During the first lab period (**week of January 22, 2018**), students are required to attend a safety lecture pertaining to the chemistry lab. **While in the laboratory, safety goggles must be worn at all times.** Safety "glasses or spectacles", along with prescription glasses are not allowed because they do not provide adequate splash protection. Students must wear goggles, even if they wear prescription lenses. Contact lenses are strongly discouraged but can be worn only if goggles are worn. **Anyone attempting to perform an experiment without safety goggles will be dismissed from the lab and receive a grade of zero for that lab report.**

PRE-LAB:

Before coming to the laboratory to perform a given experiment, the student is expected to have reviewed the recitation, read the experiment thoroughly, and to have written the following into the lab notebook:

(1) student's name and name of lab partner at the top of the first page for that lab; (2) title and date of the experiment, (3) a brief statement on the purpose of the experiment, (4) an outlined procedure (*including any announced procedural changes*). These sections will correspond to the first part of the laboratory report. The instructor or teaching assistant will initial the student's notebook at the beginning of the period to indicate that the purpose and procedure have been entered.

The **Lab Notebook** should be kept up-to-date and in traditional scientific format.

The instructor will dismiss any student who comes to lab without a pre-lab from the laboratory. That student will then receive a grade of zero for that lab report.

LAB PERIOD:

During the first **few minutes** of the lab period, the instructor will give a quiz pertaining to the day's experiment based on the materials the students were assigned to read to prepare for the lab. One quiz grade will be dropped in determining the final quiz average. **Quizzes are worth 5% of your final grade.**

At the beginning of the laboratory period, students will turn in a copy of the lab report from the previous lab. That report must be an original document that was written entirely by that student alone.

Students will work either individually or in pairs and will be assigned a given bench space. Each student is expected to collect data in their own notebook and have the data section initialed by the instructor after the lab has been completed. This information will be written under the heading (5) collected data.

Cell phones/ technologies: All cell phones/technologies (iPads, smart phones, various music players, web books, laptops, etc. must be silenced from vibration and audible sounds) are to be turned off and stored with personal belongings at all times during the laboratory period. **Texting is not permitted during the laboratory period.**

Students using cell phone during a lab may be asked to leave and the missed lab may be counted as an unexcused absence.

- These devices cannot be utilized (i.e. used as a timepiece or a calculator) during exams and quizzes and should not be visible at any time during the lab.
- Absolutely no headphones or earpieces (with the exception of hearing aids) can be worn, whether they are on or off, at any time during the lab or during the exams.
- **Use of these devices during an exam or quiz will be regarded as Academic Dishonesty and a grade of zero will be given for the assessment.**

Students arriving 15 minutes late to lab will not be allowed to take the quiz, perform the experiment and will receive a zero for the corresponding report. No visitors are allowed during the lab period.

CLEANUP RESPONSIBILITIES:

Each week, students will be assigned the following tasks: (a) checking that all community glassware has been cleaned and returned to the appropriate location, (b) wiping all benchtops with a sponge and water, (c) ensuring that bench sinks remain clear of chemicals and trash and, (d) cleaning of any chemical spills in or around the balances. Any reports by faculty, staff or students in the following lab period of unclean glassware or spilled chemicals that were not cleaned up will result in a 10-point deduction in the lab reports of those students in that group.

LAB REPORTS:

Lab Reports are due one week after completion of the lab experiment. A report is to be submitted by each student for each experiment. Stapled laboratory reports are due at the beginning of the lab period (first 15 minutes) **late laboratory reports will not be accepted or graded (9 lab reports, 100 points each) (50%).**

The lab report will consist of the following sections:

(1) student's name and name of lab partner, clearly indicated; (2) title and date of the experiment, (3) a brief purpose, (4) an outlined procedure (*including procedural changes*), (5) collected data, (6) calculations & results (7) final results in a Discussion & Conclusion Format (8) answers to post-lab questions that have been assigned for that lab. The methods used in the calculations should be described in section (6) using examples. The final results should include any relevant discussion. **For more information, refer to the Laboratory Reports Handout.** Reports must be stapled and are due at the beginning of the following lab period. The lowest lab report grade will be dropped at the end of the term. If you miss a lab for any reason, that lab will probably be your dropped grade.

Students are not allowed to make up missed lab experiments in another section due to safety considerations. If a student misses more than one lab period due to extended illness (an excuse from the Office of Undergraduate Dean is necessary), death in the family, or other emergency that is officially recognized and excused by the Academic Dean, arrangements may be made for the student to write-up a report for the missed experiment.

EXAMS:

Two lab exams will be administered collectively (in **SCI 134** for all sections) during the **recitation period (Monday 6:00-7:30pm)** on the dates indicated in the Course Schedule below. The first exam will cover experiments 1-4, (15%) and the second exam will cover experiments 5-8 (20%). ***Students are not allowed to make-up missed lab exams.***

You are not permitted to leave the room during an exam. When you leave the room, your exam time will end. **Use the restroom before the exam.**

LAB PRACTICUM:

An end-of-term lab practicum exam will be administered on the dates indicated in the Course Schedule below. The lab practicum which tests student knowledge of techniques, lab procedures, and basic chemistry, has been introduced during the lab course sequence (10%).

This course is departmentally coordinated. To keep consistency across the sections, the following represents how a final grade will be determined for each student:

COURSE GRADING SCALE:

Quizzes (one drop)	5%
Laboratory Reports (one drop)	50%
Exams (2 total no drop, no replacement)	35%
Lab Practicum (no drop, no replacement)	10%

Per Department standards, letter grades will be assigned according to the following grade scale:

93-100	A	77-79	C ⁺
90-92	A ⁻	70-76	C
87-89	B ⁺	66-69	D ⁺
83-86	B	60-65	D
80-82	B ⁻	Below 60	F

INCOMPLETE:

A grade of incomplete (I) will be given only in extreme cases where a student has completed the majority of the work in the course and has an excuse from the Dean indicating a legitimate reason why the course work cannot be completed by the end of the semester. The student must complete the required course work by the date indicated by the Registrar's office for the next semester. If the student has not done so, the *I* will be replaced by an *F*.

CHE 231 and 233L – Organic Chemistry:

A minimum grade of C must be earned in *both* the CHE 111 and 112 lectures and laboratories in order for a student to advance to the Organic course. A student failing lecture but passing lab may repeat the lecture course without repeating the laboratory (and vice-versa.) If a student does not earn a grade of C or better in either the lab or the lecture, that course must be repeated before the student is allowed to enroll in organic chemistry.

ACADEMIC HONESTY:

All members of the academic community of Spelman College are expected to understand and follow the basic standards of honesty and integrity, upholding a commitment to high ethical standards. Students are expected to follow ethical standards in their personal conduct and in their behavior towards other members of the community. They are expected to observe basic honesty in their work, words, ideas, and actions. Any student found by the instructor to have engaged in academic misconduct on a graded test, assignment, or examination is in violation of the Spelman College Academic Integrity Policy and will be assigned a grade of "F" for the course and may be subject to other sanctions outlined in the Spelman College Bulletin. (ACADEMIC INTEGRITY POLICY on Spel.eLearn (class webpage)). Every student is responsible for reading and abiding by the Academic Integrity Policy. Again, violators will be subject to the sanctions outlined in the Spelman College Bulletin.

STUDENT ACCESS STATEMENT:

Spelman College is committed to ensuring the full participation of all students in its programs. If you have a documented disability (or think you may have a disability) and, as a result, need a reasonable accommodation to participate in class, complete course requirements, or benefit from the College's programs or services, you should contact Student Access Center (SAC) as soon as possible. To receive any academic accommodation, you must be appropriately registered with SAC. The SAC works with students confidentially and does not disclose any disability-related information without their permission. SAC serves as a clearinghouse on disability issues and works in partnership with faculty and all other student service offices. For further information about services for students with disabilities, please contact the SAC at 404-270-5289 (voice), located in MacVicar Hall, Room 106.

Please note all notifications from the Office of Disability Services must be submitted to your laboratory Instructor a week prior Lab Exam I to receive suggested accommodations.

PREGNANCY STATEMENT:

The College recommends that any student who is pregnant and enrolled in any laboratory and/or physical activity get written permission from her attending physician before participating in any laboratory and/or physical activity for the course. Please refer to the Student Handbook for the College's policy statement on Students with Serious Medical Conditions.

Instructors will provide all students with a syllabus outlining the experiments performed during a semester and Material Safety Data Sheets will be made available for any hazardous materials used during the course.

TITLE IX STATEMENT

Students, should note that certain sensitive conversation (shared online or in person) involving violence, emotional instability, or harassment of any kind cannot be held in confidence and must be reported in accordance with Title IX regulations. The Title IX Officer is responsible for coordinating the College's compliance with Title IX, including overseeing all complaints of sex discrimination, including sexual violence, and identifying and addressing any patterns or systemic problems that arise during the review of such complaints. Contact information for Title IX representatives can be found on the course Moodle site and on the Spelman website at <http://www.spelman.edu/title-ix>

Spelman College
Department of Chemistry and Biochemistry
CHE 112L – Spring 2019
Laboratory Schedule

Lab Periods/ Recitation	Laboratory Exercise	Source: Moodle page & lab Manual
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Jan. 21 (M, 6PM)	MLK Holiday (no classes)	
Jan. 22-24	Laboratory Safety, Laboratory Notebooks & Reports Safety quiz and laboratory equipment quiz	Docs @ Moodle page lab manual pp:1-10; 275-279
Jan. 29-31	1. Atomic Spectra	Docs @ Moodle page
Feb. 5-7	2. Introduction to Qualitative Analysis I	Moodle & Lab manual pp TBA
Feb. 12-14	3. Qualitative Analysis (unknown)	Moodle & Lab manual TBA
Feb. 19-21	4. Vapor Pressure of Water	Moodle & Lab manual pp TBA
Feb. 26-28	5. Spectrophotometric Analysis of Commercial Aspirin	Docs @ Moodle page
Mar 4 (M, 6PM)	Exam I review (Labs 1-5)	
Mar. 5-7	6. Freezing Point of Depression	Moodle & Lab manual pp TBA
No experiments will be performed during March 11-15, Spring Break		
Mar 18 (M, 6PM)	EXAM I on Laboratories 1-5	
Mar. 19-21	7. Rates of Chemical Reactions I	Moodle & Lab manual pp TBA
Mar. 26-28	8. Determining an Equilibrium Constant	Docs @ Moodle page
Mar 29 (F, 5PM)	Last day to Withdraw from the course	
Apr. 2-4	9a. Titrations of Acids & Bases	Moodle & Lab manual pp TBA
	9b. pH of Buffer Solutions	Moodle & Lab manual pp TBA
Apr. 9-11	Founder's day (April 11)	
Apr. 16-18	Practicum Exam	(lab report #8 due all sections)
Apr. 22 (M, 6PM)	Exam II review (Laboratories 6-9)	(lab report #9 due all sections)
April. 29 (M, 6PM)	EXAM II on Laboratories 6-9	

TENTATIVE EXAM SCHEDULE

EXAM	DATE	EXPERIMENTS COVERED
I	Monday, March 18	1-5
II	Monday, April 29	6-9

GENERAL CHEMISTRY II – SCHE 112L COURSE SYLLABUS
DEPARTMENT OF CHEMISTRY & BIOCHEMISTRY – Spring 2019

This agreement of understanding should be completed only after reading the syllabus and course schedule. Initial each understanding. Sign and date.

1. I understand the standards in this course and that I am responsible for monitoring my own learning.

2. I understand that I am responsible for being prepared for class each time the class meets. This responsibility includes, but is not limited to having a lab manual and a lab notebook. I am also required to complete assignments, to wear safety goggles and safe attire in the laboratory.

3. I have read the Academic Integrity policy and will not engage in any form of academic dishonesty in this course. I understand the consequences of violating the academic integrity policy of the college.

4. I understand the attendance requirements and penalties for being late to class.

5. I understand when assignments are due and the penalties for late work.

6. I understand that I should ask questions and seek assistance from the instructor when I do not understand course content or requirements.

7. I understand how final grades will be determined.

8. I understand that the work of the course requires consistent classroom attendance and active participation.

9. I have read and understand the basis of letter grade evaluations.

10. I understand that the instructor is available to answer questions, help me grasp the material, and support my work in the course during regular office hours, by appointment, and by e-mail.

11. I understand that with prior student notification, the instructor reserves the right to make any modifications to this syllabus as circumstances dictate to facilitate the instruction of this course.

Name: _____

Print

Signature

Date: _____

**CHEM 112L – Spring 2019
Student Information**

Name _____

Student # _____
(only if not registered for the course)

College _____

College PO box _____

Major _____

Local address _____

Local or cell phone _____

Permanent address _____

Permanent phone _____

e-mail address (Spelman e-mail if Spelman student)

Please sign the following statement. An incorrect course acknowledgement will be reported as an Academic Integrity Violation.

(1) I have passed Chem111 and Chem111L with at least a grade of C. I have fulfilled the math prerequisites or corequisites for this class. (2) I am currently registered for Chem112, or I have already passed Chem112 with a grade of C or higher (underline which one applies).

Signature