

**Foundations of Chemistry:  
Chemistry 101**

**Fall 2019**

**Professor:** Dr. Sarah Smith  
**Office:** Jepson 440  
**Email:** ssmith23@umw.edu  
**Phone:** (540)-654-1409

**Lecture:** **Section 2:** MWF 12:00 – 12:50 p.m.; Jepson 454  
**Section 3:** MWF 1:00 -1:50 p.m.; Jepson 454

**Office Hours:**

M 10:00 – 11:00 am  
T 11:00 – 1:00 pm  
W 2:00 – 3:00 pm  
F 10:00 – 11:00 am or by appointment

**Required Materials:**

**Text:** Giancarlo, Leanna C. and Scott, Raymond B. *Foundations of Chemistry* available on Canvas (see below) as a downloadable electronic file. (You may print the text or use it as an eBook.)

**CHEM 101 Course Pack for Sections 2 and 3**

**ALEKS** (aleks.com: online learning tool); available through the Bookstore or directly from the website

**Calculator:** with scientific notation and logarithmic/exponential functions; you must purchase a Casio FX260 solar or TI-30X IIS for **ALL** examinations or an equivalent approved by the instructor. Cellular phones are not permitted on exam days.

**Web Site:** This course will make use of the Canvas course management system. Please check here frequently as materials posted will include course announcements, assignments, and other course materials as necessary.

**Course Description and Objectives:**

Chemistry is a quantitative science and is grounded in a mathematical and experimentally derived description of nature. This course is designed to develop fundamental mathematics skills and introduce foundational chemistry concepts for students intending to major in a scientific field and who will subsequently enroll in General Chemistry. Use of mathematics will be stressed in the context of chemical problems involving measurement, atoms, molecules, reactions (stoichiometry) and aqueous solutions.

The course is centered around development of critical thinking and problem-solving skills, especially those required to successfully navigate the “word problems” that comprise a mathematical and experimental science like Chemistry. Problem-solving skills and strategies are emphasized in accord with the numerical literacy inherent in the discipline. To succeed in this course, these problem-solving skills must be

practiced and developed. By attending lectures faithfully and completing the suggested practice problems and assignments, each student can begin to acquire the skills necessary to become a critical thinker. After completing the course, a student should

- Understand how to extract information from a chemical “word problem”
- Develop fundamental number skills related to solving chemical problems
- Be able to use information to solve problems related to chemical principles involving measurement, atomic structure, reactions (stoichiometry) and aqueous solutions

| <b>Grading:</b>                        | <b>Points</b>     |
|--|-------------------|
| 3 Hourly Exams at 100 points each      | 300               |
| Graded Team Activities                 | 180               |
| Aleks                                  |                   |
| Objectives                             | 120               |
| Completion of Pie chart                | 50                |
| In-Class Quizzes (5 at 20 points each) | 100               |
| Cumulative Final Exam                  | <u>250</u>        |
|  | 1000 points total |

Students with a C average or lower will receive a Mid-Semester Deficiency Report.

Extra credit will be awarded for **active** participation in PASS (see below). Students can earn 3 points per week for attendance and active involvement in a PASS section up to a total of 30 points extra credit over the entire semester.

Grades will be determined on the following point scale.

| <b>Points<br/>accumulated</b> | <b>Letter Grade</b> | <b>Points<br/>accumulated</b> | <b>Letter Grade</b> |
|-------------------------------|---------------------|-------------------------------|---------------------|
| ≥ 930 points                  | A                   | 769 – 730 points              | C                   |
| 929 – 900 points              | A-                  | 729 – 700 points              | C-                  |
| 899 – 870 points              | B+                  | 699 – 650 points              | D+                  |
| 869 – 830 points              | B                   | 649 – 600 points              | D                   |
| 829 – 800 points              | B-                  | below 600 points              | F                   |
| 799 – 770 points              | C+                  |                               |                     |

**In-Class Behavior:** Please act respectfully in class of other students and myself. This includes turning your cell phone, etc. off during class time, using electronic devices only for note taking purposes, and arriving to class on time. You are expected to participate in all activities and discussions. I reserve the right to dismiss you from class if I feel you are acting disrespectfully or are disrupting the class.

**Class Attendance:** Class attendance is highly recommended. The material discussed in lecture frequently has a different emphasis from that provided by the textbook. Also, time has been set aside in the course schedule to discuss example problems. Students are responsible for all covered materials during a missed class. Missed exams **cannot** be made up. Exams will be rescheduled in the event of an excused absence due to an emergency. (Immediate notification of the instructor is

mandatory). Lateness to lecture is distracting, and students should attempt to be on time. Lateness to an exam will result in less time allowed for completion of the exam.

**Absences:** You should notify me of an expected absence as early as possible. Make-up exams will not be given except in the event of EXTREMELY extenuating circumstances. If you must miss a quiz, see me as soon as possible *prior* to the quiz to arrange a time for a make-up quiz.

**Team Activities:** Occasional class periods, mostly Fridays, there will be a graded team activity to be completed by students in teams of 3 or 4. Teams will be chosen for each activity. The team activities are listed in the schedule given below. The activities must be submitted by the end of the class period and will be graded.

**ALEKS:** ALEKS (Assessment and LEarning in Knowledge Spaces) is an online, mastery based assessment and learning system that provides an efficient, effective, and engaging learning experience from McGraw-Hill Education. ALEKS uses artificial intelligence to determine precisely what you know, don't know, and are most ready to learn. You will take "quizzes" (complete learning objectives) using this platform. ALEKS will help you to

- Review topics and skills you need refreshing
- Practice new material that you are ready to learn
- Review and prepare for exams
- Track your performance and progress with personalized reports ("pie" chart)

There are six (6) scheduled ALEKS objective completion "quizzes" worth 20 points each due as indicated on the course calendar below by 8 am. The dates for these will not be changed. This accounts for 120 points of your ALEKS grade. In addition, you can earn up to 50 points for completion of the ALEKS pie December 9<sup>th</sup>, 2019 at 8 am. The points for the pie work as follows:

| Percentage of the ALEKS pie completed by the last day of class | Pie completion points |
|--|-----------------------|
| $\geq 95$  | 50 points             |
| 88 – 94  | 45                    |
| 80 – 87  | 40                    |
| 70 – 79  | 35                    |
| 60 – 69  | 30                    |
| 50 – 59  | 25                    |
| 40 – 49  | 20                    |
| 30 – 39  | 15                    |
| 20 – 29  | 10                    |
| 10 – 19  | 5                     |
| $\leq 10$  | 0                     |

**Quizzes:** Periodically, there will be a quiz given in class on current material. These in-class quizzes will examine your knowledge of fundamental concepts and math skills and typically take 15-20 minutes.

**Exams:** There will be three in-class exams during the semester which will emphasize material introduced since the last exam. There will be no make-up exams without prior arrangements with me.

The final exam will be cumulative and divided into 3 sections corresponding to the three semester exams. If you score better on one section of the final than you did on the semester exam corresponding to that section on the final, the grade from that section of the final exam will replace your grade on that exam.

**Exam Policies:** No cell phones or other personal electronic communication devices (including smart watches) will be permitted in the classroom during exams. You may only use approved non-graphing calculators for **ALL** quizzes and examinations.

If you feel a mistake has been made in the grading of your exam, you must write out what you wish to be re-graded and why (your reasoning is critical) on a separate sheet of paper. This must be turned in to me with the exam no later than one week after the graded exam is returned. Please note that the *entire* exam will be re-graded, and the new score (higher or lower) will be recorded.

If you feel there has been a numerical error in calculating your exam score, please bring this to my attention no later than one week after the graded exam is returned.

**Reading:** Reading of the appropriate sections of the textbook should be done *before* coming to class. You will be responsible for this material, *even if it is not covered in lecture*.

**PASS Sessions:** Peer-Assisted Study Sessions (PASS) are available for this course to assist you in better understanding of the course material. The PASS program provides peer-facilitated study sessions led by qualified and trained undergraduate leaders who attend the lectures with students and encourage students to practice and discuss course concepts in sessions. Sessions are open to all students and will focus on the most recent material covered in class. These sessions are not tutoring but rather sessions to compare class notes, review and discuss important concepts, develop appropriate strategies for studying, and prepare for exams. While attendance is free and voluntary, you may earn three extra credit points a week for attending a PASS session. This amounts to attending 10 out of the 14 weeks of the semester. You will not gain the points if you only go to the PASS sessions during the first three weeks of class or the last or only before exams. Your attendance must be more regular for you to benefit. In addition, for you to receive credit (the 3 points), you must be present for the entire PASS session. Students who are disruptive will lose credit for that session; continual disruptions will result in your removal from PASS for the rest of the semester and the denial of any extra credit points associated with your attendance.

**Honor System:** In accordance with the University's Honor Code, **All** graded work (hourly exams, online exercises, extra credit assignments, *graded* assignments, final exam) must be your own and pledged as such. (use **these** words)

*I hereby declare upon my word of honor that I have neither given nor received any unauthorized help on this work.* Signed

## **Academic dishonesty in any shape or form will not be tolerated.**

Suspected violations of the Honor Code will be addressed according to the policy established by the Honor Council. Please familiarize yourself with the University's policies on academic dishonesty: ignorance is not an excuse!

**Disability Services:** The Office of Disability Resources has been designated by the University as the primary office to guide, counsel, and assist students with disabilities. You will need to request appropriate accommodations through this office as soon as possible, and then make an appointment with me to discuss your approved accommodation needs. I will hold any information you share with me in the strictest confidence unless you give me permission otherwise.

**Title IX:** University of Mary Washington faculty are committed to supporting students and upholding the University's *Policy on Sexual and Gender Based Harassment and Other Forms of Interpersonal Violence*. Under Title IX and this Policy, discrimination based upon sex or gender is prohibited. If you experience an incident of sex or gender based discrimination, we encourage you to report it. ***While you may talk to me, understand that as a "Responsible Employee" of the University, I MUST report to UMW's Title IX Coordinator what you share.*** If you wish to speak to someone confidentially, please contact the below confidential resources. They can connect you with support services and help you explore your options. You may also seek assistance from UMW's Title IX Coordinator. Please visit <http://diversity.umw.edu/title-ix/> to view UMW's *Policy on Sexual and Gender Based Harassment and Other Forms of Interpersonal Violence* and to find further information on support and resources.

**Class Recordings:** Video and/or audio recording of class lectures and review sessions without the advance consent of the instructor is prohibited. On request, the instructor may grant permission for students to record course lectures, on the condition that these recordings are only used as a study aid by the individual making the recording. Unless explicit permission is obtained from the instructor, recordings of lectures and review sessions may not be modified and must not be transferred or transmitted to any other person, whether or not that individual is enrolled in the course. Students with approved accommodations from the Office of Disability Resources permitting the recording class meetings must present the accommodation letter to the instructor in advance of any recording being done. On any days when classes will be recorded, the instructor will notify all students in advance. Distribution or sale of class recordings is prohibited without the written permission of the instructor and other students who are recorded. Distribution without permission is a violation of educational law. This policy is consistent with UMW's Policy on Recording Class and Distribution of Course Materials.

### **How to Succeed in Chem 101:**

Success in chemistry requires considerable work on your part. Successful students typically spend a minimum of 1 hour per day on chemistry. This time is devoted to reviewing notes, attempting the suggested/assigned problems and reading ahead for the next lecture. Some of their "secrets" include (but are not limited to)

- reading the material prior to class.

- attending ALL lectures.
- taking good notes.
- asking questions. (The only “stupid” question is the one that goes unasked.)
- solving the suggested problems for each chapter. (Attempting extra problems is also a great idea. As in all aspects of life, “practice makes perfect”.)
- consulting your peers when you are struggling with the solution to a suggested problem. (First, they may have a different slant or see the problem in a different light. Second, scientists typically work in teams. Each member of the team is responsible for a particular aspect of the problem; therefore, each scientist must understand what each of the other members of the team does and have requisite background knowledge.)
- enlisting the aid of the instructor (office hours or appointments, before or after class).
- reviewing the appropriate sections of the text and all notes after class.
- attempting all suggested and assigned (team activity) problems by yourself
- reviewing topics from prerequisite courses.
- Attend PASS sessions regularly
- Review the appropriate sections of the text before class
- Review the appropriate sections of the text after class and organize your notes

**Course Schedule:** The tentative schedule that follows is how I see the course arranged. It is not concrete. If there is material that you, as a class, find confusing, we will spend more time on that topic. The exam dates will remain set according to the schedule. If all of the “scheduled” material has not been presented prior to the exam, the exam will include only what has been covered.

| UNIT ONE |  | UNIT TWO |  | UNIT THREE |                                      |
|----------|--|----------|--|------------|--------------------------------------|
| 1        | Active Learning, Introduction to Chemistry                                 | 5        | Introduction to Gases                              | 8          | Nomenclature (part 2), Molar Mass    |
| 2        | Atomic Theory, Matter, Units and Conversion Factors                        | 6        | Measuring Pressure and More Gases                  | 9          | Chemical Formula Determination       |
| 3        | Significant Figures  | 7        | Periodic Table, Atomic Mass and Isotopes, Graphing | 10         | Balancing Equations                  |
| 4        | Learning about Learning, Nomenclature (part 1), More on Conversion Factors | 8        | Exam Preparation                                   | 11         | Chemical Reactions and Net Equations |
|          |  |          |  | 12         | Stoichiometry                        |

|      |                      |      |                                |      |                   |
|------|----------------------|------|--------------------------------|------|-------------------|
| 8/26 | Introduction         | 8/28 | Study Strategies and Chapter 1 | 8/30 | Chapter 1 Quiz #1 |
| 9/2  | Labor Day – no class | 9/4  | <b>Team Activity 1</b>         | 9/6  | Chapter 2         |

|   |                                      |                                 |
|---|--------------------------------------|---------------------------------|
| 9/9<br>Chapter 2<br>ALEKS 1                   | 9/11<br>Chapter 3                    | 9/13<br><b>Team Activity 2</b>  |
| 9/16<br>Chapter 3                             | 9/18<br>Chapter 4<br>Quiz #2         | 9/20<br>Chapter 4               |
| 9/23<br><b>Exam One</b><br>ALEKS 2            | 9/25<br>Chapter 5                    | 9/27<br><b>Team Activity 3</b>  |
| 9/30<br>Chapter 5                             | 10/2<br>Chapter 6<br>Quiz #3         | 10/4<br>Chapter 6<br>ALEKS 3    |
| 10/7<br>Chapter 6                             | 10/9<br>Chapter 7                    | 10/11<br><b>Team Activity 4</b> |
| 10/14<br>FALL BREAK                           | 10/16<br>Chapter 7<br>Quiz #4        | 10/18<br>Chapter 8              |
| 10/21<br><b>Exam Two</b><br>ALEKS 4           | 10/23<br>Chapter 8                   | 10/25<br><b>Team Activity 5</b> |
| 10/28<br>Chapter 8                            | 10/30<br>Chapter 9<br>Quiz #5        | 11/1<br>Chapter 9               |
| 11/4<br>Chapter 9                             | 11/6<br>Chapter 9                    | 11/8<br>Chapter 10<br>ALEKS 5   |
| 11/11<br>Chapter 10                           | 11/13<br>Chapter 11<br>Quiz #6       | 11/15<br>Chapter 11             |
| 11/18<br>Chapter 11                           | 11/20<br>Chapter 12                  | 11/22<br>Chapter 12             |
| 11/25<br>Chapter 12<br><b>Team Activity 6</b> | 11/27<br><b>Thanksgiving</b>         | 11/29<br><b>Break</b>           |
| 12/2<br><b>Team Activity 6</b>                | 12/4<br><b>Exam Three</b><br>ALEKS 6 | 12/6<br><b>Course Review</b>    |

**Final Exam: Section 2:** Friday, December 13, 2019, 12:00 – 2:30 pm  
**Section 3:** Monday, December 9, 2019, 12:00 – 2:30 pm

Last day to drop a course: September 13

Last day to withdraw from a course or change to pass/fail grading: October 2