

CHMY 121N Introduction of General Chemistry Autumn 2016 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 10:00 am to 3:00 pm
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. The custom version 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 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 \$112.50. 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 **525849**. The course name is **121: INTRO CHEM (GOB), Fall 2016 DAN DWYER Fall 2016**
- **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, North Underground Lecture Hall

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 13 recitation periods 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. 100 points on the homework will be considered a perfect score. Any points above 100 will be considered bonus points toward your total points for the class. 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 is *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 =	<u>200 points</u>
Total		800 points

The actual number of recitations is 13 and the actual number of WileyPlus assignments is 12. Therefore, it is possible to achieve a total of 50 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 – 738 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.

A grade of audit (AUD) is recorded for all students who register in courses as auditors, intending to listen to the courses without earning credit or being graded. Any student who initially enrolls as an auditor or changes his or her grade option to audit (on or before September 19th) may listen to the entire course or any part thereof at their discretion and will be issued a final grade of AUD.

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 19th 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.

October 31st is the last day to drop with the signatures of your advisor and the instructor with W appearing on your transcript.

After October 31st, 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 2016 Calendar

Date	Lecture	Homework
August 29	Lecture 1 Chapter 1 Scientific Method, States of Matter Classification of Matter	Work on Chapter 1 questions in WileyPLUS Assignment 1
August 30	No Recitation	
August 31	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 2	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 4	Sunday	
September 5	Labor Day No Class	
September 6	Recitation 1	WileyPLUS Assignment 1 due at 11:55 PM Do Orion Self-Assessment Chapter 1

Date	Lecture	Homework
September 7	Lecture 4 Chapter 3 Elements, Periodic Table, Compounds, Chemical Formula	Work on Chapter 3 questions in WileyPLUS Assignment 2
September 9	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
September 11	Sunday	WileyPLUS Assignment 2 Due 11:45 PM Do Orion Chapters 3 and 4
September 12	Lecture 6 Chapter 5.1 - 5.4 Dalton's Atom, Electric Charge, Subatomic Parts of Atom, Nuclear Atom	Work on Chapter 5.1-5.4 questions in WileyPLUS Assignment 3
September 13	Recitation 2	
September 14	Lecture 7 Chapter 5.5-5.6 Isotopes, isotopic notation, mass number of isotopes, atomic mass	Work on Chapter 5.5-5.6 questions in WileyPLUS Assignment 3
September 16	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 19	Monday	WileyPLUS Assignment 3 Due 11:45 PM
September 19	Lecture 9 Chapter 6.4-6.5 Nomenclature II, Compounds with Polyatomic Ions, Acids	Do Orion Chapter 5 and 6
September 20	Recitation 3	
September 21	Midterm 1 Review	
September 23	Midterm 1 Chapter 1-6	
September 25	Sunday	
September 26	Lecture 12 Chapter 7.1 The Mole and Avogadro's Number	Work on Chapter 7.1 questions in WileyPLUS Assignment 4
September 27	Recitation 4	
September 28	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 4
September 30	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 4
October 2	Sunday	WileyPLUS Assignment 4 Due 11:45 PM Do Orion Chapter 7
October 3	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 4	Recitation 5	

Date	Lecture	Homework
October 5	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 5
October 7	Lecture 17 Chapter 9.1-9.4 Stoichiometry I Mass to Mass Stoichiometry	Work on Chapter 9.1-9.4 questions in WileyPLUS Assignment 5
October 9	Sunday	
October 10	Lecture 18 Chapter 9.5- Limiting Reactant, Percent Yield	WileyPLUS Assignment 5 Due 11:45 PM Do Orion Chapter 8 and 9
October 11	Recitation 6	
October 12	Midterm 2 Review	
October 14	Midterm 2 Chapter 7-9	
October 16	Sunday	
October 17	Lecture 21 Chapter 10.1-10.3 Atomic Theory I, Electromagnetic Radiation, Bohr Model of Atom, electron energy configurations	Work on Chapter 10.1-10.3 questions in WileyPLUS Assignment 6
October 18	Recitation 7	
October 19	Lecture 22 Chapter 10.4-10.5 Atomic Theory II, Electron Structure and Periodic Table	Work on Chapter 10.4-10.5 questions in WileyPLUS Assignment 6
October 21	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 6
October 23	Sunday	WileyPLUS Assignment 6 Due 11:45 PM Do Orion Chapter 10
October 24	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 7
October 25	Recitation 8	
October 26	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 7
October 28	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 7
October 30	Sunday	WileyPLUS Assignment 7 Due 11:45 PM Do Orion Chapter 11
October 31	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 8
November 1	Recitation 9	

Date	Lecture	Homework
November 2	Lecture 28 Chapter 13.1-13.4 Liquids, Surface Tension, Vapor Pressure, Melting Point, Boiling Point, Heating Curves	Work on Chapter 13.1-13.4 questions in WileyPLUS Assignment 8
November 4	Lecture 29 Chapter 13.5-13.7 Intermolecular Forces, Hydrates, Water	Work on Chapter 13.5-13.7 questions in WileyPLUS Assignment 8
November 6	Sunday	WileyPLUS Assignment 8 Due 11:45 PM Do Orion Chapter 12
November 7	Lecture 30 Chapter 14.1-14.3 Solutions, Solubility, Rates of Dissolution	Work on Chapter 14.1-14.3 questions in WileyPLUS Assignment 9
November 8	National Election No Recitation	
November 9	Lecture 31 Chapter 14.4-14.6 Concentration of Solution, Colligative Properties, Osmosis	Work on Chapter 14.4-14.6 questions in WileyPLUS Assignment 9
November 11	Veteran's Day No Class	
November 13	Sunday	WileyPLUS Assignment 9 Due 11:45 PM Do Orion Chapter 13
November 14	Midterm 3 Review	Do Orion Chapter 14
November 15	Recitation 10	
November 16	Midterm 3 Chapters 10-14	
November 18	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 10
November 20	Sunday	WileyPLUS Assignment 10 Due 11:45 PM
November 21	Lecture 35 Chapter 15.5-15.7 pH, Neutralization, Net Ionic Equations	Work on Chapter 15.5-15.7 questions in WileyPLUS Assignment 11
November 22	Recitation 11	
November 23- 25	Thanksgiving Break No Classes	
November 27	Sunday	WileyPLUS Assignment 11 Due 11:45 PM Do Orion Chapter 15
November 28	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
November 29	Recitation 12	

Date	Lecture	Homework
November 30	Lecture 37 Chapter 16.5-16.8 Ion Product Constant for Water, Ionization Constants, Solubility Product Constant, Buffers	Work on Chapter 16.5-16.8 questions in WileyPLUS Assignment 12
December 2	Lecture 38 Chapter 18.1-18.4 Nuclear Chemistry, Discovery of Radioactivity, Alpha, Beta, Gamma Emission, Measurement of Radioactivity	Work on Chapter 18.1-18.4 questions in WileyPLUS Assignment 12
December 4	Sunday	
December 5	Lecture 39 Chapter 18.5-18.7 Nuclear Energy, Mass energy Relationship, Biological Effects of Radiation	WileyPLUS Assignment 12 Due 11:45 PM Do Orion Chapters 16 and 18
December 6	Recitation 13	
December 7	Midterm 4 Review	
December 9	Midterm 4	
December 12	Last Day of Classes Class Assessment	
December 15	Final Exam Section-10 (noon class) 8:00-10:00 AM ULH 101 Final Exam Section-00 (2:00 PM Class) 1:10-3:10 NULH	