



# UNIVERSITY OF CALGARY

## DEPARTMENT OF BIOLOGICAL SCIENCES COURSE OUTLINE

**1. Course:** BIOCHEMISTRY 547 – SIGNAL TRANSDUCTION AND REGULATION OF METABOLISM

Lecture Section(s): L01: TR 12:30-13:45 SS 109 FALL 2014

Desire to Learn (D2L) course name: F2014BCEM547L01 - BCEM 547 L01

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)

**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:

In-Class Exam 1	(Oct. 7/14)	35 %
In-Class Exam 2	(Nov. 6/14)	32.5 %
Final Exam	TBA	32.5 %

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

**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:** "Biochemistry 547 Lecture Notes" by G. Moorhead, SP Lees-Miller and A Goodarzi (2014) will be available on D2L for use during all lectures.

**6. Examination Policy:** Students should also read the Calendar, [Section G](#), on Examinations.

**7.** In this course, the quality of the student's writing will be a factor in the evaluation of exams. 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.

## 8. 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 (FOIPPA). 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: <http://www.ucalgary.ca/secretariat/privacy>.
- (f) **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](#)
- (g) **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.
- (h) 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 \_\_\_\_\_

C547 F14; 8/28/2014 1:26 PM

# COURSE OUTLINE

## BIOCHEMISTRY 547

### Signal Transduction and Regulation of Metabolism

TERM: Fall 2014 SECTION NO: 01

PREREQUISITE(S): Biochemistry 393 or 443

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

LECTURER(S): Dr. G.B.G. Moorhead

LECTURES: TR 12:30 SS 109

TEXT: Required: "Biochemistry 547 Lecture Notes" by G. Moorhead, SP Lees-Miller and A Goodarzi (2013) will be available on D2L for use during all lectures.

The role of protein kinases and protein phosphatases in the regulation of metabolic and signal transduction pathways will be emphasized. Knowledge of Biochemistry at the BCEM 393 level and of Signal Transduction/ Cell Biology at the BIOL 331 level is expected.

RESERVE READING ROOM: Multiple copies of the textbook, Cell and Molecular Biology: Concepts and Experiments by Gerald Karp, are available.

#### MARK DISTRIBUTION:

##### A. Composition of Final Grade

<u>Dates</u>	<u>Weighting</u>
In-Class Exam 1 (Oct. 7/14)	35 %
In-Class Exam 2 (Nov. 6/14)	32.5 %
Final Exam TBA	32.5 %

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

##### B. Grade Scale

#### Letter Grade Mark Cut Off

A+	90
A	85
A-	80
B+	75
B	70
B-	65
C+	60
C	55
C-	50
D	48
F	<47

## BIOCHEMISTRY 547

### LECTURE OUTLINE

1	Tuesday	September 9	Introduction to signal transduction	GBGM
2	Thursday	September 11	Protein modifications and interaction domains	GBGM
3	Tuesday	September 16	G-protein coupled receptor pathways	GBGM
4	Thursday	September 18	Second messengers, lipid kinases	GBGM
5	Tuesday	September 23	Protein kinase structure and function	GBGM
6	Thursday	September 25	Protein phosphatase structure and function	GBGM
7	Tuesday	September 30	MAP kinase pathway, insulin signaling	GBGM
8	Thursday	October 2	Ca <sup>2+</sup> -CaM, pathway cross talk	GBGM
9	<b>Tuesday</b>	<b>October 7</b>	<b>In class test 1</b>	GBGM
10	Thursday	October 9	Nitrogen metabolism	GBGM
11	Tuesday	October 14	Sensing nitrogen status	GBGM
12	Thursday	October 16	Stress signaling: amino acids	GBGM
13	Tuesday	October 21	Stress signaling: glucose and snf1	GBGM
14	Thursday	October 23	AMP-activated PK (AMPK)	GBGM
15	Tuesday	October 28	Glycogen metabolism	GBGM
16	Thursday	October 30	Paper discussion	GBGM
17	Tuesday	November 4	Paper discussion	GBGM
	<b>Thursday</b>	<b>November 6</b>	<b>In class test 2</b>	GBGM
<b>November 8-11 READING DAYS – NO LECTURES</b>				
18	Thursday	November 13	Target of Rapamycin signaling	GBGM
19	Tuesday	November 18	DNA damage response	SPLM
20	Thursday	November 20	DNA damage response	SPLM
21	Tuesday	November 25	The Cell Cycle and DNA damage response	AG
22	Thursday	November 27	Chromatin Dynamics and Epigenetics	AG

23	Tuesday	December 2	Chromatin Dynamics and the Cell Cycle	AG
24	Thursday	December 4	Chromatin Dynamics and the DNA damage response	AG