

Spring 2-1-2018

# CHMY 121N.00: Introduction to General Chemistry

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**CHMY 121N Introduction of General Chemistry**  
**Spring 2018**  
**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**

Professor Dan Dwyer,  
daniel.dwyer@umontana.edu  
Office: Chemistry 206

**Office Hours**

Monday: 10:00 am to 2:00 pm  
Tuesday: 10:00 am to 12:00 noon  
Wednesday: 10:00 am to 2:00 pm  
Friday: 10:00 am to 12:00 noon  
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](http://www.wileyplus.com). The six digit course ID is 627520. The course name is **INTRO CHEM 121 Spring 2018 Instructor DAN DWYER**
- **A scientific calculator**. Your calculator needs to be able to handle logs and exponents.

## ***Lecture***

MWF 9:00 AM– 9:50 AM, Urey Lecture Hall.

Each regular lecture will be used to introduce new material and to work on problems in groups.

## ***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 your 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 10% 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>
<b>Total</b>		<b>800 points</b>

***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***

February 9<sup>th</sup> 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.

April 2<sup>nd</sup> is the last day to drop with the signatures of your advisor and the instructor with W appearing on your transcript.

May 4<sup>th</sup>, 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](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 Spring 2018 Calendar

Date	Lecture	Homework
January 22	Lecture 1 Chapter 1 Scientific Method, States of Matter Classification of Matter	Work on Chapter 1 questions in WileyPLUS Assignment 1
January 23	Recitations do not meet	
January 24	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
January 26	Lecture 3 Chapter 2.5-2.8 Metric System, Dimensional Analysis, Density	Work on Chapter 2.5-2.8 questions in WileyPLUS Assignment 1
January 28	Sunday	<b>WileyPLUS Assignment 1 due at 11:55 PM</b>
January 29	Lecture 4 Chapter 3 Elements, Periodic Table, Compounds, Chemical Formula	Work on Chapter 3 questions in WileyPLUS Assignment 2
January 30	<b>Recitation 1</b>	

January 31	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
February 2	Lecture 6 Chapter 5.1 - 5.4 Dalton's Atom, Electric Charge, Subatomic Parts of Atom, Nuclear Atom	
February 4	Sunday	<b>WileyPLUS Assignment 2 Due 11:45 PM</b>
February 5	Lecture 7 Chapter 5.5-5.6 Isotopes, isotopic notation, mass number of isotopes, atomic mass	
February 6	<b>Recitation 2</b>	
February 7	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
February 9	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
February 11	Sunday	<b>WileyPlus Assignment 3 Due 11:45 PM</b>
February 12	Lecture 10 Midterm 1 Review	
February 13	<b>Recitation 3</b>	
February 14	Lecture 11 <b>Midterm 1</b>	
February 16	Lecture 12 Chapter 7.1 The Mole and Avogadro's Number	Work on Chapter 7.2-7.3 questions in WileyPLUS Assignment 4
February 18	Sunday	<b>WileyPLUS Assignment 4 Due 11:45 PM</b>
February 19	<b>Presidents Day</b>	<b>No Classes</b>
February 20	<b>Recitation 4</b>	
February 21	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
February 23	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
February 25	Sunday	<b>WileyPLUS Assignment 5 Due 11:45 PM</b>
February 26	Lecture 15 Chapter 8.1-8.2 Chemical Equations, Balancing Chemical Equations	Work on Chapter 8.1-8.2 questions in WileyPLUS Assignment 5
February 27	<b>Recitation 5</b>	

February 28	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
March 2	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
March 4	Sunday	
March 5	Lecture 18 Chapter 9.5- Limiting Reactant, Percent Yield	
March 6	<b>Recitation 6</b>	<b>WileyPLUS Assignment 6 Due 11:45 PM</b>
March 7	Lecture 19 Midterm 2 Review	
March 9	<b>Lecture 20 Midterm 2 Chapter 6-9</b>	
March 11	Sunday	<b>No Homework</b>
March 12	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
March 13	Recitation 7	
March 14	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
March 16	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
March 18	Sunday	<b>WileyPLUS Assignment 7 Due 11:45 PM</b>
March 19	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
March 20	<b>Recitation 8</b>	
March 21	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 8
March 23	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 8
March 26- March 30	<b>Spring Break</b>	<b>No Classes</b>
April 1	Sunday	<b>WileyPLUS Assignment 8 Due 11:45 PM</b>
April 2	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
April 3	<b>Recitation 9</b>	<b>WileyPLUS Assignment 9 Due 11:45 PM</b>



April 4	Lecture 28 Midterm 3 Review	
April 6	Lecture 29 <b>Midterm 3</b>	
April 8	Sunday	No Homework
April 9	Lecture 30 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
April 10	<b>Recitation 10</b>	
April 11	Lecture 31 Chapter 13.5-13.7 Intermolecular Forces, Hydrates, Water	Work on Chapter 13.5-13.7 questions in WileyPLUS Assignment 10
April 13	Lecture 32 Chapter 14.1-14.3 Solutions, Solubility, Rates of Dissolution	Work on Chapter 14.1-14.3 questions in WileyPLUS Assignment 10
April 15	Sunday	<b>WileyPLUS Assignment 10 Due 11:45 PM</b>
April 16	Lecture 33 Chapter 14.4-14.6 Concentration of Solution, Colligative Properties, Osmosis	
April 17	<b>Recitation 11</b>	
April 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 12
April 20	Lecture 35 Chapter 15.5-15.7 pH, Neutralization, Net Ionic Equations	Work on Chapter 15.1-15.4 questions in WileyPLUS Assignment 12
April 22	Sunday	<b>WileyPLUS Assignment 11 Due 11:45 PM</b>
April 23	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
April 24	<b>Recitation 12</b>	
April 25	Lecture 37 Chapter 16.5-16.8 Ion Product Constant for Water, Ionization Constants, Solubility Product Constant, Buffers	
April 27	Lecture 38 Midterm 4 Review	
April 29	Sunday	<b>WileyPLUS Assignment 12 Due 11:45 PM</b>
April 30	Lecture 39 <b>Midterm 4</b>	
May 1	Final Recitation	
May 2	Lecture 40 Chapter 17 Nuclear Chemistry	
May 4	Lecture 41 Last Day of Lectures Class Assessment	
<b>May 8</b>	<b>Final Exam :10-12:10 AM ULH 101</b>	