



COURSE OUTLINE

1. **Course:** BCEM 411, Laboratory Techniques I - Fall 2020

Lecture 01: TR 09:30 - 10:45

Instructor	Email	Phone	Office	Hours
Dr Gregory Moorhead	moorhead@ucalgary.ca	403 220-6238	BI 144	TBA
Dr. Marie Fraser	frasm@ucalgary.ca	403 220-6145	BI 413	TBA

In Person Delivery Details:

Labs, lectures, and midterm exams will be in-person.

Lectures will be in ST 131. Please wear your masks into the lecture room and distribute yourselves 2 m apart, filling the room from the centre so that no student will have to pass near another student.

Labs will be in BI 117 and BI 136. Computer rooms BI 190 and BI 182 will also be used during the first two weeks' labs. Additional information about safety protocols will be provided during the first class.

Please read the safety information: <https://ucalgary.ca/risk/emergency-management/covid-19-response/return-campus-safety> including the 'COVID-19 campus safety guide for students'.

Course Site:

D2L: BCEM 411 L01-(Fall 2020)-Laboratory Techniques I

Note: Students must use their U of C account for all course correspondence.

2. **Requisites:**

See section [3.5.C](#) in the Faculty of Science section of the online Calendar.

Prerequisite(s):

Biochemistry 393; and Chemistry 353 or 355.

Antirequisite(s):

Credit for Biochemistry 411 and either of Biochemistry 401 or 403 will not be allowed.

3. **Grading:**

The University policy on grading and related matters is described in [F.1](#) and [F.2](#) of the online University Calendar.

In determining the overall grade in the course the following weights will be used:

Component	Weighting
Midterm Exam 1 (in class on Oct 6)	20%
Midterm Exam 2 (in class on Nov 5)	30%
Final exam (in person - registrar scheduled)	20%
Labs 1-3, 2% each (assigned questions)	6%
Labs 4-9; 1% each (short reports)	6%
Labs 5-9 combined as a protein purification paper	5%
Labs 10 and 11; 5% each (full reports)	10%
Lab book, practical assessment	3%

A mark of $\geq 50\%$ is the minimal passing grade for the lab component of this course.

A failing grade will result if the student does not pass the combined lab component which consists of all components except the exams.

Each piece of work (reports, assignments, quizzes, midterm exam(s) or final examination) submitted by the student will be assigned a grade. The student's grade for each component listed above will be combined with the indicated weights to produce an overall percentage for the course, which will be used to determine the course

letter grade.

The conversion between a percentage grade and letter grade is as follows.

	A+	A	A-	B+	B	B-	C+	C	C-	D+	D
Minimum % Required	94 %	86 %	82 %	78%	74%	70 %	66 %	62%	58%	54 %	50 %

This course has a registrar scheduled final exam.

4. **Missed Components Of Term Work:**

The university has suspended the requirement for students to provide evidence for absences. Please do not attend medical clinics for medical notes or Commissioners for Oaths for statutory declarations.

In the event that a student legitimately fails to submit any online assessment on time (e.g. due to illness etc...), please contact the course coordinator, or the course instructor if this course does not have a coordinator to arrange for a re-adjustment of a submission date. Absences not reported within 48 hours will not be accommodated. If an excused absence is approved, then the percentage weight of the legitimately missed assignment could also be pro-rated among the components of the course.

5. **Scheduled Out-of-Class Activities:**

There are no scheduled out of class activities for this course.

6. **Course Materials:**

In order to successfully engage in their learning experiences at the University of Calgary, students taking online, remote and blended courses are required to have reliable access to the following technology:

- A computer with a supported operating system, as well as the latest security, and malware updates;
- A current and updated web browser;
- Webcam/Camera (built-in or external);
- Microphone and speaker (built-in or external), or headset with microphone;
- Current antivirus and/or firewall software enabled;
- Stable internet connection.

For more information please refer to the UofC [ELearning](#) online website.

7. **Examination Policy:**

No aids are allowed on tests or examinations.

Students should also read the Calendar, [Section G](#), on Examinations.

8. **Approved Mandatory And Optional Course Supplemental Fees:**

There are no mandatory or optional course supplemental fees for this course.

9. **Writing Across The Curriculum Statement:**

For all components of the course, in any written work, the quality of the student's writing (language, spelling, grammar, presentation etc.) can be a factor in the evaluation of the work. See also Section [E.2](#) of the University Calendar.

10. Human & Living Organism Studies Statements:

Students will not participate as subjects or researchers in human studies.

See also [Section E.5](#) of the University Calendar.

STUDIES IN THE BIOLOGICAL SCIENCES INVOLVE THE USE OF LIVING AND DEAD ORGANISMS. Students taking laboratory and field-based courses in these disciplines can expect involvement with and experimentation on such materials. Students perform dissections on dead or preserved organisms in some courses. In particular courses, students experiment on living organisms, their tissues, cells, or molecules. Sometimes field work requires students to collect a variety of living materials by many methods, including humane trapping.

All work on humans and other animals conforms to the Helsinki Declaration and to the regulations of the Canadian Council on Animal Care. The Department strives for the highest ethical standards consistent with stewardship of the environment for organisms whose use is not governed by statutory authority. Individuals contemplating taking courses or majoring in one of the fields of study offered by the Department of Biological Sciences should ensure that they have fully considered these issues before enrolling. Students are advised to discuss any concern they might have with the Undergraduate Program Director of the Department.

Students are expected to be familiar with [Section SC.4.1](#) of the University Calendar.

11. Reappraisal Of Grades:

A student wishing a reappraisal, should first attempt to review the graded work with the Course coordinator/instructor or department offering the course. Students with sufficient academic grounds may request a reappraisal. Non-academic grounds are not relevant for grade reappraisals. Students should be aware that the grade being reappraised may be raised, lowered or remain the same. See [Section I.3](#) of the University Calendar.

- a. **Term Work:** The student should present their rationale as effectively and as fully as possible to the Course coordinator/instructor within **ten business days** of either being notified about the mark, or of the item's return to the class. If the student is not satisfied with the outcome, the student shall submit the Reappraisal of Graded Term work form to the department in which the course is offered within 2 business days of receiving the decision from the instructor. The Department will arrange for a reappraisal of the work within the next ten business days. The reappraisal will only be considered if the student provides a detailed rationale that outlines where and for what reason an error is suspected. See sections [I.1](#) and [I.2](#) of the University Calendar
- b. **Final Exam:** The student shall submit the request to Enrolment Services. See [Section I.3](#) of the University Calendar.

12. Other Important Information For Students:

- a. **Mental Health** The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the mental health resources available throughout the university community, such as counselling, self-help resources, peer support or skills-building available through the SU Wellness Centre (Room 370, MacEwan Student Centre, [Mental Health Services Website](#)) and the Campus Mental Health Strategy website ([Mental Health](#)).
- b. **SU Wellness Center:** For more information, see www.ucalgary.ca/wellnesscentre or call [403-210-9355](tel:403-210-9355).
- c. **Sexual Violence:** The Sexual Violence Support Advocate, Carla Bertsch, can provide confidential support and information regarding sexual violence to all members of the university community. Carla can be reached by email (syva@ucalgary.ca) or phone at [403-220-2208](tel:403-220-2208). The complete University of Calgary policy on sexual violence can be viewed at (<https://www.ucalgary.ca/policies/files/policies/sexual-violence-policy.pdf>)
- d. **Misconduct:** Academic misconduct (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under [Section K](#). Student Misconduct to inform yourself of definitions, processes and penalties. Examples of academic misconduct may include: submitting or presenting work as if it were the student's own work when it is not; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; collaborating in whole or in part without prior agreement of the instructor; borrowing experimental values from others without the instructor's approval; falsification/ fabrication of experimental values in a report. **These are only examples.**
- e. **Academic Accommodation Policy:** Students needing an accommodation because of a disability or medical condition should contact Student Accessibility Services in accordance with the procedure for

accommodations for students with disabilities available at [procedure-for-accommodations-for-students-with-disabilities.pdf](#).

Students needing an accommodation in relation to their coursework or to fulfill requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to the Associate Head, Undergraduate of the Department of Biological Sciences, Heather Addy by email addy@ucalgary.ca or phone 403 220-6979. Religious accommodation requests relating to class, test or exam scheduling or absences must be submitted no later than **14 days** prior to the date in question. See [Section E.4](#) of the University Calendar.

- f. **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). Students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information, see [Legal Services](#) website.
- g. **Student Union Information:** [VP Academic](#), Phone: [403-220-3911](tel:403-220-3911) Email: suvpaca@ucalgary.ca. SU Faculty Rep., Phone: [403-220-3913](tel:403-220-3913) Email: sciencerep@su.ucalgary.ca. [Student Ombudsman](#), Email: ombuds@ucalgary.ca.
- h. **Surveys:** At the University of Calgary, feedback through the Universal Student Ratings of Instruction ([USRI](#)) survey and the Faculty of Science Teaching Feedback form provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses. Your responses make a difference - please participate in these surveys.
- i. **Copyright of Course Materials:** All course materials (including those posted on the course D2L site, a course website, or used in any teaching activity such as (but not limited to) examinations, quizzes, assignments, laboratory manuals, lecture slides or lecture materials and other course notes) are protected by law. These materials are for the sole use of students registered in this course and must not be redistributed. Sharing these materials with anyone else would be a breach of the terms and conditions governing student access to D2L, as well as a violation of the copyright in these materials, and may be pursued as a case of student academic or [non-academic misconduct](#), in addition to any other remedies available at law.

BCEM411 Fall 2020: Lecture Schedule

Date Topic Instructor

Sept	8	Introduction to the course/ basic techniques	GM/MF
	8/10	Lab 1: Reference management*, LAB: Safety Basic Techniques	MF
	10	Preparation for Protein Bioinformatics Lab	MF
	15	Preparation for Protein Bioinformatics Lab (cont'd)	MF
	15/17	Lab 2: Protein Bioinformatics Lab	MF
	17	Preparation for Protein Absorbance and Concentration Lab	MF
	22	Scientific Writing	MF
	22/24	Lab 3: Protein Absorbance and Concentration	MF
	24	Preparation for Working with Proteins	MF
	29	Why proteins/ purification overview	GM
	29/1	Lab 4: Working with Proteins	MF
Oct	1	Enzyme assays/ cell biology	GM
	6	MIDTERM - in class -	MF
	6/8	No lab week of midterm	GM
	8	Generic strategy/ sample sources (recombinant and model)	GM
	13	Purification goals/ protein properties/ sample preparation/ precipitation	GM
	13/15	Lab 5: β-galactosidase assays and background search	GM
	15	Organelles/ differential centrifugation/ sample handling/ review	MF
	20	Chromatography principles/ Ion exchange chromatography	GM
	20/22	Lab 6: Ammonium sulfate precipitation of β-galactosidase	GM
	22	Ion exchange chromatography /Case study #1	GM
	27	Size exclusion/ gel filtration chromatography / Case study #2	GM
	27/29	Lab 7: Ion exchange chromatography of β-galactosidase	GM
	29	Hydrophobic interaction chromatography (HIC)/ Case study #3	GM
Nov	3	SDS-PAGE vs native/ Protein storage/ Case study #4	GM
	3/5	Lab 8: Gel filtration chromatography of β-galactosidase	GM
	5	MIDTERM - in class -	GM
	10	TERM BREAK NO CLASSES	GM
	10/12	No lab this week	GM
	12	TERM BREAK NO CLASSES	GM
	17	Antibodies as a tool in biochemistry	GM

	17/19	Lab 9: SDS PAGE of β-galactosidase	GM
	19	Antibodies as a tool in biochemistry	GM
	24	Affinity chromatography	GM
	24/26	Lab 10: Western blotting/ Native PAGE	GM
	26	Affinity chromatography	GM
	1	Modern use of affinity chromatography: The target landscape of clinical kinase drugs	GM
	1/3	Lab 11: His-tag chromatography	GM
Dec	3	Case study #5???	GM
	8	Review session	GM

Electronically Approved - Sep 04 2020 10:57

Department Approval

Electronically Approved - Sep 05 2020 12:01

Associate Dean's Approval