

COURSE:	General Chemistry 1, CHEM140 D&DN, CHEM 141D, and CHEM 141N
CREDIT:	4 Semester Hours (class). 1 Semester Hour (lab).
SEMESTER:	Fall 2020, Cycle 2 (CHEM 140D&DN and CHEM 141N) Fall 2020, Cycle 3 (CHEM 141D)
TIME:	Lecture CHEM 140D Tuesday 8:00AM – 11:00AM CHEM 140DN - Online <i>Online</i> Lab CHEM 141N (option 1) – Online <i>On Campus</i> Lab CHEM 141D (option 2) Tuesday 8:30 – 11:30 AM
LOCATION:	CHEM 140D: Ed. 118-9 CHEM 140DN: Online CHEM 141D: Ed. 101 and 118-9 CHEM 141N: Online
INSTRUCTOR:	Chris Basel
CONTACT INFO:	Office Phone: 816-425-6201 E-mail: chris.basel@calvary.edu
OFFICE:	Ed. 224

It's an exciting time to study chemistry! New chemistry discoveries are made every day and our understanding of nature has increased incredibly. Chemistry has applications in numerous areas of science, medicine, engineer, and other fields. Some suggest that the Bible and chemistry are inconsistent. However, on the contrary, chemistry and the Bible are completely consistent and this should strengthen our faith as we discover more and more about the incredible, awesome nature of our Creator God!

I. COURSE DESCRIPTION:

CHEM 140D&DN (4 hours) An introduction to chemistry for science majors. Qualitative and quantitative reactions and interactions of atoms and molecules will be covered. Specific topics include chemical reactions, gases, thermochemistry, quantum mechanics, periodicity, and bonding. (Prerequisites: MA 115 or equivalent with a C or higher. One year of high school chemistry or CHEM 105 and 106 or equivalent with a C or higher.)

CHEM 141D (1 hour) This course is one of two optional lab formats of CHEM 140. If taken, it must be within one year of CHEM 140D&DN. (Fee: \$35)

CHEM 141N (1 hour) This course is one of two optional lab formats of CHEM 140. This lab is completed remotely and required purchase of a lab kit. If taken, it must be within one year of CHEM 140D&DN. (Fee: Approximately \$225)

CHEM 140D&DN are blended classes, meaning that both campus and online students take this class together. Campus students attend the classes in person, online students attend the classes via the online classroom. All interaction and assignments for campus and online students are done in the online classroom.

CHEM141D and CHEM141N are blended labs, meaning that both campus and online students complete similar lab experiments. Campus students complete the classes in person, online students complete the labs at the location of their choice. It is required that students choose one of the two options.

II. COURSE OBJECTIVES:

A. General competencies to be achieved. The student will:

- 1) Demonstrate an understanding of the fundamental concepts of general chemistry from a biblical worldview.
 - a. Program Objectives 1 through 5.
 - b. Assessments – chapter review questions and exams.

B. Specific competencies to be achieved. The student will:

- 1) Demonstrate an understanding of the principles of general chemistry and use the principles to understand the applications of general chemistry.
 - a. Program Objectives 1, 3, 4, and 5.
 - b. Assessments – chapter review questions and exams.
- 2) Read literature covering the biblical worldview of general chemistry and demonstrate your understanding of these concepts by reporting on the literature clearly and concisely.
 - a. Program Objectives 2, 3, and 4.
 - b. Assessments – Biblical worldview essays.

III. REQUIREMENTS: All students will be expected to:

- Participate frequently and make regular progress.
- Complete reading assignments, homework, biblical worldview essays, and exams on schedule.
- CHEM 141 - lab students only: Work safely and complete all labs and lab reports on schedule.

IV. METHODS

A. LECTURES: Lectures will consist of material from the book and additional material from a variety of sources. Students should take notes as the homework questions will be directly related to the lectures.

B. READING AND CHAPTER REVIEW (HOMEWORK) QUESTIONS: The textbook provides a framework for the class. The text is **not required** as the information can be obtained from lectures or other online sources. However, most students will find the textbook very useful for studying (consider an eText). Not every topic in the textbook will be addressed. Emphasis will be placed on the most important concepts and practical applications. The instructor will tell you which sections of each chapter will be covered. It is imperative that you complete the homework problems to understand the material and to do well on tests.

C. HOMEWORK QUESTIONS: Homework questions will normally be completed using the Mastering Chemistry software in Canvas. It is imperative that you complete the homework problems to understand the material and to do well on tests. Test questions will be similar to the questions on the homework.

D. BIBLICAL WORLDVIEW ESSAYS: The purpose of this portion of the class is to develop your ability to analyze the complex issues associated with chemistry from the biblical worldview and to learn that you can defend your faith (1 Peter 3:15) using science. You will read articles or watch videos and then prepare essays that demonstrate your understanding of the topics.

Essays must follow the APA style according to the Publication Manual of the American Psychological Association, 6th edition except as noted in this paragraph. Essays should be around one-half page, single spaced, using Times New Roman 12 font. Essays should not be longer than one page. Do not include a title page or a reference page. Put a descriptive title and your name and date at the top of the page. Include the reference after the bottom of the essay. You will be graded on content and understanding of the topics. Your writing should be clear and concise. Proper writing style including clarity, grammar, and punctuation will be considered during grading. Do not use first person. Discuss what the article or video said and means, not what you think about it. Make sure you use quotation marks as needed.

Plagiarism is defined as copying any part of a book or paper without identifying the author. This also includes taking another person's ideas and presenting them as your own.

- E. **TESTS:** Questions used for the regular exams will be similar to the homework. Test questions for the comprehensive portion of the final will be taken from the regular tests and will include new material covered since the last regular exam. Exams will be taken in the Mastering Chemistry software via Canvas.

Students not taking tests during the class period on campus will need to use the ProctorU test proctoring service. See the ProctorU addendum at the end of this syllabus.

- F. **MISSED OR LATE HOMEWORK OR BIBLICAL WORLDVIEW ESSAYS:**

Grades for late homework and essays will be reduced for each day that they are late. Assignments that are more than one week late will not be accepted and will receive no credit.

- G. **LAB PREPARATION AND REPORTS**

Students taking CHEM 140D: Lab instructions must be read before completing each lab. Lab reports should be completed and turned in as instructed by the beginning of the next lab. Grades on late lab reports will be decreased for each day they are late. Lab reports that are turned in more than one week late will not be accepted and will receive no credit.

Students taking CHEM 141N: Prepare lab reports as instructed in the Hands-On Labs software. Grades on late lab reports will be decreased for each day they are late. Lab reports that are turned in more than one week late will not be accepted and will receive no credit.

- H. **LAB SAFETY**

Students taking CHEM 140D: Safety during lab activities must be observed at all times for your own safety, as well as the safety of others around you. Students performing lab experiments are responsible for planning and conducting experiments in accordance with the lab instructions and lab safety rules. Additional safety rules (when required) will be included in lab handouts. Safety will be discussed at the start of each lab, so if you are late, you may not be allowed to attend. Each student who participates in a lab exercise must clean up their lab area when finished before leaving. **All students must take a lab safety quiz covering the safety rules and sign a safety contract before working in the lab.**

Students taking CHEM 141N: Safety during lab activities must be observed at all times. Students performing lab experiments are responsible for planning and conducting experiments in accordance with the lab instructions and lab safety rules. Additional safety rules (when required) may be included with each lab. Each student who participates in a lab exercise must clean up their lab area when finished before leaving. **All students must take a lab safety quiz covering the safety rules and sign a safety contract before working completing any labs.**

I. LAB ATTENDANCE:

CHEM 141D Lab attendance is required except for absences officially excused by the university, or for extenuating circumstances such as illness or death in the family. Labs missed for any reason must be made up at a later date, typically the next week. Missing more than two labs, even when excused by the university, may result in a lower grade. See the lab attendance policy on Canvas for details.

CHEM 141N Lab is conducted remotely and attendance at a specific time is not required.

J. HOW TO GET HELP:

I am available during my posted office hours in room Ed. 224. Also, feel free to contact me via email or phone (see email address and phone numbers above).

The Clark Academic Center (learning@calvary.edu) is dedicated to providing free academic assistance for all CU students. Student tutors aid with all facets of the writing process, tutor in various subject areas, prepare students for exams and facilitate tests. Please take advantage of this service.

Students with disabilities have the responsibility of informing the DSS Director (dss@calvary.edu) of any disabling condition that may require support.

V. GRADING - See grading scale in the university catalog.

CHEM 140

Chapter Review Questions	20%
Regular Exams	50%
Biblical Worldview Essays	15%
Final Examination (comprehensive)	15%

CHEM 141

Lab Investigations and Reports	100%
--------------------------------	------

VI. MATERIALS – Required

- A) **The Bible:** The Bible is a required textbook in every course at Calvary University. To facilitate academic level study, students are required to use for assignments and research an English translation or version of the Bible based on formal equivalence (meaning that the translation is generally word-for-word from the original languages), including any of the following: New American Standard (NASB, English Standard Version (ESV), New King James (NKJV), or King James (KJV). Other translations and versions based on dynamic equivalence (paraphrases, and thought-for-thought translations like NLT and NIV) may be used as supplemental sources. Please ask the professor if you have questions about a particular translation or version.
- B) **Mastering Chemistry Software (CHEM 140):** It is **required** that you purchase access to the **Modified Mastering Chemistry** software. This is required to complete the homework and tests. The cost is approximately \$70. It will also allow access to many on-line helps that are useful for learning this material. **Purchase this through the class website on Canvas!** See comments below about purchasing it with the eText, which is an option. Detailed instructions will be given there. If you do not purchase the software through the Canvas class website, it will be the wrong software!
- C) **Lab Manual (only for students taking CHEM 141D):** On campus students must purchase the following lab manual. The cost is \$80. (Note – this manual is used for both CHEM 141D and CHEM 146D.)

Laboratory Manual for Chemistry: Structure and Properties, 2nd Edition
Author: Tro & Norton
ISBN10: 0134616456 ISBN13: 9780134616452
Pearson, 2018

- D) **Lab kit (only for students taking CHEM 141N):** It is required that you purchase the lab kit prepared for this class to complete the lab experiments for CHEM 141N. The cost is approximately \$225. **Purchase this through the class website on Canvas!** Detailed instructions will be given there. If you do not purchase the kit through the Canvas class website, it will be the wrong kit!

VII. MATERIALS - Optional

Textbook:

Chemistry: A Molecular Approach, 5th Edition
Author: Nivaldo J. Tro
ISBN-13: 9780134989761
Pearson, 2020

The text is **not required** as the information can be obtained from lectures or other online sources. *However, most students will find the textbook very useful for studying.* If you want a hard copy of your own, consider purchasing a used version on the internet (typically around \$50). New hard copies cost approximately \$230. Previous editions of the text may be acceptable and will be less expensive. Another option is the eText which is about \$45 with the Mastering software. Consider purchasing the package – Mastering Chemistry software and eText together as you will save money. Be aware, though, that the eText disappears at the end of the semester.

VIII. TENTATIVE CLASS SCHEDULE:

Any changes to the schedule will be posted on Canvas.

TOPIC(S)	CHAPTER(S)
Matter, Measurement and Problem Solving	1
Atoms and Elements	2
Molecules and Compounds	3
Chemical Reactions and Chemical Quantities	4
Introduction to Solutions and Aqueous Reactions	5
Gases	6
Thermochemistry	7
The Quantum-Mechanical Model of the Atom	8
Periodic Properties of the Elements	9
Chemical Bonding 1: The Lewis Model	10
Chemical Bonding 2: Molecular Shapes and VSEPRS	11

ProctorU Addendum

Calvary University uses ProctorU test proctoring service. ProctorU is a live online proctoring service that allows you to take your exam from the comfort of your home. ProctorU is available 24/7, however, **you will need to schedule your proctoring session at least 72 hours in advance to avoid any on-demand scheduling fees.** Creating a ProctorU account is simple. You can do so by going to <https://go.proctoru.com/students/users/new?institution=2045>.

Students must read all information and comply with all directions below to be successful for their proctored exam experience. Calvary University hopes that students will have a smooth experience, and to decrease student anxiety and increase success, please use this guide to help you plan for your test. Please note that, per ProctorU, there will be penalties for students who miss their testing window. Technical trouble will not be an excuse for missing the window. Therefore, pay attention to all details within this guide, and all links included.

System Requirements: Please see the information below supplied by ProctorU for system requirements. If your computer does not have these capabilities, please consider borrowing a computer as you will still be required to complete the exam using the live proctor system with ProctorU. Please note that you will not be able to take your exam(s) in the Calvary University Library due to the activity that will be picked up in a public place.

In order to use ProctorU, you will need a high-speed internet connection, a webcam (internal or external), a Windows or Apple Operating System, and a government issued photo ID. ProctorU recommends that you visit <https://test-it-out.proctoru.com/> prior to your proctoring session to test your equipment. They recommend you click on the button that says "connect to a live person" to fully test out your equipment. If using Firefox, please make sure that you are using the current version of your Firefox browser and have downloaded the ProctorU extension available at <https://www.proctoru.com/firefox>.

Type	Minimum	Recommended	Calvary University Minimum
Web Camera	640×480 resolution	1280×720 resolution	1280×720 resolution
PC Users	Windows Vista	Windows 10 (10 S is not supported)	same
Mac Users	OS X 10.5 or higher	OS X 10.13 High	same

		Sierra	
Internet Download Speed	.768 Mbps	1.5 Mbps	3 Mbps
Internet Upload Speed	.384 Mbps	1 Mbps	2 Mbps
RAM	1024 MB	2 GB	same
Ports	1935, 843, 80, 443, 61613, UDP/TCP	1935, 843, 80, 443, 61613, UDP/TCP	same

- Desktop computer or laptop (not a tablet, Chromebook or cell phone).
- Webcam and microphone (built-in or external) – test your webcam at <https://test.webrtc.org/>
- Connection to network with sufficient internet speed: at least 3 Mbps download speed and 2 Mbps upload – test internet speed at www.speedtest.net
- Operating systems: Windows Vista or newer, Mac OS X 10.5 – or newer
- Browser with pop-up blocker disabled: Google Chrome v39 or later, Mozilla Firefox v34 or later.

Additionally, please visit and review the test-taker resource center by going to <https://www.proctoru.com/proctoru-live-resource-center>. You should expect the startup process with the proctor to take about 10-15 minutes. However, this time will not affect your exam time. Please feel free to direct any questions to the student support team via the live chat within your account.

******If you have any questions or concerns, contact Proctor U's technical support team 24/7 via their live chat support at <https://www.proctoru.com/contact-us>**

Costs for ProctorU exams are listed below and are payable to ProctorU at the time of the test. These costs assume that a student will schedule their exam at least 72 hours in advance of the exam start time:

- 60 minutes or less - \$8
- 61 – 120 minutes - \$10
- 121 – 180 minutes - \$12

For those not scheduling an exam at least 72 hours in advance, late scheduling charges are added in addition to the above fee structure. There are two options for late scheduling:

- "Take It Soon" allows a test to be scheduled less than 72 hours but more than 24 hours before the desired start time. This option includes an additional fee of \$8.00. (Total cost for a 60 minute exam scheduled as "Take It Soon" would be \$16.)
- "Take It Now" allows a test to be taken on-demand with no appointment needed. This option includes an additional fee of \$12.00. (Total cost for a 60 minute exam scheduled as "Take It Now" would be \$20.)

These options are for the convenience of the examinee. Any charges applicable to the examinee must be paid with a credit or debit card. The test taker will be required to enter payment information on a secure page connected to a third-party card processor. The page is encrypted and secure and ProctorU does not see or store any credit card data.

Examinees will be required to re-enter payment information each time new charges are incurred.