CHMY 121N Introduction of General Chemistry
Autumn 2017
SYLLABUS

Course web site: University of Montana Moodle Site (http://umonline.umt.edu/)
All lectures, workshop keys and midterm keys will be posted on Moodle.

Instructor
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Office: Chemistry 206

Office Hours
Tuesday, Thursday: 10:00 am to 3:00 pm
Or by appointment

Prerequisite
   The ability to use algebra: rearrange equations, work with fractions, and be able to calculate logs and exponents. If your algebra skills are weak, please master them prior to attempting CHMY 121N. You should be *eligible to enroll* in MATH 117 or higher to satisfy the math prerequisites for this course.

Course Description
      CHMY 121N is aimed at students who require a working knowledge of chemistry for careers in fields such as forestry, resource management, wildlife biology, botany, zoology, nursing, medical technology, physical therapy, athletic training, exercise science, forensic anthropology and environmental studies. It provides a foundation of chemical principles illustrated through their application to "real world" examples, especially those with environmental, physiological or medical implications. The course systematically develops skills in fundamental chemistry: atomic and molecular theory, nuclear chemistry, chemical bonding, chemical reactions (precipitation, acid/base and redox), states of matter, and aqueous solution chemistry. In addition, you will gain experience with analytical thinking and quantitative problem solving. Organic chemistry - the study of carbon-containing compounds - is integrated into lecture throughout the semester.

Required Materials

- **Text Book:** *Introduction to General, Organic, and Biochemistry. 11th Edition* by Morris Hein, Scott Pattison and Susan Arena, John Wiley & Sons, 2015. We are using a

custom version of this text which consists of the first 18 chapters of the full textbook. A hard copy of the custom textbook is available in the University of Montana Bookstore and it is bundled with an access code to the **WileyPlus online homework-learning system.** The Bookstore Price for the hard copy and WileyPlus is $147.50. You can find less expensive used-copies of the full textbook online but you will have to purchase access to WileyPLUS which costs $120. WileyPlus includes an e-copy of the text. If you want a hard copy of the text the Bookstore is probably the best way to go.

- **WileyPLUS** online homework. The web address is www.wileyplus.com. The six digit course ID is **589569**. The course name is **INTRO CHEM 121 Spring 17 DAN DWYER**

- **A scientific calculator**. Your calculator needs to be able to handle logs and exponents.

Lecture
MWF 12:00 noon– 12:50 PM, Urey Lecture Hall.
MWF 2:00 PM -2:50 PM
Each regular lecture will be used to introduce new material and to work on problems in groups. This last part is based on the idea that active students learn more efficiently than passive students. A traditional lecture is a passive way of learning.

Recitations
Recitations are held on Tuesdays. Students will complete a recitation exercise during recitation period. The recitation exercises are open-book graded worksheets. (Please bring you textbook, class notes and calculator). You are encouraged to work on the exercises in groups of 2-3. Please go to the section in which you are officially registered. You must turn in your exercise to your TA before leaving recitation. There will be 12 recitation worksheets each worth 10 points. 100 points on the recitation exercises will be considered a perfect score. **Any points above 100 will be considered bonus points toward your total points**.

Online Homework (WileyPLUS)
The online homework is required and will be graded. There are 12 online homework assignments. The homework assignments are generally due on Sunday evenings at 11:45 PM. However, it is good practice to work on the homework assignment that covers the material to date as soon as possible after each lecture. The homework must be submitted on time in order to receive full credit for the assignment. Each of the 12 homework assignments is worth 10 points. If the homework is not completed by the due date a penalty of 5% will apply to that assignment.

Midterm Exams

Four midterm exams will be given during this course on dates specified on the calendar (see below). Each midterm will cover the material discussed during the prior 8-9 lectures. Exams will be administered during the lecture times. Due to the large size of this course all exams will be multiple choice graded by the University's *Scantron* System. You will need to bring a small scantron form and two number two pencils to all exams. The "small red scantron" forms can be purchased at the bookstore and other locations around campus.

Makeup Exams

If you miss an exam due to legitimate excuses (illness, military duty, death in the family, field trip, etc.) you must contact me **before the exam** to schedule a make-up. No more than one make-up per semester will be allowed.

Final Exam

The final exam is given on the date and time specified by the Registrar.

The final exam i*s a comprehensive exam that will cover all of the material addressed in class*.

The final is mandatory; you will be assigned a grade of **F** for the course if you do not take the final exam, regardless of your point total prior to the final exam.

Assessment and Grades

10 Recitations	@ 10 points each =	100 points
10 WileyPlus Homework	@ 10 points each =	100 points
4 Midterm Exams	@ 100 points each =	400 points
1 Final Exam	@ 200 points =	200 points
Total		**800 points**

The actual number of recitations is 12 and the actual number of WileyPlus assignments is 12. Therefore, it is possible to achieve a total of 40 additional bonus points for correctly completing all recitation and homework assignments.

Points to Letter Grade Conversion Table

A	740 – 800 points		A–	720 – 739 points
B+	696 – 719 points		B	664 – 695 points
B–	640 – 663 points		C+	616 – 639 points
C	584 – 615 points		C–	560 – 583 points
D+	536 – 559 points		D	504 – 535 points
D–	480 – 534 points		F	0 – 479 points

A grade of CR for those using CR/NCR option will require a total of 450 points.

Study Time

A standard formula used in colleges and universities is to allow for two hours study time for each hour of lecture. Given that this is a three-credit course, there are three scheduled lecture hours per week and thus six hours per week outside of class, for a total of nine hours per week devoted to the course. (A standard load of 15 credits therefore results in a 45-hour school week.) This means that an "average" student should spend nine hours per week working on this course. Students who expect higher than average grades should expect to spend a higher than average amount of time studying for the course.

Drops

September 21st by 5:00 PM is the last day to drop the class without W on your transcript. Also, this is the last day to switch to Audit.

November 2nd is the last day to drop with the signatures of your advisor and the instructor with W appearing on your transcript.

November 2nd, drops with the signatures of your advisor, the instructor and the Dean of the College and WP or a WF will appear on your transcript.

Disabilities

Any student in this course with disability, which may prevent the student from fully demonstrating his or her abilities, should contact the instructor personally as soon as possible so necessary accommodations can be discussed to ensure full participation. Students with disabilities are strongly encouraged to contact Disability Services for Students (DSS) in the Lommasson Center room 154, phone (406) 243-4216

Academic Honesty

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the university. All students need to be familiar with the Student Conduct Code. The Code is available for review online at http://life.umt.edu/vpsa/student_conduct.php

Grading Philosophy

An "A" student is someone who can solve homework-like problems under exam conditions with near-100% accuracy and can demonstrate the understanding of the major course concepts through the correct solution of application questions on exams, and who can successfully solve novel problems on exams.

A "B" student is someone who can solve homework-like problems under exam conditions with near-100% accuracy and can demonstrate the understanding of the major course concepts through the correct solution of application questions on exams, but struggles with novel problems on exams.

A "C" student is someone who can solve **most** homework-like problems under exam conditions and can demonstrate the understanding of the major course concepts through the correct solution of most application questions on exams, and has a demonstrable understanding of the major concepts of the course.

A "D" student earns a passing grade. Thus a demonstrated understanding of the major concepts of the course is required. This includes the ability to solve most homework-like problems on exams.

A student who cannot demonstrate an understanding of the major concepts of the course through his/her performance on exams will not earn a passing grade.

CHMY 121N Introduction of General Chemistry
Autumn 2017 Calendar

Date	Lecture	Homework
September 1	Lecture 1 Chapter 1 Scientific Method, States of Matter Classification of Matter	Work on Chapter 1 questions in WileyPLUS Assignment 1
September 4	Labor Day No Classes	
September 5	Recitations do not meet	
September 6	Lecture 2 Chapter 2.1-2.4 Scientific Notation, Measurement and Uncertainty, Sig Figs	Work on Chapter 2.1-2.4 questions in WileyPLUS Assignment 1
September 8	Lecture 3 Chapter 2.5-2.8 Metric System, Dimensional Analysis, Density	Work on Chapter 2.5-2.8 questions in WileyPLUS Assignment 1
September 10	Sunday	**WileyPLUS Assignment 1 due at 11:55 PM**
September 11	Lecture 4 Chapter 3 Elements, Periodic Table, Compounds, Chemical Formula	Work on Chapter 3 questions in WileyPLUS Assignment 2
September 12	Recitation 1	
September 13	Lecture 5 Chapter 4 Physical and Chemical Properties, Chemical Change, Chemical Equations, Energy, Changes in Chemical Energy, Specific Heat Calculations	Work on Chapter 4 questions in WileyPLUS Assignment 2

Date	Lecture	Homework
September 15	Lecture 6 Chapter 5.1 - 5.4 Dalton's Atom, Electric Charge, Subatomic Parts of Atom, Nuclear Atom	
September 17	Sunday	
September 18	Lecture 7 Chapter 5.5-5.6 Isotopes, isotopic notation, mass number of isotopes, atomic mass	**WileyPLUS Assignment 2 Due 11:45 PM**
September 19	Recitation 2	
September 20	Lecture 8 Chapter 6.1-6.3 Nomenclature I Common vs Systematic, Elements and Ions, Ionic Compounds, Binary Compounds	Work on Chapter 6.1-6.3 questions in WileyPLUS Assignment 3
September 22	Lecture 9 Chapter 6.4-6.5 Nomenclature II, Compounds with Polyatomic Ions, Acids	Work on Chapter 6.4-6.5 questions in WileyPLUS Assignment 3
September 24	Sunday	**WIleyPlus Assignment 3 Due 11:45 PM**
September 25	Lecture 10 Midterm 1 Review	
September 26	Recitation 3	
September 27	Lecture 11 **Midterm 1**	
September 29	Lecture 12 Chapter 7.1 The Mole and Avogadro's Number	Work on Chapter 7.2-7.3 questions in WileyPLUS Assignment 4
October 1	Sunday	**WIleyPLUS Assignment 4 Due 11:45 PM**
October 2	Lecture 13 Chapter 7.2-7.3 Molar Mass of Compounds, Percent Composition of Compounds	Work on Chapter 7.2-7.3 questions in WileyPLUS Assignment 5
October 3	Recitation 4	
October 4	Lecture 14 Chapter 7.4-7.5 Calculating Empirical Formulas, Calculating Molecular Formulas from Empirical Formulas	Work on Chapter 7.4-7.5 questions in WileyPLUS Assignment 5
October 6	Lecture 15 Chapter 8.1-8.2 Chemical Equations, Balancing Chemical Equations	Work on Chapter 8.1-8.2 questions in WileyPLUS Assignment 5
October 8	Sunday	**WIleyPLUS Assignment 5 Due 11:45 PM**
October 9	Lecture 16 Chapter 8.3-8.5 Types of Chemical Reactions, Heat in Chemical Reactions	Work on Chapter 8.3-8.5 questions in WileyPLUS Assignment 6
October 10	Recitation 5	
October 11	Lecture 17 Chapter 9.1-9.4 Stoichiometry I Mass to Mass Stoichiometry	Work on Chapter 9.1-9.4 questions in WileyPLUS Assignment 6
October 13	Lecture 18 Chapter 9.5- Limiting Reactant, Percent Yield	

Date	Lecture	Homework
October 15	Sunday	**WIleyPLUS Assignment 6 Due 11:45 PM**
October 16	Midterm 2 Review	
October 17	Recitation 6	
October 18	**Midterm 2 Chapter 6-9**	
October 20	Lecture 21 Chapter 10.1-10.3 Atomic Theory I, Electromagnetic Radiation, Bohr Model of Atom, electron energy config	Work on Chapter 10.1-10.3 questions in WileyPLUS Assignment 7
October 22	Sunday	**WIleyPLUS Assignment 7 Due 11:45 PM**
October 23	Lecture 22 Chapter 10.4-10.5 Atomic Theory II, Electron Structure and Periodic Table tions	Work on Chapter 10.4-10.5 questions in WileyPLUS Assignment 8
October 24	Recitation 7	
October 25	Lecture 23 Chapter 11.1-11.4 Periodic Trends, Lewis Diagrams of Atoms, Ionic Bond, Predicting Formulas of Ionic Compounds	Work on Chapter 11.1-11.4 questions in WileyPLUS Assignment 8
October 27	Lecture 24 Chapter 11.5-11.7 Covalent Bonds, Electronegativity, Polar Bonds, Lewis structures of Compounds	Work on Chapter 11.5-11.7 questions in WileyPLUS Assignment 8
October 29	Sunday	**WIleyPLUS Assignment 8 Due 11:45 PM**
March 27,28		
October 30	Lecture 25 Chapter 11.8-11.10 Complex Lewis Structures, Compounds Containing Polyatomic ions, Molecular Shape, VSEPR	Work on Chapter 11.8-11.10 questions in WileyPLUS Assignment 9
October 31	Recitation 8	
November 1	Lecture 26 Chapter 12.1-12.5 Gases, Boyle's Law, Charles' Law, Avogadro's Law, Combined Gas Law	Work on Chapter 12.1-12.5 questions in WileyPLUS Assignment 9
November 3	Lecture 27 Chapter 12.6-12.9 Ideal Gas Law, Dalton's Law of Partial Pressure, Density of Gases, Gas Stoichiometry	Work on Chapter 12.6-12.9 questions in WileyPLUS Assignment 9
November 5	Sunday	**WIleyPLUS Assignment 9 Due 11:45 PM**
November 6	Lecture 28 Chapter 13.1-13.4 Liquids, Surface Tension, Vapor Pressure, Melting Point, Boiling Point, Heating Curves	Work on Chapter 12.6-12.9 questions in WileyPLUS Assignment 10
November 7	Recitation 9	

Date	Lecture	Homework
November 8	Lecture 29 Chapter 13.5-13.7 Intermolecular Forces, Hydrates, Water	Work on Chapter 13.5-13.7 questions in WileyPLUS Assignment 10
November 10	Veteran's Day No Classes	
November 12	Sunday	**WIleyPLUS Assignment 10 Due 11:45 PM**
November 13	Lecture 30 Midterm 3 Review	
November 14	Recitation 9	
November 15	**Midterm 3 Chapters 10-13**	
November 17	Lecture 32 Chapter 14.1-14.3 Solutions, Solubility, Rates of Dissolution	Work on Chapter 14.1-14.3 questions in WileyPLUS Assignment 11
November 19	Sunday	**WIleyPLUS Assignment 11 Due 11:45 PM**
November 20	Lecture 33 Chapter 14.4-14.6 Concentration of Solution, Colligative Properties, Osmosis	
November 21	No Recitations	
November 22	Thanksgiving Break	
November 24	Thanksgiving Break	
November 26	Sunday Thanksgiving Break	No Homework
November 27	Lecture 34 Chapter 15.1-15.4 Acids,Bases, Salts, Reactions of Acids and Bases, Electrolytes and Nonelectrolytes	Work on Chapter 15.1-15.4 questions in WileyPLUS Assignment 12
November 28	Recitation 10	
November 29	Lecture 35 Chapter 15.5-15.7 pH, Neutralization, Net Ionic Equations	Work on Chapter 15.1-15.4 questions in WileyPLUS Assignment 12
December 1	Lecture 36 Chapter 16.1-16.4 Chemical Equilibrium, Le Chatelier's Principle, Equilibrium Constant	Work on Chapter 16.1-16.4 questions in WileyPLUS Assignment 12
December 3	Sunday	
December 4	Lecture 37 Chapter 16.5-16.8 Ion Product Constant for Water, Ionization Constants, Solubility Product Constant, Buffers	**WIleyPLUS Assignment 12 Due 11:45 PM**
December 5	Recitation 11	
December 6	Lecture 38 Midterm 4 Review	
December 8	Lecture 39 **Midterm 4**	
December 10	Sunday	No Homework
December 11	Lecture 40 Last Day of Lectures Class Assessment	

Date	Lecture	Homework
December 12	Final Recitation 12	
December 19	**Final Exam Noon Lecture 8:00-10:00 AM ULH 10** **Final Exam 2 PM Lecture 1:10-3:10 PM NULH**	