



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

1. **Course: Biochemistry 341 - BIOCHEMISTRY OF LIFE PROCESSES**

Lecture Section: L01 MWF 13:00-13:50 ST 139 WINTER 2016

Instructors: Dr. E. Lohmeier-Vogel BI 039 403-220-8281 lohmeier@ucalgary.ca
Dr. M.E. Fraser BI 413 403-220-6145 frasm@ucalgary.ca

Desire 2 Learn (D2L) course name: BCEM 341 L01 - (Winter 2016) - Biochemistry of Life Processes
Biological Sciences Department BI 186; (403) 220-3140; biosci@ucalgary.ca

2. **Prerequisites:** Chemistry 351. 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>)

NOTE: Credit for both Biochemistry 341 and 393 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:

Laboratory work (6 labs x 4% per lab)	24
Quizzes (6 x 1% each)	6%
Midterm examination (2 hr)	35%
Final Examination (2 hr)	35%

There will be a final exam scheduled by the Registrar's office.

A mark of $\geq 58\%$ is the minimal passing grade for the lab component of this course. Attendance at labs is mandatory.

“Each piece of work (quizzes, laboratory work, 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 a failing grade will result if the student does not pass the laboratory work.”

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.3 of the University Calendar
5. **Scheduled out-of-class activities:**

Midterm Exam I: Saturday March 5 1→3 pm EEEL 161

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

6. **Required Text:** Biochemistry: A Short course, Tymoczko, Berg, and Stryer, W. H. Freeman and Company & Sons, 2nd edition.
***Laboratory exercises:** will be uploaded on Desire 2 Learn, along with lecture notes.
7. **Examination Policy:** Non-programmable calculators will be allowed for exams. 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 and on exams will be a factor in the evaluation. See also Section E.2 of the University Calendar.
9. **Human studies statement:** indicating whether students in the course may be expected to participate as subjects or researchers. See also Section E.5 of the University Calendar.

STUDIES IN THE BIOLOGICAL SCIENCES INVOLVE THE USE OF LIVING AND DEAD ORGANISMS. Students are expected to be familiar with <http://www.ucalgary.ca/pubs/calendar/current/sc-5-1.html> of the on-line calendar.

See also <http://www.ucalgary.ca/pubs/calendar/current/e-5.html>.

10. OTHER IMPORTANT INFORMATION FOR STUDENTS:

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.

(a) **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on [assembly points](#).

(b) **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.

(c) **Safewalk:** Campus Security will escort individuals day or night (<http://www.ucalgary.ca/security/safewalk/>). Call 403-220-5333 for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.

(d) **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>.

(e) **Student Union Information:** VP Academic Phone: 403 220-3911 Email: suypaca@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 _____

Associate Dean's Approval for
out of regular class-time activity: _____ Date: _____
C341 co W16; 1/5/2016 2:39 PM

DEPARTMENT OF BIOLOGICAL SCIENCES

COURSE OUTLINE

BIOCHEMISTRY 341

BIOCHEMISTRY OF LIFE PROCESSES

TERM: Winter 2016 SECTION NO: 01

PREREQUISITE(S): Chemistry 351

A student may not register in a course unless he/she has a grade of at least C- in the prerequisite course.

ANTIREQUISITE(S): Credit for both Biochemistry 341 and 393 will not be allowed.

Note: This course will not serve as a prerequisite for advanced chemistry courses or certain biochemistry or cellular, molecular and microbial biology courses.

COURSE COORDINATOR: Dr. E. Lohmeier-Vogel

Instructors: Dr. E. Lohmeier-Vogel BI 039 403-220-8281 lohmeier@ucalgary.ca
Dr. M.E. Fraser BI 413 403-220-6145 frasm@ucalgary.ca

LAB COORDINATOR: Dr. E. Lohmeier-Vogel

LECTURES: MWF 13:00 ST 139

LABS:

01	T	09:30	BI 117
02	T	14:00	BI 117
03	T	18:00	BI 117
05	M	18:00	BI 117

TEXT: Required: Biochemistry: A Short course. Tymoczko, Berg and Stryer. W.H. Freeman and Company & Sons. 3rd Edition.

MARK DISTRIBUTION:

A. Composition of Final Grade

Laboratory work (6 labs x 4% per lab)	24
Quizzes (6 x 1% each)	6%
Midterm examination (2 hr)	35%
Final Examination (2 hr)	35%

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

Laboratory Work \geq 58%

D. Grade Scale

\geq 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

BCEM341 Winter 2016: Tentative Lecture Schedule2

DATE	TOPIC	Instructor	
Jan.	11	Introduction to the Course and Lipids	ELV/ MEF1
	13	Lipids in Membranes	MEF2
	15	Carbohydrates – Monosaccharides	MEF3
	18	Carbohydrates – Linking Monosaccharides	MEF4
	18+19	Lab 1: Lipids	MEF
	20	Amino Acids – Structures and Properties	MEF5
	22	Peptides and Proteins - Peptide Bond and Primary Structure	MEF6
	25	Peptides and Proteins - Secondary Structure	MEF7
	27	Peptides and Proteins - Tertiary and Quaternary Structure	MEF8
	29	Carbohydrates Attached to Proteins and Proteins that Bind Carbohydrates	MEF9
Feb.	1	Membranes, including Membrane Proteins	MEF10
	1+2	Lab 2: Food Chemistry (Proteins and Carbs in Beer)	MEF
	3	Basic Concepts about Enzymes	MEF11
	5	Enzyme Kinetics	MEF12
	8	Enzyme Kinetics – Allosteric Enzymes	MEF13
	10	Enzyme Mechanisms and Inhibitors	MEF14
	12	Classes of Enzymes. Example of a Hydrolase: Chymotrypsin	MEF15
		Reading Week *** No Lectures***	
	22	Example of an Allosteric Protein: Hemoglobin Lab 3:	MEF 16
	22+23	Enzymatic Activity of β-Galactosidase	MEF
	24	Transport across membranes	MEF17
	26	Energetics of enzyme reactions	MEF18
	29	Metabolism (intro) and digestion	ELV1
Mar.	2	Carbohydrate catabolism (overview) and glycolysis 1→5	ELV2
	4	Glycolysis 6→10 and anaerobic metabolism	ELV3
	5	Midterm 1:00-3:00 EEEL 161 (MEF lecture 1-18)	MEF
	7	Regulation of glycolysis	ELV4
	7+8	Lab 4: Protein Precipitation Studies	ELV
	9	Overview of aerobic metabolism, the pyruvate dehydrogenase complex and TCA reactions 1→4	ELV5
	11	TCA reactions 5→8, regulation and oxidative phos (overview)	ELV6
	14	Oxidative phosphorylation (details)	ELV7
	16	ATP synthesis and uncouplers	ELV8
	18	Nucleic acids, the building blocks	ELV9
	21	In-class DNA building exercise	ELV10
	21+22	Lab 5: Aerobic and Anaerobic Metabolism	ELV
	23	RNA structure, DNA packaging	ELV11
	25	Good Friday *** No Lectures***	
	28	DNA polymerase; <i>E. coli</i> DNA replication (start)	ELV12
	30	<i>E. coli</i> replication	ELV13
Apr. 1	1	<i>E. coli</i> transcription (start)	ELV14
	4	<i>E. coli</i> transcription, post-transcriptional modification	ELV15
	4+5	Lab 6: Purification of DNA	ELV
	6	Translation in <i>E. coli</i> , the Genetic code	ELV16
	8	Translation in <i>E. coli</i> , energetics	ELV17
	11	Post-translational modification of proteins	ELV18
	13	Catch-up/review	ELV19

Final Exam Scheduled by the Registrar