

# Chemistry 105

## Fall 2017

### I. INSTRUCTORS AND CONTACT INFORMATION

#### Lead Instructors

Name	Email	Office	Telephone
<b>Dr. Jonathan Gutow</b> <i>Lecture A (all sections)</i> <i>T/Th 9:40-11:10 AM</i>	gutow@uwosh.edu	HS-412	424-1326
<b>Dr. Yijun Tang</b> <i>Lecture B (all sections)</i> <i>T/Th 1:20-2:50 PM</i>	tangy@uwosh.edu	HS-442	424-7097

#### Additional Lab and Discussion Instructors

<b>Dr. Christopher Bianchetti</b>	bianchec@uwosh.edu	HS-417	424-2039
<b>Dr. Michael Foley</b>	foleym@uwosh.edu	HS-440	424-1314
<b>Dr. Sharon Hawi</b>	hawi@uwosh.edu	HS-443	424-1029
<b>Dr. Sheri Lense</b>	lenses@uwosh.edu	HS-414	424-3476
<b>Dr. James Paulson</b>	paulson@uwosh.edu	HS-418	424-7100
<b>Dr. Lauren Waters</b>	watersl@uwosh.edu	HS-408	424-7099

**Office Hours:** All instructors will have regularly scheduled times when they will be available for questions. This information will be provided by each instructor during your first meeting with them. Once all office hours are determined the information will be made available through D2L.

**Course Registration** and advising are managed by Chemistry's Academic Department Associate.

Office: HS-432

Phone: 424-1400

## II. REQUIRED COURSE MATERIALS

Textbook: Read the following information carefully before you decide which textbook to buy. Consult your instructor if you have any questions.

*Required:*

Chemistry. Published by OpenStax.

- The instructor will only refer to this book in lectures.
- You can get a PDF file of this textbook **free** from [openstax.org/subjects](https://openstax.org/subjects).  
**Note:** There are two chemistry books. The orange one is used in this course. (The green one is called “Chemistry: Atoms First” which is not the book required.)
- (Optional) If you want a hard copy of this textbook, follow the link on [openstax.org](https://openstax.org) website. It costs \$55 on Amazon.

*Recommended:*

The following book covers all topics of this course (Chem 105, General Chemistry I). If you choose to use this text the course schedule does list the appropriate readings for each topic. This text is the required textbook of General Chemistry II (Chem 106) in Spring 18.

General Chemistry: The Essential Concepts

Chang and Goldsby, 7<sup>th</sup> Edition, McGraw-Hill, © 2014.

(The current edition is 7<sup>th</sup> edition. We do not know if or how soon a newer edition will come out.)

Course Manual: Available from the bookstore. This contains a copy of this syllabus and laboratory handouts.

Lab notebook: It must be bound and have duplicate pages (carbonless copying). It may **NOT** be spiral bound. It can be used both for Chem 105 and Chem 106.

Online Homework: Section A link: CHEM 105 – Fall17 – GUTOW  
[www.saplinglearning.com/ibiscms/course/view.php?id=69531](https://www.saplinglearning.com/ibiscms/course/view.php?id=69531)

Section B link: CHEM 105 – Fall17 – TANG  
[www.saplinglearning.com/ibiscms/course/view.php?id=69518](https://www.saplinglearning.com/ibiscms/course/view.php?id=69518)

You need to buy the access to Sapling Learning. The access costs \$40.00 and has a grace period of 14 days from the first day of class. Once you have registered and enrolled, you can log in at any time to complete or review your homework assignments. During sign-up or throughout the term, if you have any technical problems or grading issues, send an email to [support@saplinglearning.com](mailto:support@saplinglearning.com)

explaining the issue. The Sapling Learning support team is almost always faster and better able to resolve issues than your instructor.

There are two types of homework.

- Practice Homework  
Each practice homework assignment is due before the lecture. You will earn 2 points on each assignment as long as you finish it. You can earn a maximum of 25 points throughout the semester. The practice homework helps you to prepare for the lecture.
- Timed Homework  
Questions in the timed homework are similar to those in the practice homework. You can earn as many as 10 points each assignment. The questions and time limit will be chosen to provide realistic practice for exams.

Goggles: Indirect vented safety goggles (must bear the number Z87.1) are required. State law requires that goggles be worn at all times during the lab. They are available at the bookstore, at the Chemistry stockroom, and from the UW Oshkosh Chemistry Club. **No goggles? No lab!**

Calculator: Any make with scientific notation, powers, roots, and logarithms. A graphing calculator is **not** necessary. You should bring it with you to all lectures & exams. You may wish to buy a very inexpensive calculator to take to lab with you. Cell phones and other internet-enabled devices will not be allowed as calculators on tests and quizzes. *You are not permitted to program any information into your calculator for an exam.*

Clicker: You must purchase a Turning Technologies clicker from the University bookstore or buy one used from another student and pay to register it for the course.

### III. COURSE OVERVIEW & OBJECTIVES

Chemistry 105 is the first part of a two-semester chemistry course for science majors. It also meets requirements for chiropractic/dental/medical/pharmacy/physical therapy/veterinary programs and secondary education/science emphasis majors. Chemistry 105 provides an introduction to the structure and composition of matter. It also fulfills a natural science requirement for the University's general education program.

This course is intended to introduce the student to the language and the elementary theories of chemistry, to provide training and practice in analytical reasoning and problem

solving, and to serve as the basis for further studies in chemistry. The lab portion is designed to provide training in the experimental techniques of chemistry, and to reinforce lecture material with concrete experience. Students will increase their knowledge of the physical world and develop valuable skills including critical thinking, written and oral communication, quantitative literacy, technical literacy, information literacy, teamwork, and problem solving.

### ***Description of Course Components***

Each week you will have at least four ways to learn chemistry. Success in this fast-paced and challenging course requires good attendance and a significant investment of time in addition to scheduled class hours. You are encouraged to visit the instructors during office hours to clear up points of confusion or to explore topics beyond the scope of the textbook.

Homework: Two types of online homework will be assigned using Sapling Learning system: 1) practice exercises that you get credit for trying before the material is covered in lecture; 2) graded time-limited quizzes on material we have covered in class, which will be due roughly weekly.

The graded quizzes will give you an indication of what to expect in an exam situation. The practice exercises will be on upcoming material. To get credit you should complete them before each class. This will help you figure out what to ask about in class. Plan to skim the reading before it is presented in lecture, particularly noting the list of concepts and skills to review. Use the practice exercises to determine where you need to focus your learning efforts. After each lecture, review your notes and re-read the appropriate textbook sections. Work through sample and follow-up problems as you go along. Additional practice problems, with answers, can be found in the textbook at the ends of chapters.

After finishing each chapter, use the *key terms*, *key equations* and the *summary* as a study guide. Be sure you can apply the key terms and equations.

Lecture: Lectures are given Tuesdays and Thursdays in HS109. In lecture you will listen to descriptions of important concepts, take notes, and use your “Clicker” to participate in interactive exercises.

Discussion: Discussion sections provide an opportunity to reinforce lecture material in a smaller group setting. Class time will be spent working in small groups on worksheets provided by the instructor, or participating in group activities. Occasionally, new material will be presented, which will not be re-covered in lecture, but **will** be on the exams and quizzes. Four quizzes will be given in discussion (see schedule).

Laboratory: “Hands-on” laboratory work is an essential part of chemistry. In the lab you will experience directly some of the relationships discussed in the lecture, learn experimental techniques, and solve chemical problems. You will learn to use scientific instruments, and make careful observations. Bring your lab manual, lab notebook, and calculator to the laboratory. The dress code for lab includes safety goggles, long pants,

long or short sleeved shirts, and closed shoes. Your shirt and pants must overlap. Pants should not touch the floor. Long hair must be tied back. Do not bring food or beverages to the lab (not even gum). Additional safety regulations will be discussed at the first lab. Students who do not follow the safety rules will lose some of the lab work points, and may be asked to leave the laboratory.

**\*\*Anyone who is pregnant or who has a history of allergies MUST see the instructor BEFORE entering the lab to do any work.**

*Peer Educator Sessions:* A peer educator, a student who has successfully completed Chem 105 and 106, will offer an optional weekly problem-solving session. The time and location will be announced once the semester has begun.

*Tutoring:* The UW Oshkosh Center for Academic Resources offers free, confidential tutoring to all UWO students. CAR is located in the Student Success Center, suite 102. Check their website [www.uwosh.edu/car](http://www.uwosh.edu/car) for more information or to contact a tutor. Many students have used this in the past and found it extremely helpful!

#### IV. GRADING SYSTEM

##### A. Attendance

Regular attendance is essential to successfully passing the course. An **unexcused** absence during a scheduled quiz or exam in any part of the course will result in a zero-point score for that quiz or exam. There are **no makeup quizzes or exams**.

The reason for any **excused** absence from an exam, quiz, or laboratory session must be presented to your instructor (in advance if possible) and substantiated **in writing** with the student's signature. Emailed excuses are NOT enough. Assignments and tests missed for a valid reason will not be counted against you, but you will be responsible for material covered in your absence. Advance notice of a pending absence will often make it possible to arrange for an alternate time for a quiz, exam or attendance in another lab section. **If you miss more than one exam for any reason, you will receive an incomplete or a failing grade depending on the circumstances.**

##### B. Course Prerequisite

Credit for or concurrent enrollment in Math 104, College Algebra

##### C. Point Distribution

	Points
Exams (4 exams @ 120 pts).....	480
Discussion (4 quizzes @ 25 points each).....	100
Timed Homework (10 homeworks @ 10 pts each) .....	100
Practice Homework (2 pts ea up to 25 pts, ~40 pts available).....	25
Clicker Questions (1 pt ea to 25 pts, ~ 50 pts available).....	25
Laboratory .....	180
<b>Total</b>	<b>910</b>

#### D. Grading Scale

The minimum percentage necessary for each grade range is listed below. These cutoffs will not be adjusted upward, but the instructor reserves the right to lower them.

Minimum percentage	Minimum total points	Letter grade
0 %	0	F
52 %	473	D-
56%	510	D
60%	546	D+
63%	573	C-
66%	601	C
70%	637	C+
74%	673	B-
79%	719	B
83%	755	B+
89%	810	A-
91%	828	A

Grades will be posted on D2L as they become available, so you may check your current course grade at any time during the semester. It is your responsibility to verify that all scores are entered properly. Misgraded quizzes or exams must be returned to your instructor for possible regrading no later than one week following their return. You are responsible for checking that your final score is correct. Save all work until the final course grade has been determined.

#### E. Laboratory Grade

Laboratory work is completed in small groups to assist students in gaining teamwork and leadership skills. Points are earned individually, however, through pre-lab assignments, accurate record-keeping, post-lab data analysis, and lab quizzes.

**Attendance in laboratory is mandatory. Two unexcused absences from lab or unsuccessful completion of the laboratory component will result in a failing grade for this course, regardless of exam scores.** If you miss a lab, you may attend another lab during the same week, if space allows. **To attend another lab session you must verify the switch with both your normal lab instructor and the instructor of the lab you will attend.** Do not expect laboratory experiences to directly correlate with lecture.

#### F. Discussion Grade

Four quizzes will also be administered in discussion sections. These quizzes will be based on the previous material. A maximum of 100 quiz points may be accumulated throughout the semester. Make-up quizzes will not be offered. If you know you are going to miss a discussion, please contact your instructor. You may be able to attend another discussion section.

### G. Online Homework Grade

Online homework assignments (including practice homework and timed homework) will also be due throughout the semester. The total possible points for these assignments are 125. It is your responsibility to gain access to the homework site and to complete the assignments before the due date.

### H. Clicker Grade

You will receive one point for each clicker question answered correctly; up to a maximum of 25 (at least 50 will be asked over the course of the semester).

### I. Exam Schedule and Policy

Four 90-minute exams will be given. Bring your own calculator for the test. The first three will be held over two days. You will take the exam either during your scheduled class time or at the Testing Center in the basement of Polk Library. You will need your student ID in order to take the exam at the Testing Center.

Dates for the four 90-minute exams:

Exam	Dates	Location
1	Thursday and Friday, September 28 <sup>th</sup> & 29 <sup>th</sup>	Testing Center or lecture hall
2	Thursday and Friday, October 19 <sup>st</sup> & 20 <sup>st</sup>	Testing Center or lecture hall
3	Monday and Tuesday, November 13 <sup>th</sup> & 14 <sup>th</sup>	Testing Center or lecture hall
4	Thursday, December 14 <sup>th</sup>	HS-107 or HS-109

#### Polk Testing Center

Exam 1 Sept. 28<sup>th</sup> & Sept. 29<sup>th</sup>, 8am - 6pm  
Exam 2 October 19<sup>th</sup> & 20<sup>st</sup>, 8am - 6pm  
Exam 3 November 13<sup>th</sup> & 14<sup>th</sup>, 8am - 6pm  
Exam 4

#### Lecture Hall

or Sept. 28<sup>th</sup> in regular lecture period  
or Oct. 19<sup>st</sup> in regular lecture period  
or Nov. 13<sup>th</sup> in regular lecture period  
Dec. 14<sup>th</sup> in regular lecture period

The computer scan sheets for multiple choice exams will not be returned to you. Make sure you record your answers on the exam as well as the scan sheet. You must check the posted answer keys to verify that your score was entered properly.

No radios, MP3 players, headsets or other recording or transmitting devices may be used during exams. Caps with bills must have bills turned to back of head.

Early exams will be offered for students who cannot attend the exam during the scheduled day. Students who need to take an early exam must sign up with the instructor the week before the exam.

Exams will be computer scored and the answer sheet will not be returned to you, but retained by the lecturer for a permanent record. Answer keys will be posted on the bulletin board outside HS-403 and on D2L.

## V. COURSE POLICIES

**Classroom Decorum**- Be courteous to your fellow classmates. While pertinent questions are encouraged, **talking and whispering during lecture are disruptive and annoying to nearby students** trying to listen to the lecture.

**Cell Phones** must be turned off and put away. This means absolutely no “texting” during class.

**Computers** may be used to take notes, but **do not use them for e-mail, videos, game playing, etc. during class as it is disruptive and annoying to nearby classmates** trying to listen to the lecture.

**Email etiquette** – I will happily respond to your emails as fast as I can, but please be sure to include in the subject “CHEM105:XXXX” so that I know what the email is referring to, as much information as you can provide me about what you are asking, and your name. I will not respond to emails that include “text speak”.

### **Academic Dishonesty**

The University of Wisconsin-Oshkosh is built upon a strong foundation of integrity, respect, and trust. All members of the university community have a responsibility to be honest and the right to expect honest from others. Any form of academic dishonesty is unacceptable to our community and will not be tolerated.

As college students (and adults) you are expected to observe high standards of integrity and honesty. Students caught cheating on exams, quizzes, or in the laboratory are subject to a grade of F for the course and a report being placed in their academic records. A second offense is likely to result in expulsion from the University.

### **General Comments**

This course is a 5-credit course. This means that it should require almost twice the amount of work required in a 3-credit course. You should not be surprised if you spend more time on this course than some of your other courses.

Probably the most important thing you can do to improve your performance and grade in this course is to keep up with the assigned reading and homework problems. In general:

- Read the textbook assignment before the lecture on that material.
- Attend lectures and take clear lecture notes.
- After lecture re-read the appropriate textbook pages and update/recopy your notes.
- Work the assigned problems promptly as the material is covered.
- Seek help if you do not understand the material or are unable to work a problem.
- Write summaries/make flashcards.

- Study for the exams by re-reading the textbook material, going over the lecture notes/summaries, and reworking the problem assignments many times.

NOTE: The last date to drop this course without a Late Add/Drop Request Form is **Friday, October 20th**. Students dropping the course must check out of lab before the drop is considered complete.

### **Additional University Resources**

*Dean of Students Office:* This is the office to contact ([www.uwosh.edu/deanofstudents](http://www.uwosh.edu/deanofstudents)) if you have a serious issue that impacts your ability to meet your academic obligations. They can provide you with accurate advice on your options and serve as a single contact point so that you do not initially need to contact each instructor individually.

*Writing Center:* The Writing Center ([www.uwosh.edu/wcenter](http://www.uwosh.edu/wcenter)) helps students of all ability levels improve their writing. Trained peer consultants help writers understand an assignment, envision possibilities for a draft, and improve their writing process. They even help writers learn to identify their own proofreading errors.

*Reading Study Center:* The Reading Study Center ([www.uwosh.edu/readingstudycenter](http://www.uwosh.edu/readingstudycenter)) is an all-university service whose mission is to facilitate the development of efficient college-level learning strategies in students of all abilities. The center offers strategies for improved textbook study, time management, note-taking, test preparation, and test-taking.

## TENATIVE COURSE SCHEDULE

Chapters in OpenStax Chemistry  
*Chapters in Chang's*

Week Beginning	Laboratory (Days vary)	Lecture (Tuesday)	Discussion (Wednesday)	Lecture (Thursday)
September 4	No Lab	–	Introduction Syllabus Quiz <b>1.1 – 1.4</b> <u>1.1-1.4</u>	Atoms, Isotopes, Atomic Mass, Mass Spectrometer <b>2.1 – 2.3, 2.5</b> <u>2.1 – 2.4, 3.1, 3.4</u>
September 11	Check-in, Safety, Significant Digits Worksheet <b>1.5</b> <u>1.6</u>	Chemical Formulas, Molecules, Ions <b>2.4, 2.6, 2.7</b> <u>2.5 – 2.7</u>	Naming Practice, Dimensional Analysis Worksheet <b>1.6</b> <u>1.7</u>	Formula & Molecular Mass, Chemical Reactions <b>3.1, 4.1</b> <u>3.1 – 3.3, 3.7</u>
September 18	How Dense is an Egg?	Limiting Reagents & % Yields <b>4.3 – 4.4</b> <u>3.8 – 3.10</u>	<b>Quiz 1</b> Limiting Reagent & % Yields Worksheet <b>4.1, 4.3 – 4.4</b> <u>3.7 – 3.10</u>	Solutions, Molarity, Precipitation Reactions <b>3.3, 4.2</b> <u>4.1, 4.2, 4.5</u>
September 25	Water Hardness	Acid Base Reactions, Redox Reactions (not balancing), Titrations <b>4.2, 4.5</b> <u>4.3, 4.4, 4.6</u>	Oxidation State Worksheet + Review	Exam #1 Thursday & Friday
October 2	Acid Base Titration	Energy, Heat, Calorimetry <b>5.1 – 5.2</b> <u>6.1, 6.2, 6.5</u>	Heat calculations & Intro to Enthalpy Worksheet <b>5.3</b> <u>6.3, 6.4</u>	Enthalpy <b>5.3</b> <u>6.4</u>
October 9	Thermochem I	Standard Enthalpies <b>5.3</b> <u>6.6</u>	<b>Quiz 2</b> Entropy and $\Delta G$ Worksheet	Entropy, Spontaneity, $\Delta G$ (no equilibrium) <b>16.1 – 16.4</b> <u>18.1 – 18.5</u>
October 16	Thermochem II	$\Delta G$ , Coupled Reactions/Biological Systems supplement?	$\Delta G$ and coupled reactions + Review	Exam #2 Thursday & Friday
October 23	Gases	Gas Laws <b>9.1 – 9.2</b> <u>5.1 – 5.4</u>	Gas Laws	Gas Stoichiometry, KM Theory, Real Gases <b>9.3, 9.5, 9.6</b> <u>5.4, 5.6, 5.7</u>
October 30	Atomic Emission	Quantum Theory <b>6.1 – 6.3</b> <u>7.1 – 7.7</u>	<b>Quiz 3</b> Atomic Structure (Shells) Worksheet	Electronic Configurations <b>6.4</b>
November 6	Lab Quiz 1 & Start Periodic Properties	Electronic Configurations, Periodic Properties <b>6.4, 6.5</b> <u>8.1 – 8.3</u>	Electronic Configurations Worksheet	Periodic Properties + Review <b>6.5</b> <u>8.3 – 8.5</u>
November 13	Finish Periodic Properties	Exam #3 Monday & Tuesday	Lewis Structures Worksheet	Bonds, Lewis Structures, Octet Exceptions <b>7.1 – 7.3</b> <u>9.1, 9.2, 9.4 – 9.6, 9.9</u>
November 20	–	Octet exceptions, Formal Charge, Resonance + Review <b>7.3, 7.4</b> <u>9.9</u>	THANKSGIVING BREAK	
November 27	Dyes and Intermolecular Forces	Molecular Geometry <b>7.6</b> <u>10.1, 10.2</u>	Molecular Geometry and Hybridization Worksheet	Hybrid Orbitals, Sigma- & Pi- bonds
December 4	Lab Quiz 2 Checkout	Intermolecular Forces, Liquids <b>10.1 – 10.2</b> <u>12.1 – 12.3</u>	<b>Quiz 4</b> Intermolecular Forces Worksheet	Phase Changes <b>10.3 – 10.4</b> <u>12.6</u>
December 11	–	Solids <b>10.5 – 10.6</b> <u>12.4, 12.5, 12.7</u>	Review	Exam #4 Thursday

## Syllabus “Quiz”

I, the undersigned, confirm that I have received, read, and understand my duties and responsibilities as stated in the syllabus for Chem105 for the Fall semester of the 2017-2018 academic year.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Please print your name here: \_\_\_\_\_

Tell me about yourself!

Previous Chemistry Experience.

Any concerns that you might have about this course?

Any questions for me about the course?