

COURSE:	Chemistry with Health Applications, CHEM105 T&N-T and CHEM106 T&N-T
CREDIT:	3 Semester Hours (class). 2 Semester Hours (lab).
SEMESTER:	Spring 2023, Cycles 4 and 5
INSTRUCTOR:	Chris Basel
CONTACT INFO:	Office Phone: 816-425-6201 E-mail: chris.basel@calvary.edu
OFFICE:	East Ed. 224
MEETING TIME:	CHEM105 T and CHEM106 T, Tuesdays 8:00 – 11:00 AM CHEM105 N-T and CHEM106 N-T: Online
LOCATION:	CHEM105 T and CHEM106 T: Ed.118-9 CHEM105 N-T and CHEM106 N-T: Online

It's an exciting time to study science! Scientific discoveries are made every day and our understanding of nature has increased incredibly. Some suggest that the Bible and science are inconsistent. However, on the contrary, science 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:

CHEM105 T&N-T (3 hrs) A broad overview of fundamental chemical concepts for those interested in a career in health sciences (nursing, respiratory therapist, etc.) or those who otherwise have an interest in health/medical applications of chemistry. Emphasis is placed on a conceptual understanding of general, organic, and biological chemistry from a biblical worldview.

This course is offered in two formats: in-person and online. Students registered for in-person attend the classes in person, online students attend the classes via the online classroom. For both in-person and online students, assignments and interaction outside of the class period are done in the learning management system.

CHEM106 T (2 hrs) This course is one option for the lab component of CHEM105. If CHEM106 is taken, it must be concurrent with CHEM105. (Fee: \$30)

CHEM106 N-T (Online only) (2 hrs) This course is a second option for the lab component of CHEM105. If CHEM106 is taken, it must be concurrent with CHEM105. CHEM106 is completed remotely and requires purchase of a lab kit. (Fee: \$250)

II. COURSE OBJECTIVES:

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

- 1) Demonstrate an understanding of the fundamental concepts of general, organic, and biological chemistry from a biblical worldview.
 - a. Program Objectives 1 and 3.
 - b. Assessments – chapter review questions and exams.

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

- 1) Demonstrate the ability to apply the concepts of general, organic, and biological chemistry to health applications.
 - a. Program Objectives 1, 3, and 4.

- b. Assessments – chapter review questions and exams.
- 2) Read literature covering the biblical worldview of general, organic and biological 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.
- CHEM106 - 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 during lectures as the homework questions will be directly related to the lectures and not all the information can be obtained from the book.
- B. **READING:** The textbook provides a framework for the class. 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.
- 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. Most of the test questions will be taken directly from the homework, possibly with minor modification.
- D. **BIBLICAL WORLDVIEW ESSAYS:** The purpose of this portion of the class is to develop your ability to analyze the complex issues associated with biology 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. *For details about how to write the essays, see the Essay Guidelines in Canvas.*

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 taken from the homework, possibly with minor modifications. Test questions for the comprehensive portion of the final will be taken from the regular tests and new material covered since the last regular exam. Lecture section exams will be taken using the Mastering Chemistry software via Canvas. Lab exams (CHEM106 T only) will be taken from the lab handouts.

All online students and on-campus students not taking tests during the class period must use the ProctorU test proctoring service. *The Exam Policy in Canvas gives more details. Also see the ProctorU addendum at the end of this syllabus.*

F. MISSED OR LATE HOMEWORK OR BIBLICAL WORLDVIEW ESSAYS:

Grades for late homework and biblical worldview essays will be reduced for each day that they are late. Assignments that are more than three days late will not be accepted and will receive no credit.

G. LAB PREPARATION AND REPORTS

Students taking CHEM106 T: Lab instructions must be read before coming to the lab. Lab reports should be completed and turned in via Canvas by the due date given in Canvas. Grades on late lab reports will be decreased for each day they are late. Lab reports that are turned in more than three days late will not be accepted and will receive no credit.

Students taking CHEM106 N-T: Prepare lab reports as instructed by the software. Grades on late lab reports will be decreased for each day they are late. Lab reports that are turned in more than three days late will not be accepted and will receive no credit.

H. LAB SAFETY

Students taking CHEM106 T: 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 CHEM106 N-T: 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. All students must take a lab safety quiz covering the safety rules and sign a safety contract before completing any labs.

I. LAB ATTENDANCE:

CHEM106 T: 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 in Canvas for details*

CHEM106 N-T: 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 E. Ed. 224. Virtual office hours are available in the evening. Also, feel free to contact me via email or phone (see email address and phone number 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 Accommodations Support Coordinator (aso@calvary.edu) of any disabling condition that may require support.

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

CHEM105

Chapter Review Questions	15%
Exams	65%
Biblical Worldview Essays	20%

CHEM106 T

Lab Investigations and Reports	90%
Midterm	5%
Final	5%

CHEM106 N-T

Lab Investigations and Reports	100%
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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 with eText:** It is **required** that you purchase access to the **Modified Mastering Chemistry** software. The Mastering Chemistry software is required to complete the homework and tests. **The text for the class is included in electronic format.** The cost (software and eText combined) is approximately \$100. 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!** Detailed instructions will be given there. If you do not purchase the software through the Canvas class website, it will be the wrong software! Access to Mastering Chemistry and the eText expires when the course is over.
- C) **Lab kit (only for students taking CHEM106 N-T):** It is required that you purchase the lab kit prepared for this class to complete the lab experiments for CHEM106 N-T. The cost is around \$250. **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 (*hard copy*):

Chemistry, An Introduction to General, Organic, and Biological Chemistry (13th Edition)

Author: Karen Timberlake

ISBN-13: 978-0134421353 ISBN-10: 0134421353

Pearson, 2016

A hard copy of text is **not required** as an eText is included with the Mastering Chemistry software. If you want a hard copy, consider purchasing a used version on the internet (typically around \$50). New hard copies cost approximately \$200. Previous editions of the text should be acceptable and will be less expensive.

VIII. TENTATIVE CLASS SCHEDULE:

Any changes to the schedule will be posted on Canvas.

TOPIC(S)	CHAPTER(S)
Introduction to chemistry and measurements	1 and 2
Matter and energy	3
Atoms and elements	4
Nuclear chemistry	5
Ionic and molecular compounds	6
Chemical quantities and reactions	7
Gases	8
Solutions	9
Acids and bases and equilibrium	10
Organic chemistry compounds 1 – hydrocarbons, alcohols, thiols, ethers, aldehydes and ketones	11 and 12
Organic chemistry compounds 2 – carbohydrates, carboxylic acids, esters, amines and amides	13 and 14
Biochemistry 1 – lipids, amino acids, proteins, and enzymes	15 and 16
Biochemistry 2 – nucleic acids and protein synthesis	17
Biochemistry 3 – metabolic pathways and ATP production	18

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 Sierra	same

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.