SYLLABUS *CHEMISTRY 116* *SPRING 2017*

LECTURES: MWF 12:10PM Fulmer 201

INSTRUCTORS: Professor Alex Li Fulmer 171 335-7196 dequan@wsu.edu
Office Hours: M and W, 1-2 PM, or by appointment

GENERAL CHEMISTRY OFFICE: Nikki Clark Fulmer 319A 335-1516 nikki_clark@wsu.edu
LABORATORY SUPERVISOR: Ryan Rice Fulmer 309 335-6358 rwrice@wsu.edu
BLACKBOARD/MASTERING/LEARNING CATALYTICS:
Dr. Krista Nishida Fulmer 317A 335-9435 krista_nishida@wsu.edu

COURSE WEBSITE: Blackboard Learn (Bb) https://learn.wsu.edu

GRADING:		
	3 "Midterm" Exams	300
	≤12 In-Class Quizzes	130
	15 Homework Sets	150
	11 Laboratory Experiments/Worksheets	220
	Final Exam	200
	TOTAL	**1000**

GRADE RANGES: (minimum points to achieve)

900 points	A	740 points	C+
870 points	A-	700 points	C
840 points	B+	670 points	C-
800 points	B	640 points	D+
770 points	B-	600 points	D

Less than 600 points: F

MIDTERM EXAMS:	Thursday	Feb 9	6:00– 7:30 pm	(Chapters 11-14)
	Thursday	Mar 9	6:00– 7:30 pm	(Chapters 14-17)
	Thursday	Apr 13	6:00– 7:30 pm	(Chapters 17-19)
FINAL EXAM	Monday	May 1	7:00-8:50 pm	(Chapters 11-21)

PREREQUISITES for this class are: (You will be dropped if you do not meet these pre-requisites.)
You must have passed Chemistry 105 or its equivalent with a grade of B or better.
You must have passed or been placed beyond Math 106 or Math 107 or the equivalent. Courses that are considered beyond Math 107 are Math 140, 171, 172, 182, or 202.

COURSE OBJECTIVES, LEARNING GOALS AND EXPECTED OUTCOMES: Chemistry 116 is designed for advance students to excel in Learning, especially Scientific and Information Literacy, Critical and Creative Thinking, Quantitative Reasoning, and Problem Solving. Specifically, students who successfully complete Chemistry 116 will be able to:

1. Master the fundamental concepts, models, and theories that form a foundation for the field of chemistry and understand the behavior of matter is determined by the properties of atoms and molecules.
2. Learn ordered and non-ordered condense phase structures and corresponding properties generated by their corresponding structures.
3. Learn and apply solution properties and how their affect physical parameters of solutions.
4. Learn and apply the principles of thermodynamics as they apply to chemical equilibrium, including the relationships between equilibrium constants, free energy, enthalpy and entropy.
5. Apply the principles of equilibrium to solubility, pH, and electrochemical equilibrium in aqueous solution.
6. Learn and apply the principles of chemical kinetics as they apply to chemical reactions in general and how they are linked to and contrasted with equilibrium principles.
7. Learn and apply the principles of nuclear reactions, half-life, and mass-energy conservation.
8. Learn the basic relationships between batteries and redox chemical reactions and use standard reduction potentials to construct spontaneous reactions that power the batteries.
9. Learn the basic concepts of organic chemical nomenclature and some principle reactions as a preparation for more advanced study in later courses.

TEXT: *Chemistry: A Molecular Approach* by Tro, 4th edition, Pearson (2016). ISBN: 978-1-323-45432-9 (hardcover) or 978- 1-323-43344-9 (eText) (Required). The text and access to the Modified 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 at the bookstores or on the publisher's website accessed through Bb.

ONLINE COMPONENTS: There are several aspects of the course, described below, that are accessed through the Blackboard Learn online course management system (https://learn.wsu.edu). Mastering Chemistry and Learning Catalytics are accessed through the Mastering Chemistry link on Blackboard. You will need an access code to establish your account. Mastering Chemistry access codes are bundled with new copies of the textbook and sold separately in the bookstores. You may also purchase a Mastering Chemistry registration code or a 14-day free trial, through the Pearson website when you initially register. This initial registration is only through the Bb course website. Detailed instructions for accessing the Mastering system and Learning Catalytics the first time are given at the end of the syllabus. (Required)

LAB TEXT: *Chemistry 105-106 General Chemistry Laboratory Manual* by WSU Chemistry Department, Star Publishing (2015) is required to complete the laboratory portion of this course. (Required)

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

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

LABORATORY COAT: Required for Chem 106/116. (sold in Fulmer 318 the 1st and 2nd week of class and at the bookstores.)

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 or Voyage 200); PDAs; palmtop, laptop and handheld computers; and cell phone/calculator combinations may not be used during quizzes and examinations. You are responsible for bringing your calculator to all tutorials, lectures, labs and exams.

COURSE WEBSITE: We will be using the Bb course management system for the course website. This can be accessed via https://learn.wsu.edu. You are responsible for checking this site regularly. Use your WSU network ID and password to log in. You can also send email to the course instructor, TAs, or other students via the Bb Course Email tool.

This syllabus and all course-related materials, presentations, lectures, *etc.* are our intellectual property and may be protected by copyright. Selling class notes and photos through commercial note taking services, without our written advance permission, could be viewed as copyright infringement and/or an academic integrity violation, WAC 504-26-010 (3)(a,b,c,i). Further, the use of University electronic resources (*e.g.*, Blackboard) for commercial purposes, including advertising to other students to buy notes, is a violation of WSU's computer abuses and theft policy (WAC 504-26-218), a violation of WSU's Electronic Communication policy (EP 4), and also violates the term of use for the Blackboard software program.

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.

STEPHENSON TUTORS: The Chemistry Department provides tutors for Chem 116 in the Stephenson tutoring center Sunday through Wednesday evening from 6 to 10 pm. These tutors are available to all students in Chem 116.

DISCUSSION FORUMS ON BLACKBOARD LEARN AND FACEBOOK: The Discussion section of Bb is open to everyone involved in the course. Through it you can post questions and get answers from other students as well as the TA of Chem 116, and you can see the questions and answers posed by others.

QUESTIONS ABOUT ELECTRONIC RESOURCES: When encountering difficulties with either Mastering Chemistry or Learning Catalytics, you are encouraged to use the built-in Help & Support system. If you would rather not communicate electronically, you can call Pearson's WSU Priority phone number at (855) 875-1797 or the General Student Help phone number at (800) 677-6337 24-hours a day. The Discussion Forums and Facebook Community are also resources.

LECTURES: Lectures must be attended on a regular basis. You will be expected to review and read the textbook and notes covered so far in the course before coming to class. Lectures will concentrate on clarifying concepts and illustrating chemical principles and developing skills for problem solving. You are encouraged to form collaborative study groups outside of class and meet regularly to brainstorm about the concepts and principles discussed in lectures.

HOW TO STUDY: Each one-hour lecture will probably require more than three hours of studies to adequately digest. After each lecture and before the next lecture, study the notes, textbook, and practice all the in-chapter problems in order to transfer what you learned from short-term memory to long-term memory. This is the essential PROCESS in acquiring knowledge, which requires one to practice again and again in different facets.

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. A single midterm exam missed due to illness can be excused with instructor approval, with the other exams plus the final pro-rated to count for more**. By University rule, evening exams take precedence over all other university activities.**

QUIZZES: There will be maximum 12 quizzes planned for the weeks without midterm exams. The quizzes graded plus in-class interactions equivalent to quizzes will be counted toward the total points of 130. Quizzes are given in lecture randomly covering the recent lecture, homework and laboratory materials. Therefore attendance of lecture is important; missed quizzes cannot be rescheduled. You will be allowed to prepare a single 3" × 5" card containing your HAND-WRITTEN notes for use during each of the quizzes. No other handwritten material and no printed or photocopied material may be used during the quiz, except for an approved periodic table (the table that appears on the back of your laboratory manual).

HOMEWORK: There will be weekly homework assignments administered through the Mastering Chemistry website accessed through Bb.

A new homework assignment will be made available each week (no later than 7:00AM each Tuesday). Each assignment must be completed by 7:00AM the following Tuesday. 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, by taking the fraction correct and multiplying it by the 10 points possible.

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. Lab reports are due at the start of tutorial. Help with pre-labs and lab reports 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 the General Chemistry office (335-1516, Fulmer 319A) 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 (lab report, lab, and quiz).

LABORATORIES: Your course section includes a lecture time and a laboratory time. This is a laboratory UCORE course, and the laboratory must be completed 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**: Bring your completed pre-laboratory assignment to Ryan Rice's office (Fulmer 309) to be supplied with make-up data for the scheduled 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.

Pre-laboratory assignments: Pre-laboratory assignments are found online through Mastering Chemistry and are due Tuesdays at 7:00 am the week you are performing that experiment. Students who fail to submit a complete pre-lab assignment at this time will receive a zero on the pre-lab **AND** be assessed a late penalty on the full report, as well as be required to complete the pre-lab assignment before they are admitted to lab. A pre-lab verification slip must be obtained from the general chemistry office prior to being 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.

Laboratory procedure: Students will 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. Some experiments will require you to transfer data from your notebook into a laboratory computer before you leave lab. The data and any computer-generated data must be written in the notebook! 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 required that you wear 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'.

Laboratory reports: Each experiment will have **either** a short post-lab report or a long post-lab report, due at the start of your tutorial, one week following the completion of that experiment. These will be assigned through **Blackboard** and include the specific instructions within the Blackboard assignment. Each short report will be worth 15 points and each of the three long reports will be worth 35 points. Post-laboratory reports must be submitted both electronically through Blackboard and manually (hard-copy) in tutorial. Failure to submit a post-lab for an experiment will result in zero credit for that experiment (no credit will be given for the pre-lab or data and observations sections in the absence of a submitted post-lab). Failure to submit **both** formats on time will result in late penalties. If only one format is submitted, a score of zero will be given for the experiment.

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 instructors reserve 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. TA performance will be assessed throughout the semester with the goal of eliminating any necessity for these adjustments. Students are encouraged to bring any concerns about the equity of the grading process to the attention of the course instructor.

CLASS POLICY ON LATE (OR EARLY) ASSIGNMENTS:

Laboratory reports: Late laboratory reports will be penalized by the loss of 20% of the total points per day (or portion thereof) that they are late. *Reports submitted after the start of tutorial are a day 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 28, 2017) even if they are not yet one week late.

Early submission: If you know that you will not be present at the time a laboratory report is due, they may be submitted early without penalty. Homework assignments may be completed on the Mastering Chemistry system as soon as the assignment is posted.

Method of submission: It is best to personally deliver late or early submissions to the instructor or TA. Note that, outside of class/laboratory times and posted office hours, we make no pledge to be present or available for this purpose. If you are submitting work at other than the specified time, it is your responsibility to find us. Material may be submitted to Fulmer 319A during normal business hours (8:00AM-5:00 PM M-F). Assignments delivered in any other way (slid under the instructor's or 319's office door, for example) will be considered to have been submitted at the time they are found, if they are found.

Procedure for submission

- Write your TA's name at the top of the assignment.
- Time-stamp your assignment using the time-stamping machine in Fulmer 319A.
- Place your assignment on the 106 shelf in Fulmer 319A (next to the time-stamp machine).

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 at quizzes and exams, any communication between students during a quiz or exam, and actively looking at another student's paper during a quiz or 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. Obtaining information about quizzes taken in other sections is considered cheating. Use of any electronic device other than an approved calculator during a quiz or examination is cheating. All incidences of cheating will be reported to the Office of Student Affairs. The first incidence of cheating will result in a score of zero for that assignment, quiz or exam. A second incident of cheating will result in an F (without the option to withdraw) for the course and possible dismissal from the University.

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.

Getting started with Modified Mastering and Blackboard

1. Log in to Blackboard Learn Learning Management System (https://learn.wsu.edu), using your network ID and password. Select the course "Principles of Chemistry II". From there, look for the link to **"Mastering Chemistry"** on the left and click it to begin the registration process.
2. Click the button "**Mylab and Mastering Course Home**"
3. Accept the user agreement.
4. You will be prompted to log in with your Pearson account. If you have a Pearson account, enter the username and password. If you do not remember your username and/or password, then use the help provided through Pearson to get this information. If you establish a new account, then you will have to pay again. If you have **never** had a Pearson account select the option to "**Create a New Pearson Account**" and do so. Be sure to record your username and password.
5. If you purchased the textbook bundle from the bookstore, or otherwise purchase the Modified Mastering Chemistry access code, click the button labelled "**Access Code**" and enter your access code on the next screen (replacing the sample code). Keep a record of this code also. Otherwise purchase instant access now by clicking on the purchase options under the "**Use a Credit Card or PayPal**" section. You may also select Temporary Access without payment for 14 days.
6. You are now registered! Click on the "**Go to your course**" button to access Mastering Chemistry.

SCHEDULE *CHEMISTRY 116* *SPRING 2017*

Wk	Date	Chapter	Topic	Laboratory Experiment	Lab report due	Quiz/ Exam	Homework Due
1	Jan 9-13	11.1-11.4	Liquid, Gases, Intermolecular forces	Introduction to Cation Analysis	Intro to Cations	Quiz 1	None
2*	Jan 16-20 MLK Jr Day	11.5-11.9	Vapor Pressure, Phase Diagram	Analysis of Cations, **Pre-lab**	None	Quiz 2	Hw #1 Tu, 1/17
3	Jan 23-27	12.2-12.9	X-ray and Crystal Structures	Analysis of Cations (continued)	None	Quiz 3	Hw #2 Tu, 1/24
4	Jan 30-Feb 3	13.3-13.7	Solutions and Colligative Properties	Analysis of Unknown Cations, **Pre-lab**	Cations	Quiz 4	Hw #3 Tu, 1/31
5	Feb 6-10	14.2-14.7	Chemical Kinetics	Colorimetric Determination of Concentration, **Pre-lab**	Unknown Cations	**Exam 1** Thu 2/9	Hw #4 Tu, 2/7
6	Feb 13-17	15.3-15.9	Chemical Equilibrium	Kinetics I, **Pre-lab**	Colorimetric	Quiz 5	Hw #5 Tu, 2/14
7*	Feb 20-24 Presidents' Day	16.2-16.6	Acids and Bases	Kinetics II, **Pre-lab**	Kinetics I	Quiz 6	Hw #6 Tu, 2/21
8	Feb 27-Mar 3	16.7-16.11	Acids and Bases	Determination of an Equilibrium Constant, **Pre-lab**	Kinetics II	Quiz 7	Hw #7 Tu, 2/28
9#	Mar 6-10	17.2-17.3	Aqueous Ionic Equilibrium: Titrations,	Titration of a Polyprotic Acid, **Pre-lab**	Equilibrium	**Exam 2** Thu 3/9	Hw #8 Tu, 3/7
	Mar 13-17	**SPRING BREAK**					
10	Mar 20-24	17.4-17.8	Aqueous Ionic Equilibrium: Solubility	pH Buffers, **Pre-lab**	Titration	Quiz 8	Hw #9 Tu, 3/21
11	Mar 27-31	18.1-17.5	Free Energy and Thermodynamics	Analysis of Anions, **Pre-lab**	pH Buffers	Quiz 9	Hw #10 Tu, 3/28
12	Apr 3-7	18.6-18.10	Thermodynamics, and Chemical Reactions	Analysis of Anions (continued)	None	Quiz 10	Hw #11 Tu 4/4
13	Apr 10-14	19.2-19.9	Electrochemistry	Analysis of Unknown Anions, **Pre-lab**	Anions	**Exam 3** Thu 4/13	Hw #12 Tu 4/11
14	Apr 17-21	20.1-20.12	Nuclear Chemistry	Voltaic Cells, **Pre-lab**	Unknown Anions	Quiz 11	Hw#13 Tu 4/18
15	Apr 24-28	21.1-21.8	Organic Chemistry	**Course Evaluations Online**	Voltaic Cells	Quiz 12	Hw #14 Tu 4/25; Hw # 15 Sa, 4/30
16	May 1	*FINAL EXAM: Monday, May 1, 2017, 7:00-8:50 PM*					

* No Monday lecture due to holiday, homework is still due on Tuesday 7:00AM.

No Friday lecture.