



UNIVERSITY OF CALGARY

DEPARTMENT OF BIOLOGICAL SCIENCES COURSE OUTLINE

1. **Course:** BIOCHEMISTRY 401 – Biochemistry Laboratory Techniques I

LECTURE:	L01:	TR	9:30-10:45	KNB 128	FALL 2014
Instructor(s):	Dr. V. Zarembeg		220-4298	BI 390	vzarembeg@ucalgary.ca
	Dr. R.A. Edwards		220-5350	BI 443	redwards@ucalgary.ca
	Dr. S. Zimmerly		220-7933	BI 319C	zimmerly@ucalgary.ca

Desire 2 Learn (D2L) course name: BCEM401 F2013 Biochem Lab Techniques I

Biological Sciences Department BI 186; 220-3140; biosci@ucalgary.ca

2. **Prerequisites:** One of Chemistry 353 or 355; and Biochemistry 393

See section 3.5.C in the Faculty of Science section of the online Calendar (www.ucalgary.ca/pubs/calendar/current/sc-3-5.html)

Antirequisites: Credit for both Biochemistry 401 and either 541 or CMMB 451 will not be allowed.

3. **Grading:** The University policy on grading and related matters is described sections [F.1](#) and [F.2](#) of the online University Calendar. In determining the overall grade in the course the following weights will be used:

Midterm Exam	25%
Final Exam	25%
Long Lab Reports & Assignment (2x6%)	12%
Medium Lab Reports (6x4%)	24%
Short Lab Reports (3x2%)	6%
Practical Assessment	4%
Lab Book	4%

A mark of $\geq 58\%$ is required on the laboratory portion of this course (all components except the exams) to pass the course as a whole.

Each piece of work (assignment, laboratory report, midterm test or final examination) submitted by the student will be assigned a percentage score. The student's average percentage score for the various components 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, (bearing in mind that an F grade will result if the student does not pass the laboratory component).

4. **Missed Components of Term Work:** The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar in [Section 3.6](#). It is the student's responsibility to familiarize himself/herself with these regulations. See also [Section E.6](#) of the University Calendar

5. **Scheduled out-of-class activities:** Dates and times of approved class activities held outside of class hours.

MIDTERM EXAM- Oct 30-2014 8:30-10:45 am. Room TBA

REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME-ACTIVITY. If you have a clash with this out-of-class-time-activity, please inform your instructor as soon as possible so that alternative arrangements may be made for you.

6. **Course Materials:** All materials including lecture notes and lab manuals will be available in D2L

7. **Examination Policy:** The use of wireless access devices such as cell phones, PDAs (Palm OS or Pocket PC devices, etc.) during the examination will not be allowed. Students should also read the Calendar, [Section G](#), on Examinations.

8. **Writing across the curriculum statement:** In this course, the quality of the student's writing in laboratory reports will be a factor in the evaluation of those reports. See also [Section E.2](#) of the University Calendar.

ETHICS IN THE BIOLOGICAL SCIENCES

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.

10. OTHER IMPORTANT INFORMATION FOR STUDENTS:

- (a) **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
- (b) **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on [assembly points](#).
- (c) **Academic Accommodation Policy:** Students with documentable disabilities are referred to the following links: [Calendar entry on students with disabilities](#) and [Student Accessibility Services](#).
- (d) **Safewalk:** Campus Security will escort individuals day or night (<http://www.ucalgary.ca/security/safewalk/>). Call 220-5333 for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.
- (e) **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). As one consequence, 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 also
- (f) <http://www.ucalgary.ca/secretariat/privacy>
- (g) **Student Union Information:** VP Academic Phone: 220-3911 Email: suvpaca@ucalgary.ca.
SU Faculty Rep. Phone: 220-3913 Email: sciencerep@su.ucalgary.ca; [Student Ombudsman](#)
- (h) **Internet and Electronic Device Information:** You can assume that in all classes that you attend, your cell phone should be turned off unless instructed otherwise. Also, communication with other individuals, via laptop computers, Blackberries or other devices connectable to the Internet is not allowed in class time unless specifically permitted by the instructor. If you violate this policy you may be asked to leave the classroom. Repeated abuse may result in a charge of misconduct.
- (i) At the University of Calgary, feedback provided by students through the Universal Student Ratings of Instruction (USRI) survey provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses (www.ucalgary.ca/usri). Your responses make a difference - please participate in USRI Surveys.

Department Approval _____ Date _____

Associate Dean's Approval for
out of regular class-time activity: _____ Date: _____

TERM: Fall 2014

PREREQUISITE(S): One of Chemistry 353 or 355; and Biochemistry 393

Antirequisite(s): Credit for both Biochemistry 401 and either BCEM 541 or CMMB 451 will not be allowed.

Students may not register in a course unless they have a grade of at least C- in each prerequisite course.

COURSE COORDINATOR: Dr. V. Zarembeg

LECTURERS: Dr. R.A. Edwards BI 443 220-5350 redwards@ucalgary.ca
Dr. V. Zarembeg BI 461 220-4298 vzarembe@ucalgary.ca
Dr. S. Zimmerly BI 319C 220-7933 zimmerly@ucalgary.ca

LECTURES: TR 09:30 KNB 128

LABS: B01 Wed 1300-1850 BI 117
B02 Thurs 1100-1650 BI 117

TEXT: None

MARK DISTRIBUTION: A. Composition of Final Grade

Midterm Exam	25%
Final Exam	25%
Long Lab Reports & Assignment (2x6%)	12%
Medium Lab Reports (6x4%)	24%
Short Lab Reports (3x2%)	6%
Practical Assessment	4%
Lab Book	4%

B. Final Exam

There will be a final examination scheduled by the Registrar's Office.

C. Components of course for which a passing grade is essential

Lab Assessment. A mark of $\geq 58\%$ is required on the laboratory portion of this course (all components except the exams) to pass the course as a whole

D. Grade Scale

Lab Grade Scale

86% \Rightarrow A
82 \Rightarrow A-
78 \Rightarrow B+
74 \Rightarrow B
70 \Rightarrow B-
66 \Rightarrow C+
62 \Rightarrow C
58 \Rightarrow C-
54 \Rightarrow D+
50 \Rightarrow D
< 50% \Rightarrow F

$\geq 58\%$ \Rightarrow pass

BCEM 401 – Biochemistry Laboratory Techniques I
TENTATIVE SCHEDULE (Due dates for the reports are in red)

Week	Month	Day		Description of Lectures and Labs
1	Sept	9	VZ-RAE	Introduction to the Course and to the labs.
1	Sept	10, 11	RAE –Lab	Library -End-Note*, LAB: Safety and Basic Techniques Report is 2% → Sept 17 & 18
1	Sept	11	SZ - 1	Nucleotide structures, DNA and RNA structures
2	Sept	16	SZ - 2	Enzymes, central dogma, prokaryotic/eukaryotic gene structures
2	Sept	17,18	SZ – Lab	LAB: Nucleic Acids *Bioinformatics Lab Report is 4 %→ Sept 24 & 25
2	Sept	18	SZ – 3	Plasmid structure, purification of nucleic acids, separation of DNA
3	Sept	23	SZ – 4	Southern, northern blots, hybridization
3	Sept	24, 25	VZ – Lab	LAB: Basic Techniques for Rec DNA Manipulation Report is 2%→ Oct 1 & 2
3	Sept	25	SZ – 5	PCR, colony PCR, primer design, real-time PCR
4	Sept	30	VZ -1	Cloning I: Restriction Enzymes
4	Oct	1, 2	VZ – Lab	LAB: Recombinant DNA Techniques-1 Report is 4%→ Oct 8 & 9
4	Oct	2	VZ -2	Cloning II: Cloning Vectors
5	Oct	7	VZ -3	Cloning III: transformations and screening recombinants
5	Oct	8, 9	VZ – Lab	LAB: Recombinant DNA Techniques-2 Report is 2%→ Oct 15 & 16
5	Oct	9	VZ -4	Cloning IV: Sources of DNA for cloning
6	Oct	14	VZ -5	Expression vectors
6	Oct	15, 16	VZ – Lab	LAB: Recombinant DNA Techniques-3 Cloning Assignment is 6% →Oct 22 & 23
6	Oct	16	VZ -6	Sequencing
7	Oct	21	VZ -7	Other cloning strategies
7	Oct	22, 23	VZ – Lab	LAB: Recombinant DNA Techniques-4 Report is 4%→ Nov 5 & 6
7	Oct	23	VZ -8	Mutagenesis
8	Oct	28	VZ -9	Overflow and Review
8	Oct/Nov	29, 30	VZ – Lab	LAB: Recombinant DNA Techniques-5 Report is 6%→ Nov 12 & 13
8	Oct	30	SZ & VZ	Midterm Exam- 8:30-10-45 am- room TBA
9	Nov	4	RAE-2	Proteins - properties and activities
9	Nov	5, 6		No lab - Finish writing report (see previous)
9	Nov	6	RAE-3	Preparation for Protein Bioinformatics Lab

10	Nov	11		***** Reading Day – no lecture *****
10	Nov	12, 13	RAE – Lab	LAB: Protein *Bioinformatics Lab Report is 4%→ Nov 19 & 20
10	Nov	13	RAE-4	Preparation for protein absorbance and concentration lab.
11	Nov	18	RAE-5	Refolding of proteins from inclusion bodies
11	Nov	19, 20	RAE - Lab	LAB: Protein Absorbance and Concentration Report is 4%→ Nov 26 & 27
11	Nov	20	RAE-6	Preparation for Working with Proteins lab.
12	Nov	25	SZ – 6	Sequencing technologies – 1
12	Nov	26, 27	RAE - Lab	LAB: Working with Proteins. Report is 4%→ Dec 3 & 4
12	Nov	27	SZ – 7	Sequencing technologies-2
13	Dec	2	SZ – 8	Micro-arrays and other genomic methods
13	Dec	3, 4		LAB: Data analysis & Writing the final lab report.
13	Dec	4	SZ - 9	Overflow and Review
Exam period	Dec	TBA	SZ & RAE	FINAL exam scheduled by the Registrar (3 hours)