



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

1. **Course: BIOCHEMISTRY 543 - ENZYMOLOGY**

Lecture Sections: L01 MWF 12:00-12:50 TBA WINTER 2018

Course Coordinator/

Instructor: Dr. K. Ng BI 430B 220-4320 ngk@ucalgary.ca

D2L course website: W2018BCEM543L01 - BCEM 543 L01 (Winter 2018) – Enzymology
 Biological Sciences Department BI 186; (403) 220-3140; biosci@ucalgary.ca

2. **Prerequisites:** Biochemistry 393 and 443, and 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>

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 Assignments	20%			
Midterm Exam	40%	March 10, 2018	9:00AM-12 Noon	SB 103
Project Assignments	10%			
Poster session presentation	20%			
Written report	10%			

(There will NOT 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 (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.3](#) of the University Calendar

5. **Scheduled out-of-class activities:** Dates and times of approved class activities held outside of class hours.

Midterm Exam Saturday, March 10, 2018 9:00 am - 12:00 noon SB 103

REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME-ACTIVITY. If you have a clash with this out-of-class-time-activity, please inform your instructor as soon as possible so that alternative arrangements may be made for you.

6. **Course Materials:** TEXT: Recommended: Enzymology – Excerpts from Bugg and Stein (custom eBook). Wiley. 2016. ISBN: 9781119272786

A permanent, non-expiring copy of the custom eBook can be purchased on-line through U of C Bookstore.

Single-user access to the complete texts is also available through eBrary.

Webpage links to the complete Bugg text and Stein text are found on this page:

<http://people.ucalgary.ca/~ngk/bcem543/bcem543.html>

A hard copy of each text is also available at the Reserve Desk at the TFDL

7. **Examination Policy:** No electronic or written aids (eg. cell phones, tablets, computers, PDAs, notes, textbooks) will be allowed during writing of any exams. Non-programmable calculators will be permitted to answer quantitative questions on exams, if applicable, and permission to do this will be clearly indicated on the examination paper. Students should also read the Calendar, Section G, on Examinations.

8. In this course, the quality of the student's writing will be a factor in the evaluation of the student's work. See also <http://www.ucalgary.ca/pubs/calendar/current/e-2.html>.

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.

10. **Human studies statement:** See also [Section E.5](#) 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 fieldwork 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.

Department Approval _____ ORIGINAL SIGNED _____ Date _____

Department Approval
For NO Final Exam: _____ ORIGINAL SIGNED _____ Date: _____
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BCEM 543 Winter 2018 TENTATIVE SCHEDULE (there may be minor changes)

January 8	Binding	
January 10	Binding	
January 12	Binding	
January 15	Catalysis	
January 17	Catalysis	
January 19	In-class assignment 1 (4%)	
January 22	Catalysis	
January 24	Catalysis	
January 26	Catalysis	
January 29	Catalysis case study	
January 31	Catalysis case study	
February 2	In-class assignment 2 (4%)	
February 5	Chemical kinetics	
February 7	Enzyme kinetics	
February 9	Enzyme kinetics	
February 12	Enzyme kinetics	
February 14	Enzyme kinetics	
February 16	In-class assignment 3 (4%)	
February 18-25	READING DAYS -- NO LECTURES	
February 26	Enzyme kinetics	
February 28	Enzyme kinetics	
March 2	Enzyme kinetics case study	
March 5	In-class assignment 4 (4%)	
March 7	Enzyme kinetics case study	
March 9	In-class review	
March 10 – Midterm Exam (9:00 am – 12 noon) (40%)		SB 103
March 12	Enzyme regulation	
March 14	Enzyme regulation	
March 16	Enzyme regulation	
March 19	Enzyme regulation	
March 21	Enzyme regulation	
March 23	In-class assignment 5 (4%)	
March 27	Enzyme applications	
March 29	Enzyme applications	
March 30	GOOD FRIDAY – NO LECTURES	
April 2	Poster Session 1	
April 4	Poster Session 2 (20%)	
April 6	Enzyme applications	
April 9	Enzyme applications	
April 11	Enzyme applications	
April 13	Enzyme applications (Written reports due) (10%)	

Reserve Reading List – BCEM 543 W2018

	*	AUTHOR	TITLE	PUBLISHER/DATE/EDITION	CALL NUMBER
1.	1	Bugg, T.D.H.	Introduction to Enzyme and Coenzyme Chemistry, 3 rd Ed.	John Wiley, 2012 ISBN 9781119995951	QP601.B94 2012
2.	3	Stein, R.L.	Kinetics of Enzyme Action: Essential Principles for Drug Hunters	John Wiley, 2011 ISBN 978-0-470-41411-8	QP601 .S5685 2011
3.	1	Frey, P.A. & Hegeman, A.D.	Enzymatic Reaction Mechanisms	Oxford University Press, 2007 ISBN 9780195122589	QP601.F725 2007
4.	3	Copeland, R.A.	Enzymes: a practical introduction to structure, mechanism, and data analysis	John Wiley, 2000 ISBN: 0471359297	QP601 .C664 2000
5.	3	Cook, P.F. & W.W. Cleland	Enzyme Kinetics and Mechanism	Garland Science, 2007 ISBN 0-8153-4140-7	QP601.3 .C66 2007
6.	3	Creighton, T.E.	Proteins: Structures and Molecular Properties	W.H. Freeman 2 nd Ed. 1993 ISBN 0-7167-2317-4	QP 551.C73 1993
7.	3	Fersht, A.	Structure and Mechanism in Protein Science	W.H. Freeman 1999 ISBN 0-7167-3268-8	QD 431.25.S85 F47 1999
8.	2	Jencks, W.P.	Catalysis in Chemistry and Enzymology	Dover Publications 1969 ISBN 0-486-65460-5	QD 501.J44 1969
9.	2	Copeland, R.A.	Evaluation of enzyme inhibitors in drug discovery : a guide for medicinal chemists and pharmacologists	John Wiley, 2013 ISBN 9781118540404	QD271 .M46 V.46 2005
10.	2	Petsko, G.A. & D. Ringe	Protein Structure and Function	New Science Press 2004 ISBN 0-87893-663-7	QP551 .P44 2004
11.	2	Silverman, R.P.	The Organic Chemistry of Enzyme-Catalyzed Reactions	Academic Press 2002 ISBN 0-12-643731-9	QP601 .S55 2002

*Number of copies on reserve. Electronic access to books 1, 2, 4 and 9 are also available through Ebrary (<http://people.ucalgary.ca/~ngk/bcem543/bcem543.html>).