

# COURSE SYLLABUS



COURSE TITLE: CHEM-255-Biochemistry

CLASS SECTION: 001

TERM: 2024F

COURSE CREDITS: 3

DELIVERY METHOD(S): Lecture, Laboratory

Camosun College respectfully acknowledges that our campuses are situated on the territories of the Ləkʷəŋən (Songhees and Kosapsum) and WSÁNEĆ peoples. We honour their knowledge and welcome to all students who seek education here.

## INSTRUCTOR DETAILS

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NAME: David Stuss

EMAIL: [stussd@camosun.ca](mailto:stussd@camosun.ca)

OFFICE: Fisher 350A

HOURS: Monday to Friday 1:30 – 2:20 PM *or by appointment*

*As your course instructor, I endeavour to provide an inclusive learning environment. However, if you experience barriers to learning in this course, do not hesitate to discuss them with me. Camosun College is committed to identifying and removing institutional and social barriers that prevent access and impede success.*

## CALENDAR DESCRIPTION

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This course concerns fundamental aspects of biomolecules and biochemical processes and their relevance to biotechnology and health. Topics include: noncovalent interactions, buffers, structure-function relationships in biomolecules, enzymology, lipids and membranes, bioenergetics; carbohydrate, lipid, amino acid and nucleotide metabolism, DNA synthesis, gene expression, protein synthesis and prevalent biochemistry laboratory techniques.

### PREREQUISITE(S):

All of:

- CHEM 121

### CO-REQUISITE(S):

All of:

- C in CHEM 230

### EQUIVALENCIES:

## COURSE LEARNING OUTCOMES / OBJECTIVES

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Upon completion of this course a student will be able to:

1. Describe the fundamental characteristics of proteins, including enzymes, carbohydrates, lipids, and the nucleic acids, DNA and RNA.
2. Describe the chemical and biochemical principles governing the structure-function relationships of biomolecules and membranes.
3. Describe the underlying themes of key biochemical processes, including metabolism, bioenergetics, gene expression and protein synthesis.
4. Describe and evaluate the important aspects of the biochemical framework of cellular function at a molecular level, and the chemical bases thereof.
5. Use the basic vocabulary of biochemistry.
6. Explain the significance of biochemistry in clinical and veterinary medicine, laboratory analyses, nutrition, agriculture, and biotechnology.
7. Isolate specific proteins using gel-permeation, ion-exchange, and affinity-based column chromatography methods.
8. Analyze proteins by SDS-polyacrylamide electrophoresis.
9. Conduct polymerase chain reaction amplification of DNA molecules.
10. Utilize agarose gel electrophoresis for analysis of DNA samples.
11. Critically analyze the results obtained using each of the biochemical experimental techniques described above.
12. Work with an awareness of the basic safety considerations and general procedures associated with a biochemistry laboratory.

## REQUIRED MATERIALS & RECOMMENDED PREPARATION / INFORMATION

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(a) Voet. (2024). *Fundamentals of Biochemistry*, 6<sup>th</sup> Ed. Wiley. (required)

Available in print & e-text formats.

(b) CHEM 255 Lab Manual (required)

(c) Lab Coat (required). Students must provide their own lab coat for laboratory work.

(d) UVEX Safety glasses (required)

(e) Scientific Calculator (required)

All required materials can be purchased through the bookstore.

Lecture slides & homework will be provided on D2L. Lecture slides can be printed, downloaded or accessed online.

COURSE SCHEDULE, TOPICS, AND ASSOCIATED PREPARATION / ACTIVITY / EVALUATION

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ACTIVITY	TIME	LOCATION
Lecture	Monday, Tuesday 2:30 - 3:20 PM	E344
	Wednesday, Friday 2:30 - 3:20 PM	Y209
Lab	Monday 8:30 – 10:20 AM	F360

The following schedule and course components are subject to change with reasonable advance notice, as deemed appropriate by the instructor. Students unable to attend a given lab period may be able to join the other section's lab period and should consult the instructor in advance to confirm.

WEEK	CHAPTERS	LAB ACTIVITY – Section 001	LAB ACTIVITY – Section 002
1	1,2	<i>Labour Day – College closed</i>	<i>Orientation</i>
2	3,4	<i>Orientation / Exp. 1 – Gel Filtration Chromatography</i>	Exp. 1 – Gel Filtration Chromatography
3	5,7	Exp. 2 – Ion Exchange Chromatography	Exp. 2 – Ion Exchange Chromatography
4	9,10	Exp. 3 – Affinity Chromatography Part 1	Exp. 3 – Affinity Chromatography Part 1
5	10,12	<i>TRC Day – College closed</i>	<i>Review</i>
6	13,14	<b>Midterm 1</b>	<b>Midterm 1</b>
7	14,15	<i>Thanksgiving – College closed</i>	<i>Tutorial</i>
8	15,16	Exp. 3 – Part 2 Exp. 4 – SDS-PAGE Part 1	Exp. 3 – Part 2 Exp. 4 – SDS-PAGE Part 1
9	16,18	Exp. 4 – SDS-PAGE Part 2	Exp. 4 – SDS-PAGE Part 2
10	19,6	Exp. 4 – SDS-PAGE Part 3	Exp. 4 – SDS-PAGE Part 3
11	6,21	<i>Remembrance Day – College closed</i>	<i>Review</i>
12	21,22	<b>Midterm 2</b>	<b>Midterm 2</b>
13	22,24	Exp. 5 – PCR Part 1	Exp. 5 – PCR Part 1
14	25	Exp. 5 – PCR Part 2	Exp. 5 – PCR Part 2

Students registered with the Centre for Accessible Learning (CAL) who complete quizzes, tests, and exams with academic accommodations have booking procedures and deadlines with CAL where advanced notice is required. Deadlines can be reviewed on the [CAL exams page](#).

<https://camosun.ca/services/academic-supports/accessible-learning/academic-accommodations-exams>

## EVALUATION OF LEARNING

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DESCRIPTION	WEIGHTING
Labs (8)	20%
Quizzes (4 x 2.5%)	10%
Midterm Tests (2 x 17.5%)	35%
Final Exam	35%
	<b>TOTAL</b>
	100%

## COURSE GUIDELINES & EXPECTATIONS

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1. You must pass both the lecture portion and the laboratory portion with a score of 50% in order to pass the course.
2. The laboratory mark is based on lab participation, performance, preparation of a pre-lab flowchart and pre-lab questions, and some analysis. Lab activities will generally be done in pairs but each student must prepare their own pre-lab materials for the lab. Lab participation is **mandatory** and laboratory topics and techniques are testable material.
3. Students are expected to wear protective equipment (safety glasses and lab coat) at all times during lab activities.
4. Quizzes will be given during lecture period and cover recent lecture and reading material. Quiz dates will be announced in class. There are no make-up quizzes.
5. Each midterm will cover ~1/3 of the course. There will be no make-up midterm tests. There is no penalty for missing a midterm; the weight of the test will be reassigned to the cumulative final exam.
6. If a higher percent grade is obtained on the cumulative final exam than the combined two midterms, the difference will be added to the combined midterm mark as an improvement bonus.
7. All tests and exams must be written at the scheduled times with the exception of students with CAL accommodations. Students who miss the final exam due to emergency circumstances (e.g. severe illness / family emergency) may be offered accommodation at the instructor's discretion, provided that:

- a) the student notifies the instructor prior to the exam (not after)
- b) documented evidence of the circumstance is provided (e.g. medical certificate)

End-of term travel plans should not be booked until the exam schedule has been posted. Booked travel plans will not be granted a final exam accommodation.

- 8. Students are expected to attend all lectures. When a lecture is missed, it is the student's responsibility to obtain information given in lecture from peers and to check D2L for assigned homework.
- 9. Study habits: To succeed in the course, students are expected to spend a weekly *minimum* of 6h/wk studying outside of class time. Material presented in lecture, including posted lecture slides, is intended as an overview / study guide and not as the single primary information source for testing. Students are expected to make notes from reading materials and to complete all assigned homework.

## SCHOOL OR DEPARTMENTAL INFORMATION

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The School of Arts and Science offers a Science Help Centre. Tutors are available in Fisher 264 to assist you in chemistry, biology and physics. The schedule will be posted on D2L. Learn more about the Science Help Centre here: <https://camosun.ca/services/academic-supports/help-centres/science-help-centre>

Students may only use recording devices in the classroom with the prior permission of the instructor or the Centre for Accessible Learning. The instructor's permission is not required when the use of a recording device is sanctioned by the College's Centre for Accessible Learning in order to accommodate a student's disability, *and* when the instructor has been provided with an instructor notification letter which specifies the use of a recording device.

## STUDENT RESPONSIBILITY

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Enrolment at Camosun assumes that the student will become a responsible member of the College community. As such, each student will display a positive work ethic, assist in the preservation of College property, and assume responsibility for their education by researching academic requirements and policies; demonstrating courtesy and respect toward others; and respecting expectations concerning attendance, assignments, deadlines, and appointments.

## SUPPORTS AND SERVICES FOR STUDENTS

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Camosun College offers a number of services to help you succeed in and out of the classroom. For a detailed overview of the supports and services visit [camosun.ca/services](https://camosun.ca/services).

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Support Service

Website

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Academic Advising

[camosun.ca/services/academic-supports/academic-advising](https://camosun.ca/services/academic-supports/academic-advising)

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Support Service	Website
Accessible Learning	<a href="https://camosun.ca/services/academic-supports/accessible-learning">camosun.ca/services/academic-supports/accessible-learning</a>
Counselling	<a href="https://camosun.ca/services/health-and-wellness/counselling-centre">camosun.ca/services/health-and-wellness/counselling-centre</a>
Career Services	<a href="https://camosun.ca/services/co-operative-education-and-career-services">camosun.ca/services/co-operative-education-and-career-services</a>
Financial Aid and Awards	<a href="https://camosun.ca/registration-records/financial-aid-awards">camosun.ca/registration-records/financial-aid-awards</a>
Help Centres (Math/English/Science)	<a href="https://camosun.ca/services/academic-supports/help-centres">camosun.ca/services/academic-supports/help-centres</a>
Indigenous Student Support	<a href="https://camosun.ca/programs-courses/iecc/indigenous-student-services">camosun.ca/programs-courses/iecc/indigenous-student-services</a>
International Student Support	<a href="https://camosun.ca/international">camosun.ca/international</a>
Learning Skills	<a href="https://camosun.ca/services/academic-supports/help-centres/writing-centre-learning-skills">camosun.ca/services/academic-supports/help-centres/writing-centre-learning-skills</a>
Library	<a href="https://camosun.ca/services/library">camosun.ca/services/library</a>
Office of Student Support	<a href="https://camosun.ca/services/office-student-support">camosun.ca/services/office-student-support</a>
Ombudsperson	<a href="https://camosun.ca/services/ombudsperson">camosun.ca/services/ombudsperson</a>
Registration	<a href="https://camosun.ca/registration-records/registration">camosun.ca/registration-records/registration</a>
Technology Support	<a href="https://camosun.ca/services/its">camosun.ca/services/its</a>
Writing Centre	<a href="https://camosun.ca/services/academic-supports/help-centres/writing-centre-learning-skills">camosun.ca/services/academic-supports/help-centres/writing-centre-learning-skills</a>

If you have a mental health concern, please contact Counselling to arrange an appointment as soon as possible. Counselling sessions are available at both campuses during business hours. If you need urgent support after-hours, please contact the Vancouver Island Crisis Line at 1-888-494-3888 or call 911.

## COLLEGE-WIDE POLICIES, PROCEDURES, REQUIREMENTS, AND STANDARDS

### Academic Integrity

Students are expected to comply with all College policy regarding academic integrity; which is about honest and ethical behaviour in your education journey. The following guide is designed to help you understand your responsibilities: <https://camosun.libguides.com/academicintegrity/welcome>  
Please visit <https://camosun.ca/sites/default/files/2021-05/e-1.13.pdf> for Camosun's Academic Integrity policy and details for addressing and resolving matters of academic misconduct.

### Academic Accommodations for Students with Disabilities

Camosun College is committed to achieving full accessibility for persons with disabilities. Part of this commitment includes arranging appropriate academic accommodations for students with disabilities to ensure they have an equitable opportunity to participate in all of their academic activities. If you are a student with a documented disability and think you may need accommodations, you are strongly encouraged to contact the Centre for Accessible Learning (CAL) and register as early as possible. Please visit the CAL website for more information about the process of registering with CAL, including important deadlines: <https://camosun.ca/cal>

### Academic Progress

Please visit <https://camosun.ca/sites/default/files/2023-02/e-1.1.pdf> for further details on how Camosun College monitors students' academic progress and what steps can be taken if a student is at risk of not meeting the College's academic progress standards.

### Course Withdrawals Policy

Please visit <https://camosun.ca/sites/default/files/2021-05/e-2.2.pdf> for further details about course withdrawals. For deadline for fees, course drop dates, and tuition refund, please visit <https://camosun.ca/registration-records/tuition-fees#deadlines>.

### Grading Policy

Please visit <https://camosun.ca/sites/default/files/2021-05/e-1.5.pdf> for further details about grading.

### Grade Review and Appeals

Please visit <https://camosun.ca/sites/default/files/2021-05/e-1.14.pdf> for policy relating to requests for review and appeal of grades.

### Medical / Compassionate Withdrawals

Students who are incapacitated and unable to complete or succeed in their studies by virtue of serious and demonstrated exceptional circumstances may be eligible for a medical/compassionate withdrawal (see [Medical/Compassionate Withdrawals policy](#)). Please visit <https://camosun.ca/services/forms#medical> to learn more about the process involved in a medical/compassionate withdrawal.

## Sexual Violence

Camosun is committed to creating a campus culture of safety, respect, and consent. Camosun's Office of Student Support is responsible for offering support to students impacted by sexual violence. Regardless of when or where the sexual violence occurred, students can access support at Camosun. The Office of Student Support will make sure students have a safe and private place to talk and will help them understand what supports are available and their options for next steps. The Office of Student Support respects a student's right to choose what is right for them. For more information see Camosun's Sexualized Violence Policy: <https://camosun.ca/sites/default/files/2021-05/e-2.9.pdf> and [camosun.ca/services/sexual-violence-support-and-education](https://camosun.ca/services/sexual-violence-support-and-education).

To contact the Office of Student Support: [oss@camosun.ca](mailto:oss@camosun.ca) or by phone: 250-370-3046 or 250-370-3841

## Student Misconduct (Non-Academic)

Camosun College is committed to building the academic competency of all students, seeks to empower students to become agents of their own learning, and promotes academic belonging for everyone. Camosun also expects that all students to conduct themselves in a manner that contributes to a positive, supportive, and safe learning environment. Please review Camosun College's Student Misconduct Policy at <https://camosun.ca/sites/default/files/2021-05/e-2.5.pdf> to understand the College's expectations of academic integrity and student behavioural conduct.

## Looking for other policies?

The full suite of College policies and directives can be found here: <https://camosun.ca/about/camosun-college-policies-and-directives>

**Changes to this Syllabus:** Every effort has been made to ensure that information in this syllabus is accurate at the time of publication. The College reserves the right to change courses if it becomes necessary so that course content remains relevant. In such cases, the instructor will give the students clear and timely notice of the changes.