



UNIVERSITY OF CALGARY
FACULTY OF SCIENCE
DEPARTMENT OF BIOLOGICAL SCIENCES
COURSE OUTLINE

1. **Course: BIOCHEMISTRY 575 – LIPIDS**

Lecture Sections: L01 TR 11:00-12:15 ST 057 WINTER 2018
Tutorial Sections: T01/02 T/R 2:00-2:50 SA 109/561

Course Coordinator: Dr. V. Zarembeg

Instructors: Dr. V. Zarembeg BI 390 220-4298 vzarembeg@ucalgary.ca
Dr. E. Prenner BI 145A 220-7632 eprenner@ucalgary.ca

Course website or Desire 2 Learn (D2L) course name: BCEM 575
Biological Sciences Department BI 186; (403) 220-3140; biosci@ucalgary.ca

2. **PREREQUISITE(S):** Biochemistry 393 and one of Biochemistry 401 or 443

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

3. **Grading:** The University policy on grading and related matters is described in 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	34%	March 1	In-Class
Tutorial/Assignment/Participation	32%		
Final Exam	34%		

There will be a final examination scheduled by the Registrar.

Letter Grade	A+	A	A-	B+	B	B-	C+	C	C-	D+	D
Min. Percent Required	92	86	82	78	74	70	66	62	58	54	50

Each piece of work (presentations, assignment, 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. **Scheduled out-of-class activities:** Dates and times of approved class activities held outside of class hours. N/A

REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME-ACTIVITY.

6. **Course Materials:** N/A

7. **Examination Policy:** Exams are open book. 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 the assignment will be a factor in its evaluation. See also Section E.2 of the University Calendar.

9. **OTHER IMPORTANT INFORMATION FOR STUDENTS:**

- (a) **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.
- (b) **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on [assembly points](#).
- (c) **Student Accommodations:** 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 http://www.ucalgary.ca/policies/files/policies/procedure-for-accommodations-for-students-with-disabilities_0.pdf.
- Students needing an Accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a Protected Ground other than Disability, should communicate this need, preferably in writing, to the Associate Head of Biological Sciences, Dr. H. Addy by email addy@ucalgary.ca or phone 403 220-3140.
- (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: 403 220-3911 Email: suvpaca@ucalgary.ca
SU Faculty Rep. Phone: 403 220-3913 Email: science1@su.ucalgary.ca, science2@su.ucalgary.ca and science3@su.ucalgary.ca;
Student Ombuds Office: 403 220-6420 Email: ombuds@ucalgary.ca; <http://ucalgary.ca/provost/students/ombuds>
- (f) **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.
- (g) **U.S.R.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 _____ ORIGINAL SIGNED _____ Date _____

Learning outcomes

By the end of this course, successful students will be able to:

1. Describe the structure and biophysical properties of all lipid classes including glycerolipids, sphingolipids and sterols.
2. Recognize the differential contributions of individual lipids to cellular membranes.
3. Understand the major differences in membrane organization and lipid composition of cellular membranes in eukaryotic and prokaryotic cells
4. Explain metabolic pathways involved in synthesis and turnover of lipids
5. Identify key points of regulation in lipid metabolic pathways and the role of bioactive lipids in cellular signaling
6. Critically read and understand research papers related to the lipid field
7. Explain and interpret data from a broad range of approaches used to study biophysical properties of lipids and membranes, lipid-lipid interactions, lipid-protein interactions and lipid metabolism
8. Analyze and rationalize cellular strategies for maintenance of lipid homeostasis
9. Apply what they have learned in goals 1-8 to interpret data and defend their rationales and ideas when confronted with working (in progress) models related to the lipid field
10. Research the literature in order to recognize gaps in knowledge, challenge and question current accepted beliefs in the lipid field
11. Give oral presentations and discuss published research work in a critical way, both in groups and individually

Tentative Lecture/ Tutorial Plan

Week#1			
Jan.	9	Course introduction and organization	EP/VZ
	9	no tutorial	
	11	Introduction to lipid and lipid structure	lecture EP
	11	no tutorial	
Week#2			
Jan.	16	Properties of membrane lipids and bilayers	lecture EP
	16	no tutorial	
	18	Model Systems	lecture EP
	18	no tutorial	
Week#3			
Jan	23	Biophysical methods	lecture EP
	23	Tutorial-1-group-1	
	25	Permeability, electrical properties Membrane potentials	lecture EP
	25	Tutorial-1group-2	
Week#4			
Jan	30	Lipid signaling (ceramide)	lecture EP
	30	Tutorial 2 paper 1-1	
Feb.	1	Membrane Fusion	lecture EP
	1	Tutorial 2: paper 1-2	
Week#5			
Feb.	6	Biomembrane and mem genesis	lecture EP
	6	Tutorial 3 paper 2-1	
	8	Antimicrobial peptides	lecture EP
	8	Tutorial 3: paper 2-2	
Week#6			
Feb.	13	Lipids and Pathogenesis	lecture EP
	13	Tutorial 4: paper 3-1	
	15	Lipid metal interactions (Kevin guest lecture)	lecture EP
	15	Tutorial 4: paper 3-2	
Week#7			
Feb.	27	Review	lecture EP
	27	no Tutorial	
Mar	1	Midterm exam	Material EP
	1	no tutorial	
Week#8			
Mar	6	Lipid metabolism- Fatty acids	lecture VZ
	6	no tutorial	
	8	Fatty acid elongation and desaturation- Beta oxidation	lecture VZ
	8	no tutorial	
Week#9			
Mar.	13	Lipid metabolism- Phospholipid	lecture VZ
	13	no tutorial	
	15	Lipid metabolism-TAG-sphingolipids-cholesterol	lecture VZ
	15	no tutorial	
Week#10			
Mar.	20	Lipid metabolism- bacteria	lecture VZ
	20	Tutorial 5 Paper 4-1	
	22	Lipid metabolism- remodeling and turnover	lecture VZ
	22	Tutorial 5 Paper 4-2	

Week#11

Mar.	27	Lipid signaling Bioactive lipids	lecture VZ
	27	Tutorial 6 Paper 5-1	
	29	Lipid signaling-Bioactive lipids	lecture VZ
	29	Tutorial 6 Paper 5-2	

Week#12

Apr.	3	Lipid transport	lecture VZ
	3	Tutorial 7 paper 6-1	
	5	Lipid transport	lecture VZ
	5	Tutorial 7 paper 6-2	

Week#13

Apr.	10	Lipid rafts debate	lecture VZ
	10	no tutorial	
	12	Review	VZ

FINAL EXAM SCHEDULED BY THE REGISTRAR