

SYLLABUS

CHEMISTRY 105

SPRING 2017

LECTURES: MWF 11:10AM and 2:10PM

Fulmer 226

INSTRUCTOR: Dr. Michael Finnegan Fulmer 30A 335-5692 mgfinnegan@wsu.edu

Office Hours: 3:15-4:15PM every weekday.

GENERAL CHEMISTRY OFFICE: Nikki Clark Fulmer 319A 335-1516 nikki_clark@wsu.edu

LABORATORY SUPERVISOR: Ryan Rice Fulmer 313 335-6358 rwrice@wsu.edu

GRADING:	3 "midterm" exams	300	GRADE RANGES: (minimum points to achieve)		
	Homework	100	900 points	A	740 points C+
	Reading Assignments	100	870 points	A-	700 points C
	In Lecture Assignments	100	840 points	B+	670 points C-
	10 laboratory experiments/worksheets	150	800 points	B	640 points D+
	Knewton Adaptive Learning Beta	50	770 points	B-	600 points D
	Final Exam	<u>200</u>			Less than 600 points: F
	TOTAL	1000			

MIDTERM EXAMS: Thursday Feb 9 6:00– 7:00 pm (Chapters 1-4+ Lab WS #1 & Expts 1 & 2)

Thursday March 9 6:00– 7:00 pm (Chapters 5-7.3 + Experiments 7, 3, & 6)

Thursday April 13 6:00– 7:00 pm (Chapters 7.4-9 + Experiments 4, 10, & 9)

FINAL EXAM Monday May 1 7:00pm–8:50 pm (Comprehensive: ACS standard exam)

TEXT: *Principles of Chemistry: a Molecular Approach, 4th Ed.* by Nivaldo J. Tro, Pearson education (2017).

ISBN: 978-0-13-411283-1 or 978-1-323-45432-9 (WSU custom cover). The text and access to the Mastering Chemistry homework site are required. The bookstores have new texts bundled with a modified Mastering Chemistry access code. Modified Mastering Chemistry access codes can also be purchased separately via the MasteringChemistry link on the blackboard course site.

LAB TEXT: *Chemistry 105 General Chemistry Laboratory Manual* by WSU Chemistry Department, Star Publishing (2016) is required to complete the laboratory portion of this course.

LABORATORY NOTEBOOK: Duplicating with numbered pages. (Sold in Fulmer 318 the 1st and 2nd week of class.)

GOGGLES: Required by State Law. (Sold in Fulmer 318 the 1st and 2nd week of class.)

LABORATORY COAT: Optional but recommended. A strict dress code is enforced in the laboratories. NO SHORTS, NO SHORT SKIRTS, NO SANDALS, NO BARE MIDRIFTS. (See laboratory dress code.)

CALCULATORS: You are expected to have and to be able to use a scientific calculator. Graphing calculators are allowed but not required. The use of any stored information/programs in a programmable calculator will be considered cheating. Calculators with a full keyboard (such as the TI-92, TI-nspire or Voyage 200); PDAs; palmtop, laptop and handheld computers; and/or cell phone/calculator combinations may not be used during examinations. You are responsible for bringing your calculator to all tutorials, lectures, labs and exams.

ONLINE COMPONENTS: We will be using Blackboard Learn for course management and online information. This can be accessed via <https://learn.wsu.edu>. Use your WSU network ID and password to log in. All online aspects of the course including homework sets (MasteringChemistry), reading assignments (MasteringChemistry), In Lecture Assignments (Learning Catalytics), and Adaptive Learning Assignments (Knewton) should be accessed via the links on the Blackboard site. All e-mail communications to the course instructor and TAs should be via the Blackboard mail tool. Confidential information such as scores and grades may not be transmitted via unsecured email.

READING ASSIGNMENTS: There will be reading assignments due before each lecture starting with the Wednesday, January 11th lecture (lecture #1). These consist of assigned sections of the text and questions intended to evaluate your understanding of this material. The reading assignments are available on the MasteringChemistry site which should be accessed via the Blackboard course site. Each assignment must be completed by 2:00AM on the day of the associated lecture. Each reading assignment is worth 4 points. Your score will be determined by multiplying your percent correct by 4 and rounding to the nearest ½ point. 164 points will be available from the reading assignments this semester (41 reading assignments × 4 points). A maximum of 100 points from the reading assignments will count toward the course grade. A portion of any reading assignment points obtained in excess of 100 points might be counted as extra credit at the end of the semester. It is important to note that the completion of these assignments is independent of lecture attendance. If you are sick or out of town, it is still possible to complete the assignments.

LECTURES: Lectures must be attended on a regular basis. You will be expected to read the textbook AHEAD of coming to class. Lectures will supplement and clarify the information from your text rather than reiterate it. Lectures will focus on problem solving and demonstrations of chemical reactions. There will be in-lecture problem assignments via the LearningCatalytics website (accessible via the course Blackboard site). These will be graded and counted towards your total point score. *Bring a calculator and web-enabled device to all lectures.* You are encouraged to form collaborative study groups and to sit with your group members during lecture.

IN-LECTURE ASSIGNMENTS: All lectures will include problem assignments via the LearningCatalytics website (accessible via the course Blackboard site). These assignments will be identified as “In-Lecture Assignments” in the grade book. These sessions are interactive and will require a Wi-Fi enabled device such as a smart-phone, laptop, or tablet. Each in-lecture assignment will be worth 5 course points and will be graded on both participation (50%) and correctness of answers (50%). There will be 205 points available from in-lecture assignments. A maximum of 100 points from the in-lecture assignments will count toward the course grade. A portion of any in-lecture assignment points obtained in excess of 100 points might be counted as extra credit at the end of the semester. Each in-lecture assignment will be available only during a portion of the associated lecture. There will be no make-up opportunities for in-lecture assignments. If you are not present for lecture for any reason, you will not have the opportunity to get those 5 points. If your Wi-Fi device fails during the assignment, you will not have an opportunity to get the points for the portion of the assignment you are not able to complete. Make certain that the batteries are fully charged before arriving for lecture.

HOMEWORK: There will be weekly homework assignments. These assignments are administered by Mastering Chemistry and accessed through the course Blackboard site. You should have an access code for Mastering Chemistry bundled with your text. Please follow the attached instructions and use the access code to register for the system. If you purchased a text that did not include an access code, follow the attached instructions to purchase a code and register for the system.

A new homework assignment will be made available each week (no later than 5:00PM each Monday). Each assignment must be completed by 8:00PM the following Monday in order to obtain full credit. Partial credit may be obtained up to 5 days after the due time (available points decrease by 20% each day). The due date/time for each assignment will be listed with the assignment on the homework site. Each homework set will be pro-rated to have a value of 10 course points. Thus, there will be 150 homework points available this semester. A maximum of 100 points from homework will count toward the final grade. A portion of any homework points obtained in excess of 100 points might be counted as extra credit at the end of the semester.

FULMER 318/319: All chemistry TA's hold their office hours in Fulmer 318 or 319 (Monday through Thursday from 10 am to 4 pm and 6 pm to 9 pm, and Friday from 10 am to 1 pm). You may ask any Chem TA for help in this course.

EXAMS: There will be three midterm exams and a comprehensive final. All exams will be multiple-choice. You will be responsible for bringing a calculator and a pencil to all exams. A bubble-in answer sheet will be provided. No notes or books are allowed. Exams may be given in rooms other than the regular classroom. These rooms will be announced. No make-up exams will be given. If you are unable to take a scheduled midterm exam for academic reasons beyond your control, you will be allowed to schedule the exam at an earlier time. Midterm exams missed due to illness will be excused, with the other exams plus the final pro-rated to count for more. Midterm exams (not the final exam) are scheduled for 6PM on specific Thursday evenings (see the schedule above). There will be a 3PM early exam that day for students with an academic conflict at 6PM.

The final exam for this course will consist of the “First-tem General Chemistry Exam” prepared by the American Chemical Society Division of Chemical Education. This is a nationally available exam that will allow us to compare our results to those at other universities.

ACADEMIC INTEGRITY: Cheating or plagiarism in any form will not be tolerated. Cheating includes, but is not limited to: copying work or allowing your work to be copied; use of unauthorized material during exams, any communication between students during an exam, and actively looking at another student's paper during an exam. Students repeating the course must rework and rewrite all assignments. Plagiarism includes resubmitting previously graded homework or lab reports from a previous semester, even if they were your own work. Plagiarism also includes using laboratory data from another person or a previous semester. Use of any electronic device other than an approved calculator during an examination is cheating. All incidences of cheating will be reported to the Office of Student Conduct. The first incidence of cheating will result in a score of zero for that assignment or exam. A second incident of cheating will result in an F for the course and possible dismissal from the University.

TUTORIALS: These are small classroom meetings associated with your laboratory section and led by your TA. Students who miss tutorial will **not** be allowed into the lab. Tutorials are interactive problem solving sessions driven by your questions. Bring your text, lab manual and calculator to tutorial. Pre-lab assignments must be completed (online) prior to the start of tutorial. Lab reports (post-labs) are due at the start of tutorial. Help with pre-labs and post-labs will not be available in tutorial as they must be completed before attending tutorial. **Tutorial sessions are never canceled!** If your TA fails to arrive for a tutorial section, send one person to contact Dr. Finnegan or Ryan Rice immediately. All others must remain in the tutorial room until the TA or a substitute arrives. Students who leave tutorial under these circumstances will forfeit all points associated with that tutorial/laboratory session.

LABORATORIES: Your course section includes a lecture time and a laboratory time. This is a laboratory UCORE course, so the laboratory must be completed by submission of at least 8 complete laboratory reports based on your own work or approved make-up data in order to pass the course. Thus, obtaining a score of zero for 3 or more experiments will result in an F for the course.

Make-up labs: Labs missed for reasons beyond your control, may be made up, on a space available basis, in the same week that the lab is missed. You will be allowed to make up a maximum of two labs per semester in this manner. Permission for a make-up lab must be obtained, in writing, from the Chemistry Office, Fulmer 319A. The permission slip will be collected and signed by the make-up TA. **We cannot guarantee that make-up space will be available.** If you know in advance that you will miss a lab, visit Fulmer 319A as soon as possible in order to maximize the chance that make-up space will be available.

If make-up space is not available: Complete the pre-laboratory assignment on-line. Go to Dr. Finnegan's office (Fulmer 30A) to be supplied with make-up data for the experiment. Do this as soon as you can! Reports based on make-up data are due at the normal time (in tutorial one week after you should have attended lab) and will be worth no more than ½ credit. You must come to Dr. Finnegan's office in person. Make-up data is not available in electronic form and cannot be emailed.

Pre-laboratory assignments: Pre-laboratory assignments are to be completed online through Mastering Chemistry and are due by 7:00AM Tuesday morning of the week in which the experiment is to be performed. Students who fail to submit a complete pre-lab assignment at this time will be assessed a late penalty on the full report and be required to complete the pre-lab assignment before they are admitted to lab. The student will not be given extra time in the laboratory to make up for laboratory time spent completing the pre-lab. If you complete the pre-lab late (during lab time), you must see Nikki Clark (Fulmer 319A) to obtain a "certificate of completion" that is to be presented to your TA in order to be allowed in lab.

Laboratory procedure: Students are to perform the experiments individually unless the laboratory manual specifically requires partners for the experiment being performed. Each student is expected to record all data and observations for each experiment directly into their own laboratory notebook. Data may not be recorded on loose, 'scratch' paper then transferred to the notebook. Submission of identical data by two or more students who are not assigned to be laboratory partners will be considered cheating. Appropriate penalties will be applied to all parties. You are required to get your TA's signature on your data/observations at the end of the experiment. You will then submit the original copy of the data to your TA before you leave lab.

Laboratory dress code: For your safety, a strict dress code will be enforced in the laboratory. Failure to comply with the dress code will result in expulsion from the laboratory and a consequent score of zero for that experiment. The dress code requires that you be fully clothed from shoulder to toe. No shorts, short skirts, or shoes that do not cover the entire foot are permitted. It is recommended that you purchase and use a full-length lab coat. This will adequately cover the upper body, but your legs, ankles and feet must be covered by your 'street clothing'.

Post-laboratory reports: All laboratory reports (post-labs) will be submitted as electronic copies via a SafeAssign link on the Blackboard site. The post-lab must be submitted by noon (12:00PM) on the Wednesday of the week following the week in which the experiment was performed. The documents may be formatted as a Microsoft Word document (*.docx) or as an Adobe pdf document. Failure to submit a laboratory report for an experiment will result in zero credit for that experiment (no credit will be given for the pre-lab or data & observations sections in the absence of a full report.) All post-labs are to be submitted online. Physical copies of the post-labs may not be submitted and will not be accepted.

The post-lab for a quantitative experiment will consist of two parts: A calculation section and a results and discussion section. The instructions for the calculations section appear in the laboratory manual. The requirements/instructions for the results and discussion section will be posted to the blackboard site. Both sections are to be submitted as a single word-processed document. All word-processing applications have tools to enable you to write mathematical and chemical equations. You are required to learn how to do this. Post-labs for qualitative experiments will consist only of the results and discussion section. Instructions for these will be posted to the blackboard site. The nomenclature worksheet does not have a post-lab.

Late submission penalties: Late laboratory reports will be penalized by the loss of 20% of the total points per day (or portion thereof) that they are late. This penalty is applied after the normal grading of the report. Late penalties are applied to the entire experiment, not just the portion of the report that is late. Late penalties assessed for different parts of the report are cumulative. Reports submitted more than one week late will receive zero points. No reports will be accepted after 5:00 pm on the last day of classes (Friday, April 28th, 2017) even if they are not yet one week late.

Early submission: There is no penalty for early submission of either pre-labs or post-labs. You are encouraged to submit them as soon as possible.

Method of submission: Pre-lab and post-lab assignments are to be submitted electronically. Late submissions are also to be submitted electronically. Lab data is to be submitted at the end of the laboratory period. If you fail to submit data before you leave lab, please bring it to us as soon as possible. Late penalties apply to lab data and, if you left lab without submitting it, it is at least one day late. Remember that, if you wait until your next tutorial, you will get a zero on that experiment. Make certain that your TA's name is on the data pages and bring them to Fulmer 319A during normal business hours (8:00AM-5:00PM M-F). Assignments delivered in any other way (slid under the instructor's office door, for example) will be considered to have been submitted at the time they are found, if they are found.

Adjustments to laboratory scores: The instructor will make every effort ensure that the grading of laboratory reports is consistent and fair. To this end, the instructor reserves the right to normalize the laboratory scores from the different laboratory instructors to the same average. Any such adjustment will be made at the end of the semester after all scores have been submitted. Students are encouraged to bring any concerns about the equity of the grading process to the attention of the course instructor DURING THE SEMESTER. (After grades have been submitted, it is too late.)

KNEWTON ADAPTIVE LEARNING EXERCISES: This semester, we will be evaluating an adaptive learning program administered by Knewton, Inc. There will be eight study modules assigned in this course. Links to these modules will be posted to the blackboard site as the modules become active. You will receive 5 course points for each module that you complete (answer all questions and get to the end screen) and 10 course points for completing an evaluation of the system at the end of the semester. Knewton is providing these modules at no charge to the student. You do not need to purchase anything to complete the Knewton modules and evaluation.

ACCOMODATIONS: Reasonable accommodations are available for students who have a documented disability. If you need accommodations to fully participate in this class, please visit the Access Center. All accommodations **MUST** be approved through the Access Center (Washington Bldg, Room 217). Please stop by or call 509-335-3417 to make an appointment with an Access Advisor. Further information is available at <http://accesscenter.wsu.edu>

Accommodations are available for students for whom examinations fall on days objectionable due to religious beliefs. Requests for such accommodation must be presented, in writing, to the course instructor at least one week prior to the examination.

EMERGENCY NOTIFICATION SYSTEM: Washington State University is committed to enhancing the safety of the students, faculty, staff, and visitors. It is highly recommended that you review the Campus Safety Plan (<http://safetyplan.wsu.edu/>) and visit the Office of Emergency Management web site (<http://oem.wsu.edu/>) for a comprehensive listing of university policies, procedures, statistics, and information related to campus safety, emergency management, and the health and welfare of the campus community.

STUDENT LEARNING OUTCOMES: Chemistry 105 fulfills three credits of Inquiry in the Physical Sciences [PSCI] and one credit of laboratory as part of the WSU Common Course Requirements (UCORE). As with all UCORE courses, Chemistry 105 is designed to advance students toward the WSU Learning Goals, especially Scientific Literacy, Critical and Creative Thinking, Quantitative Reasoning, and Information Literacy. In particular, students who successfully complete Chemistry 105 will be able to:

1. Develop an understanding of the concepts, models, and theories that form a foundation for the field of chemistry (the understanding of how the behavior of matter is determined by the properties of atoms and molecules).
2. Remember the basic vocabulary of chemistry, the metric prefixes and the names of the most common elements.
3. Apply standard algorithmic calculation procedures, individually and in combination, that relate macroscopic properties, including mass, volume, pressure, and temperature of substances. Be able to balance chemical reactions and relate amounts of reactants and products as well as associated energy changes. In addition, be able to relate macroscopic and atomic level properties of numbers of atoms and molecules, chemical formulas, and molecular structures and properties.
4. Apply models of bonding to predict and describe the structure of molecules including their physical properties.
5. Create procedures to solve problems by applying single and multiple concepts to new situations.
6. Apply chemical procedures and evaluate experimental results to develop an appreciation for the experimental basis of chemical knowledge and experimental methods through laboratory work. (Lab reports)
7. Write effectively about scientific experiments by describing laboratory procedures and results, and then evaluating and presenting a discussion of these results in the manner of a scientific report.

ASSESSMENT: The SLOs 1 through 5 will be assessed with reading, in-class, and homework assignments done through an online system. In addition they will be assessed with the evening exams. SLOs 6 and 7 will be assessed through the written lab reports.

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SCHEDULE**CHEMISTRY 105****SPRING 2017**

	Date	Chapter	Topic	Lab Experiment
1	Jan 9–13	1, 2, 3.1-3.7	Atoms, ions, atomic mass, the mole, bonds, chemical formulae & nomenclature, acids.	Tutorial only.
2*	Jan 17 – 20	3.7-3.12	Molar mass, empirical formula, chemical equations.	Worksheet on page 13: <i>Inorganic Nomenclature</i> .
3	Jan 23–27	4.1-4.4	Stoichiometry, limiting reactants, percent yield, solution stoichiometry	Experiment on page 23: <i>Laboratory Techniques and Measurement</i>
4	Jan 30–Feb 3	4.5-4.9	Aqueous reactions, net ionic equations, redox reactions, oxidation numbers.	Experiment on page 35: <i>Properties and reaction of Acids and Bases</i>
5	Feb 6–10	5.1-5.6	Gasses: properties, stoichiometry, partial pressure.	Tutorial plus Exam 1 practice
6	Feb 13–17	5.7-5.9 6.1-6.4	Kinetic molecular theory, effusion and diffusion. Thermodynamics: heat and work.	Experiment on page 75: <i>The Density of Air</i>
7*	Feb 21–24	6.5-6.7	Enthalpy (ΔH), thermochemistry, calorimetry.	Experiment on page 43: <i>Molar mass of a known acid</i>
8	Feb 27–Mar 3	6.8-6.9 7.1-7.3	Hess's Law. Electromagnetic radiation, atomic spectra.	Experiment on page 65: <i>Enthalpy of formation of ammonium chloride</i>
9	Mar 6–10	7.4-7.6	wave-particle duality, The quantum mechanical atom, orbitals	Tutorial plus Exam 2 practice
	Mar 13– 17	SPRING BREAK		
10	Mar 20–24	8.1-8.5	Multi-electron atoms, electron configurations, valence electrons.	Experiment on page 53: <i>Molar mass of an unknown acid</i>
11	Mar 27–31	8.6-8.9 9.3-9.4	Periodic trends, magnetic properties. Ionic bonds, lattice energies.	Experiment on page 93: <i>Analysis of bleach by Iodometry</i>
12	Apr 3–7	9.1-9.2, 9.4- 9.7, 9.10- 9.11	Covalent bonds, bond energy, bond length, bond polarity, metallic bonds. Lewis structures,	Experiment on page 89: <i>Preparation of an Iron Oxalate Complex</i>
13	Apr 10–14	9.7-9.9 10.1-10.4	Lewis structures, resonance, formal charge. VSEPR theory: geometry and shape,	Tutorial plus Exam 3 practice
14	Apr 17–21	10.5-10.7	VSEPR theory: molecular shape and polarity Valence bond theory.	Experiment on page 81: <i>The Shapes of Molecules and Ions</i>
15	Apr 24–28	10.8	Molecular orbital theory.	Tutorial only
	May 1 (Monday)	FINAL EXAM 7 : 0 0 P M - 8 : 5 0 P M		

*Monday Holiday: No lecture on January 16th or February 20th

Get started with Modified MasteringChemistry and Blackboard Learn

First, make certain that you have these 2 things...

Email address: You'll get important emails from your instructor at this address.

Access code or credit card: The required access code is part of the textbook bundle purchased at the bookstores. If you did not purchase the bundle, you can buy instant access with a credit card or a PayPal account during registration.

Next, register!

1. Log in to Blackboard Learn, <https://learn.wsu.edu>, using your WSU network ID and password. Click on the link to our course: "Chemistry 105: Principles of Chemistry I (2017-SPRI-PULLM-CHEM-105-1243-LAB)". Click on the link to **Mastering Chemistry Course Home** to begin the registration process.
2. The registration page will appear in a new window or tab. It will start with the Mastering user agreement. Click the "I accept" button.
3. Sign into or create your Pearson account:
You will be prompted to login with your Pearson account. If you have a Pearson account, enter the username and password. If you don't have a Pearson account, select the option to Create a new Pearson account. If you have ever used a Pearson Publishing on-line product before, you have a Pearson account. If you are not certain, select "Create" and enter the email address and username you want to use. The system will tell you if there is already an account associated with that email/user name.
4. The next page will offer you four options:
 - If you purchased the text bundle from the bookstore, click the button labeled "Access Code". Your access code is in a cardboard insert wrapped with the text book. Enter your **Access Code** in the spaces provided on the page that appears.
-OR-
 - Purchase Mastering Chemistry access with the e-book text by clicking on the upper button in the **Use a Credit Card or PayPal** section (the right column). The cost is listed on the button. Follow the instructions to complete your purchase.
-OR-
 - Purchase Mastering Chemistry access without the e-book by clicking on the lower button in the **Use a Credit Card or PayPal** section (the right column). The cost is less than for the homework/e-book combination. But, if you choose this option, you will be required to pay separately for access to LearningCatalytics (\$12 at the LearningCatalytics site). Follow the instructions to complete your purchase.
-OR-
 - If you are not yet ready to purchase homework access, you may select the "Get temporary access without payment for 14 days". If you choose to do this, keep in mind that you will lose access to and credit for the homework if you do not actually purchase a code before the fourteen days are up.
5. You are now registered! Click on the "Go to your course" button to access your Modified Mastering product.