



# UNIVERSITY OF CALGARY

## DEPARTMENT OF BIOLOGICAL SCIENCES COURSE OUTLINE

1. **Course:** BIOCHEMISTRY 555 - BIOMEMBRANES

Lecture Section(s): L01 MWF 10:00-10:50 MS 217 FALL 2014  
T01 W 16:00-16:50 MS 211

**Instructor(s):** Dr. R.J. Turner BI 487 220-4308 turnerr@ucalgary.ca  
Dr. E.J. Prenner BI 145A 220-7632 eprenner@ucalgary.ca  
Dr. S. Noskov BI 447 210-7971 snoskov@ucalgary.ca

Desire 2 Learn (D2L) course: F2014BCEM555L01

Biological Sciences Department BI 186 403-220-3140 biosci@ucalgary.ca

2. **Prerequisites:** Biochemistry 393 or 443  
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](http://www.ucalgary.ca/pubs/calendar/current/sc-3-5.html)

**Note:** Prior or concurrent completion of Biochemistry 431 and 471 is strongly recommended.

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:

<b>Midterm Exam I</b>	<b>Oct 8/14</b>	<b>30 %</b>	<b>During class time</b>
<b>Midterm Exam II</b>	<b>Nov 7/14</b>	<b>30 %</b>	<b>During class time</b>
<b>Final Exam</b>		<b>40 %</b>	<b>Registrar scheduled.</b>

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.

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. **Course Materials:** Available on D2L course site

6. **Examination Policy:** Exams will be closed book and calculators will be required for the first midterm exam. Students should also read the Calendar, [Section G](#), on Examinations.

## 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.

### 7. 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](mailto:suvpaca@ucalgary.ca).  
SU Faculty Rep. Phone: 220-3913 Email: [sciencerep@su.ucalgary.ca](mailto: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](http://www.ucalgary.ca/usri)). Your responses make a difference - please participate in USRI Surveys.

Department Approval \_\_\_\_\_ Date \_\_\_\_\_

COURSE OUTLINE

BIOCHEMISTRY 555  
BIOMEMBRANES

TERM:

Fall 2014

SECTION NO: 01

PREREQUISITE(S): Biochemistry 393 or 443

Note: Prior or concurrent completion of Biochemistry 431 and 471 is strongly recommended.

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

The structure and function of biomembranes, transport through membranes, the structure of integral membrane proteins, protein secretion and assembly of membrane proteins, will be emphasized. A knowledge of biochemistry at the BCEM 393 level is required.

LECTURER(S):	Dr. R.J Turner	BI 487	220-4308
	Dr. E.J. Prenner	BI 145A	220-7632
	Dr. S. Noskov	BI 447	210-7971

COURSE COORDINATOR: Dr. R. Turner

LECTURES: MWF 10:00-10:50 MS 217

TUTORIAL: W 16:00-16:50 MS 211

TEXT: Required: None

Materials provided on the D2L course site.

RESERVE READING ROOM: See attached.

MARK DISTRIBUTION: A. Composition of Final Grade

<b>Midterm Exam I</b>	<b>Oct 8/14</b>	<b>30 %</b>
<b>Midterm Exam II</b>	<b>Nov 7/14</b>	<b>30%</b>
<b>Final Exam</b>		<b>40 %</b>

Conversion between course percentage and letter grade for BCEM555

<b>Letter Grade</b>	<b>Course Percentage</b>
A+	Reserved for outstanding distinguished performance
A	85
A-	80
B+	77
B	74
B-	71
C+	68
C	65
C-	60
D+	55
D	50
F	<50

**Topics**

**Dr. Prenner**

Structure and properties of membrane lipids  
Biophysical chemistry of lipid bilayers

**Dr. Noskov**

Membrane dynamics  
Transport Energetics of Biomembranes  
Ion channels

**Dr. Turner**

Membrane proteins  
    Classification  
    Purification  
    Examples of membrane protein functions  
        Receptors  
        Transporters  
        Proton Pumps  
Structural biology of membrane proteins  
Experimental approaches to membrane proteins  
Protein Secretion  
Protein Translocation

**Guest lectures from**

**Dr. Bay**

Beta barrel proteins

**Mark Distribution**

Midterm I	30%	<u>Prenner, Noskov</u>
Midterm II	30%	<u>Turner, Bay</u>
Final	40%	<u>Turner</u>