UNIVERSITY OF CALGARY

DEPARTMENT OF BIOLOGICAL SCIENCES
COURSE OUTLINE

1. **Course: BCEM 431 – PROTEINS AND PROTEOMICS**

Lecture Sections:	L01:	MWF	10:00-10:50	SB 142	Fall 2016
Course Coordinator:	Dr. Ng				
Instructor(s):	Dr. H. Vogel		BI 423	220-6006	vogel@ucalgary.ca
	Dr. Ng		BI 430B	220-4320	ngk@ucalgary.ca

Desire 2 Learn (D2L) course name: BCEM 431 L01 - (Fall 2016) - Proteins And Proteomics

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

2. **Prerequisites:** Biology 331, Biochemistry 393 and one of Chemistry 353 or 355.
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

Antirequisite(s): Credit for both Biochemistry 431 and 531 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	**50%**
Final Exam	**50%**

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

Each piece of 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.

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. Dates and times of approved class activities:

Midterm Thursday, October 27 6-9 pm Location: ST 135

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

6. **Course Materials:** (recommended) Lehninger Principles of Biochemistry. Nelson and Cox. W.H. Freeman. 6th Ed.

7. **Examination Policy**: Calculators can be used on the midterm examination and the final exam. 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 will be a factor in the evaluation. See also Section E.2 of the University Calendar.

9. 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 of academic misconduct 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 403-220-5333 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 http://www.ucalgary.ca/legalservices/foip.

(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

(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. Recording of lectures is not permitted without permission of the instructor.

(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). 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: ORIGINAL SIGNED Date: _____
C431 F16; 8/18/2016 11:24 AM

Grade Scale
≥86% ➔ A
82 ➔ A-
78 ➔ B+
74 ➔ B
70 ➔ B-
66 ➔ C+
62 ➔ C
58 ➔ C-
54 ➔ D+
50 ➔ D
<50% ➔ F

TENTATIVE SCHEDULE

BCEM 431 Outline - Fall 2016

Introduction to Biochemistry 431; physical chemical basis of protein structure (some review + more advanced concepts)	Sept. 12 (Lecture 1)	KN
Representations of protein structure; basics of working with proteins & structures	Sept. 14 (Lecture 2)	KN
X-ray crystallography	Sept. 16 (Lecture 3)	KN
Cryo-electron microscopy	Sept. 19 (Lecture 4)	KN
Metalloproteins, cofactors, prosthetic groups	Sept. 21, 23, 26, 28 (Lectures 5-8)	HJV
Post-translational modificatons: phosphorylation, lipidation, glycosylation	Sept. 30, Oct. 3, 5, 7 (Lectures 9-12)	HJV
Thanksgiving Day	Oct. 10	No lecture
Protein Modules	Oct. 12 (Lecture 13)	HJV
Introduction to NMR of proteins	Oct. 14, 17 (Lectures 14, 15)	HJV
Mass spectrometry	Oct. 19, 21 (Lectures 16-17)	HJV
Quantitative proteomics	Oct. 24 (Lecture 18)	HJV
Case study / Review: Human serum albumin	Oct. 26 (Lecture 19)	HJV
Midterm Exam (Lectures 1-19)	**Thursday evening, 6-9 PM, Oct. 27**	**HJV/KN**
(Morning after exam)	Oct. 28	No lecture
Protein regulation: proteolysis	Oct. 31 (Lecture 20)	KN
Protein regulation: targeting, pH	Nov. 2 (Lecture 21)	KN
Homology modeling	Nov. 4, 7, 9 (Lecture 22)	KN
Remembrance Day (Mid-term break)	Nov. 11	No lecture
Chemical modifications and cross-linking	Nov. 14, 16, 18 (Lectures 23-25)	KN
Protein folding and unfolding *in vitro*	Nov. 21, 23, 25 (Lectures 26-28)	KN
Protein folding *in vivo*: molecular chaperones; protein folding catalysts	Nov. 28, 30, Dec. 2 (Lectures 29-31)	KN
Protein regulation: quality control	Dec. 5, 7 (Lectures 32, 33)	KN
Review	Dec. 9 (Lecture 34)	KN
Final exam (Focusing on lectures 20-34, but referring to earlier concepts also)	**3 h scheduled by the Registrar's Office**	**KN**