

**Wayland Baptist University
Plainview Campus
School of Mathematics and Sciences**

WAYLAND MISSION STATEMENT:

Wayland Baptist University exists to educate students in an academically challenging, learning-focused and distinctively Christian environment for professional success and service to God and humankind.

COURSE NUMBER AND TITLE:

CHEM 1400-VC01; Chemistry and Life

TERM:

Online Fall 1 2020

NAME OF INSTRUCTOR:

Robert Moore, Ph.D., Professor of Chemistry

OFFICE PHONE NUMBER AND WBU EMAIL ADDRESS:

Phone: 291-1125 (1125 on campus)

Email address: rmoore@wbu.edu

Note that my email address is formatted uniquely. I usually respond to emails very promptly unless I am otherwise engaged. If you do not get a response or acknowledgement of your email within a day, please double check to ensure that you sent the email to the correct address.

Office Hours, Building, and Location:

Plainview Campus – Moody Science Building 029

Monday 9:00 AM – 10:00 AM, 1:00 PM – 3:00 PM

Tuesday 9:30 AM – 11:00 AM

Wednesday 9:00 AM – 10:00 AM, 1:00 PM – 3:00 PM

Thursday 9:30 AM – 11:00 AM

Friday 9:00 AM – 10:00 AM

Students are encouraged to call or stop by the office any time the instructor is available including non-posted office hours.

COURSE DESCRIPTION:

Designed for allied health students and non-science majors or minors. Emphasizes fundamentals of chemistry: chemical terminology, metric system, energy relationships, atomic structure, chemical periodicity, bonding, gases, and chemical reactions; introductory organic and biochemistry. Laboratory provides exposure to basic laboratory experimental techniques. Lecture three hours, laboratory three hours.

PREREQUISITES:

High school algebra

REQUIRED RESOURCES:

Karen C. Timberlake, Chemistry: An Introduction to General, Organic, and Biological Chemistry, 13th ed. (2018) Pearson-Benjamin Cummings, San Francisco, CA. Earlier editions are also acceptable, but will not have the most up-to-date periodic table. Our weekly content follows the organization of the 12th and 13th editions.

Sapling Learning access code purchased from bookstore (if available) or online.

Labster access purchased through the bookstore.

COURSE OUTCOME COMPETENCIES:

At the conclusion of the course, the student should be able to:

1. Name and describe the role of important individuals and events in the history of chemistry.
2. Define, describe and identify the various terms, symbols and formulae studied.
3. Use the metric system to perform scientific measurements and carry out elementary calculations with these measurements (e.g., unit conversions; calculations of mass, volume, area; significant figure estimations, etc.).
4. Name and give the appropriate chemical symbols for the elements and simpler compounds studied.
5. Describe the basic elements of atomic structure and the relationships between atomic structure and chemical periodicity for the representative elements.
6. Recognize and define the types of chemical bonding in the compounds studied.
7. Identify, write and balance chemical equations for the types of reactions studied, and perform elementary stoichiometric calculations using these balanced chemical equations.
8. Recognize and understand the relationships between energy and the states of matter; perform basic calculations related to changes of state.
9. Identify and describe physical and chemical changes.
10. Define the properties of ideal gases and use the various equations studied to perform calculations involving changes in gas pressure, volume and temperature.
11. Define and describe the properties of solutions; perform concentration calculations.
12. Identify and describe the characteristics and simple chemical reactions of the common functional groups of organic chemistry: hydrocarbons, alcohols, aldehydes, ketones, carboxylic acids, esters, amines.
13. Identify and describe the characteristics and simple chemical reactions of the molecules commonly associated with biochemistry: carbohydrates, lipids, proteins.
14. Conduct basic chemistry laboratory procedures following laboratory safety guidelines, material safety data sheets and local, state and federal regulations related to the use and disposal of chemicals, reagents and hazardous chemical waste.
15. Collect, record, interpret and properly report experimental data.
16. Recognize and utilize fundamental principles of chemistry applicable to everyday life.

TIME COMMITMENT:

This course is an adaptation of the face-to-face class and covers the same material. That class meets for 5 hours a week over 16 weeks. This class is an 8-week class, so you should expect to spend about 10 hours a week watching lecture videos and performing lab exercises. This does not include time required for studying for exams.

STATEMENT ON PLAGIARISM AND ACADEMIC DISHONESTY:

Wayland Baptist University observes a zero tolerance policy regarding academic dishonesty. Per university policy as described in the academic catalog, all cases of academic dishonesty will be reported and second offenses will result in suspension from the university.

See <http://plagiarism.umf.maine.edu/index.html> for a description of plagiarism.

DISABILITY STATEMENT:

In compliance with the Americans with Disabilities Act of 1990 (ADA), it is the policy of Wayland Baptist University that no otherwise qualified person with a disability be excluded from participation in, be denied the benefits of, or be subject to discrimination under any educational program or activity in the university. The Coordinator of Counseling Services serves as the coordinator of students with a disability and should be contacted concerning accommodation requests at (806) 291-3765. Documentation of a disability must accompany any request for accommodations.

It is the responsibility of the student to inform the instructor of any disability that may require accommodation during the lecture or laboratory portions of the course. It is of particular importance to report any condition or disability that may affect the laboratory safety of the individual or others. Information provided for this purpose will be kept strictly confidential and will not in any way affect the individual's course grade.

COURSE REQUIREMENTS AND GRADING CRITERIA:

Students shall have protection through orderly procedures against prejudices or capricious academic evaluation. A student who believes that he or she has not been held to realistic academic standards, just evaluation procedures, or appropriate grading, may appeal the final grade given in the course by using the student grade appeal process described in the Academic Catalog. Appeals may not be made for advanced placement examinations or course bypass examinations. Appeals are limited to the final course grade, which may be upheld, raised, or lowered at any stage of the appeal process. Any recommendation to lower a course grade must be submitted through the Executive Vice President/Provost to the Faculty Assembly Grade Appeals Committee for review and approval. The Faculty Assembly Grade Appeals Committee may instruct that the course grade be upheld, raised, or lowered to a more proper evaluation.

There will be a folder in BlackBoard for each week of the class. Inside the folder will be a video introducing you to the content and a checklist for the week's activities. Following those items, you will find the lecture videos and links to all of the assignments for the week. The entire course content (except exams) will be available from day 1, but all homework and laboratory assignments must be completed by the end of the week (end of the day Saturday) in which they are assigned.

Please work on the content regularly throughout the week. Online homework should not be attempted in one setting. As this is an online course, reliable Internet access is a must. Some of the portions of this class cannot be performed on a phone and some tablets. Please ensure that you can access a computer. Technological difficulties are not an excuse for late work. As online students, it is imperative to stay ahead of due dates. Those dates are the date by which you must have all technological problems sorted out and have the assignment submitted, not the date by which your first attempt at submitting should occur. Working ahead is permitted and encouraged. Late work is penalized 10% of maximum score per day.

There are four main components to this course:

- 1) *Recorded lecture videos* – Watch these and take notes. These videos cover all the content in the class that you will be tested over. An entire list of all of the videos along with their length will be provided so that you can plan your time well.
- 2) *Weekly Online homework* – The online homework is through **Sapling Learning**. The only way to succeed in a chemistry class is to get practice working problems. I provide as many opportunities for you to pause and attempt problems during the videos as I can, but nothing can replace self-practice.
- 3) *Weekly Virtual Labs* – A major part of any science class is the laboratory component. Given the danger inherent in chemistry labs, trying to recreate one in your home is not advisable. Instead, we will be using a virtual lab environment called **Labster**. Each week you will be required to work through a lab module related to the content of the lecture that week.
- 4) *Exams* – Every 2 weeks, an online exam will be administered. These will not be proctored and are open book. Given that many of the questions require solving word problems, the exam being open book will be of no use if you have not gotten practice solving problems using your textbook and online homework.

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| Hour Exams (HE) (3 @ 10% each) | 30 % |
| Homework (HW) | 25 % |
| Laboratory (LB) | 25 % |
| Comprehensive Final Exam (FE) | 20 % |
| Final Grade = $0.30 \times \text{HE}(\text{avg}) + 0.25 \times \text{HW}(\text{avg}) + 0.25 \times \text{LB} + 0.20 \times \text{FE}$ | |

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|---|-------------|---|
| A | 90-100% | *An incomplete may be given within the last two weeks of the semester to a student who is passing but has not completed required work for reasons beyond the student's control. The incomplete will be removed only if the required work is completed by the date during the next academic term given in the academic catalogue. Failure to complete the work by this date will result in the grade of F. |
| B | 80-89% | |
| C | 70-79% | |
| D | 60-69% | |
| F | 0-60% | |
| W | Withdrawal | |
| I | Incomplete* | |

SAPLING LEARNING HOMEWORK:

1. View video on Blackboard introducing Sapling Learning found in the *Homework* section.
2. Go to www.saplinglearning.com/login for instructions on registering for the online homework.

Once you have registered and enrolled, you can log in at any time to complete or review your homework assignments. During sign up - and throughout the term - if you have any technical problems or grading issues, send an email to support@saplinglearning.com explaining the issue. The Sapling support team is almost always more able (and faster) to resolve issues than your instructor.

LABSTER:

Labster Simulations will be accessible through BlackBoard. Access to Labster requires purchase through the bookstore. Labster simulations include built-in questions that will become your lab grade. They will also require you to carry out actions in a virtual environment that are similar to what you would do in an actual lab, including wearing safety equipment, weighing out chemical reagents, collecting data using various instrumentation, carrying out calculations on the data, reaching conclusions regarding a real-world problem based on data you have collected and processed. While it plays very much like a constrained video game, it is highly recommended that you take notes while you work through the simulation so that you will be prepared to answer questions and so that you will have good records of the data to use for performing calculations. Your laboratory grade is directly connected to your Labster performance. Simulations require between 30 and 90 minutes to run, depending on your proficiency with the material. You are permitted to replay a simulation if you are dissatisfied with your performance, but be aware that the questions and data may change between attempts and you will not be able to reuse your responses from the previous attempt. The most efficient approach is to strive to do your best on your first attempt.

SCHEDULE:

| WEEK | 12 th & 13 th Ed. CHAPTER | TOPICS | LABORATORY Due 11:59 each Saturday | SAPLING HOMEWORK Due 11:59 each Saturday |
|--|---|---|--|--|
| 1 Aug 17-22 | 1-2 | Chemistry and Measurements | Chemistry Safety | HW1 HW2 |
| 2 Aug 23-29 | 3 | Matter and Energy | Matter and Phase Changes | HW3 |
| EXAM #1 – due Wed Sep 2 | | | | |
| 3 Aug 30 – Sep 5 | 4 | Atoms and Elements | Periodic Table | HW4 |
| 4 Sep 6-12 | 6 | Ionic and Molecular Compounds | Ionic and Covalent Bonds | HW6 |
| EXAM #2 – due Wed Sep 16 | | | | |
| 5 Sep 13-19 | 7 | Chemical Quantities and Reactions | Stoichiometry and Chemical Equilibrium | HW7 |
| 6 Sep 20-26 | 8 | Gases | Ideal Gas Law | HW8 |
| EXAM #3 – due Wed Sep 30 | | | | |
| 7 Sep 27 – Oct 3 | 9 | Solutions | Solution Preparation | HW9 |
| 8 Oct 4-10 | 10 | Acids and Bases and Equilibrium | Titration | HW10 |
| OPTIONAL | 11 - 14 | Introduction to Organic Chemistry | | |
| OPTIONAL | 15 - 18 | Introduction to Biochemistry | | |
| COMPREHENSIVE FINAL EXAM – due Sat Oct 10 | | | | |

Revised 7/7/20 RM