

Course Description and Goals:

Biochemistry is the study of the molecules of life and centres on four key groups of biomolecules: proteins, lipids, carbohydrates and nucleic acids. Students will learn about the structure and function of these key biomolecules, the mechanics by which the cellular machinery is supplied with energy, and how genetic material is converted to functional information. Students will also learn techniques of recombinant DNA technology that have profoundly changed how we study and use cell functions.

Course Outcomes:

Upon completion of the course students should be able to:

1. Demonstrate basic knowledge about the structure, roles, and functions of the different classes of biomolecules.
2. Provide examples where defects in biochemical processes result in disease, and predict potential outcomes of biochemical defects.
3. Describe the central pathways that provide living organisms with energy, and the regulation of these pathways.
4. Detail information flow in living systems and mechanisms that regulate the expression of genetic material.
5. Formulate an approach to clone and express a gene of interest in bacteria.
6. Obtain and interpret scientific information from literature, databases and oral presentations.

Prerequisites:

Bio 1001A or 1201A, Bio 1002B or 1202B, Chem 1301A/B, and Chem 1302A/B.

Course secretary:

Mrs. Judy Penchuk
Phone and voicemail: (519) 661-3362
Available 9 am – 12 and 1:30 – 2:30 pm Monday to Friday
Email: jpenchuk@uwo.ca
Mail: Department of Biochemistry
Schulich School of Medicine & Dentistry
Western University
London ON, N6A 5C1

Find Mrs. Penchuk on campus:

MBL room C5, shown as Bio Lab on the campus map. We are located between Medical Sciences and the Kresge building.

Course Coordinator:

Dr. Derek McLachlin
Location: MSB 349
Email: derek.mclachlin@schulich.uwo.ca
Phone: 519-661-3072

Course material:

All course material, other than textbook readings and questions, is available through the OWL online course site. Also available in OWL is a set of note summaries for the in-class lectures taught in the fall session of Biochemistry 2280A. Students with OWL issues should see:

<https://owl.uwo.ca/portal/site/owldocs>

Forum:

Your online course contains a student Forum – a discussion group for the course for you to review and ask questions. Student's names will not be visible to other students. TAs or the professor will respond to postings, though all students are also encouraged to contribute to discussions initiated by others. Students should keep their interactions on a friendly basis.

Virtual Office Hours:

From time to time, Dr. McLachlin will hold virtual office hours via the Collaborate tool in OWL. Collaborate allows groups of people to interact via video, audio, or chat messages. Dates and times will be announced as the course progresses. The virtual office hours will be recorded.

Required Textbook:

Essential Cell Biology, Fourth Edition – Bruce Alberts, Dennis Bray, Karen Hopkins, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts and Peter Walter by Garland Publishing Inc.

Evaluation:

Component	Topics	Date	% of Final Mark
Midterm test	1-13	June 24	47
Final exam	14-24	TBA (Jul 31-Aug 3)	47
PeerWise	All*	Various*	6

* See the file "PeerWise Instructions" on OWL for details.

Topics and suggested timeline:

Recommended dates	Topics	Approx. time commitment**
	Section 1	20 hours**
May 8 – 14	Topic 1 Fundamental concepts in Biochemistry	
	Topic 2 Amino Acids	
	Topic 3 Protein Structure	
May 15 - 21	Topic 4 Protein Function & Enzymes	
	Topic 5 Protein Purification & Proteomics	
	Section 2	30 hours**
May 22 - 28	Topic 6 Lipids and Membranes	
	Topic 7 Carbohydrate Structure	
May 29 - Jun 4	Topic 8 Fundamental Concepts in Metabolism	
	Topic 9 Carbohydrate Metabolism	
Jun 5 - 11	Topic 10 Citric Acid cycle	
	Topic 11 Electron transport and ATP synthesis	
Jun 12 - 18	Topic 12 Lipid Metabolism	
	Topic 13 Summary of Metabolic Pathways	
Sat. Jun 24th	Midterm Covers Topics 1 - 13	3-hour exam
	Section 3	10 hours**
Jun 19 - 25	Topic 14 Nucleic Acid Structure	
	Topic 15 DNA Replication	
1st half Jun 26 - Jul 2	Topic 16. DNA Repair	
	Section 4	13 hours**
2nd half Jun 26 - Jul 2	Topic 17 Prokaryotic Transcription	
Jul 3 - 9	Topic 18 Eukaryotic Transcription	
	Topic 19 RNA Processing	
1st half Jul 10 - 16	Topic 20 Translation	
	Section 5	20 hours**
2nd half Jul 10 - 16	Topic 21 Recombinant DNA Technology	
Jul 17 - 23	Topic 22 Cloning Your Favourite Gene	
	Topic 23 Sequencing Genomes	
	Section 6	7 hours**
Jul 24 - 30	Topic 24 Molecular Basis of Cancer	
	Review	
July 31 - Aug 3	Exam period – final covers Topics 14 - 24	3-hour exam

** Approximate time commitments do NOT include time spent on PeerWise, which should be a helpful tool but is not a substitute for thorough, independent review of the course content.

Exams: See http://www.registrar.uwo.ca/applying/distance_studies/examinations.html for information regarding Distance Studies Examinations.

The 3-hour midterm test will cover material in Topics 1 to 13 and will be Saturday, June 24th. The time and location will be announced closer to the day. The 3-hour final exam will cover Topics 14 to 24 and will be scheduled by the Registrar sometime between July 31 and August 3. Check online for the date, time and location.

NB: If you need to change the location of your exam you need to contact the Distance Studies office at least 3 weeks prior to the exam date at 519-661-2111 ext. 84879 or distexam@uwo.ca.

Biochemistry 2280A E-Course exams may include essay/short answer and multiple choice components marked on Scantrons. The course uses software that will detect unusual coincidences in answer patterns that may indicate cheating. We caution students to transfer their answers to their Scantron with care! Adjustment for transposition errors will not be made.

It is each student's responsibility to determine where she/he is to write each examination and to appear at the designated room on time. Students must provide their own pens, pencils (HB) and erasers for the examination.

No student will be allowed to write an examination without either a [Western ONECard](#) student ID or another piece of government-issued photo identification. Electronic devices, including (but not limited to) calculators, cell phones and iPods are NOT allowed in the exam room.

Missed test/examination: "Students who are unable to write a scheduled midterm test must inform their instructor and provide proper documentation to their academic counsellor. IF approval is made for a make-up test and your exam centre is in London, your instructor will arrange the time and location of your rewrite. If you are writing at an off-campus exam centre, you must contact Distance Studies office if your make up test is approved to arrange your rewrite. Students will be required to pay an off-campus make-up exam fee."

Academic Offenses: All students are responsible for reading the list of Academic Rights and Responsibilities at the following website: <http://www.westerncalendar.uwo.ca/2017/pg111.html>. Infractions may result in a grade of zero on the exam in question.

Useful Links

Office of the Registrar – Distance Studies

http://www.registrar.uwo.ca/applying/distance_studies/index.html

Academic Counselling (Science and Basic Medical Sciences):

http://www.uwo.ca/sci/undergrad/academic_counselling/index.html

Student Center: <https://student.uwo.ca/psp/heprdweb/?cmd=login>

Student Development Centre: <http://www.sdc.uwo.ca/>

Student Health Services: <http://www.health.uwo.ca/>

Students who are in emotional/mental distress should refer to Mental Health@Western

<http://www.uwo.ca/uwocom/mentalhealth/> for a complete list of options about how to obtain help.