

Course Outline

1. COURSE INFORMATION			
Session Offered	Fall 2015		
Course Name	Cell Biology		
Course Code	BIOTECH 2CB3		
Date(s) and Time(s) of lectures	Lectures - Mondays: 09:30-10:20; Thursdays: 15:30-17:20 Labs - Mondays: 16:30-19:20 for L01 & L02 (EOW); 11:30-14:20 for L03 (EOW)		
Program Name	Biotechnology		
Calendar Description	An introduction to the basic living cell structure, functions, genetics and the fundamentals of metabolism.		
Instructor(s)	Lectures: Dr. Rashid Abu-Ghazalah abughar@mcmaster.ca Labs: Ms. Nazia Pathan pathann@mcmaster.ca	Office Hours & Location: Mondays: 13:30-15:30 in ETB 217 Alternatively, use email to schedule appointments for other times.	
2. COURSE SPECIFICS			
Course Description	This course will cover the structure and function of cells as well as exploring the differentiating factors of prokaryotic and eukaryotic cells; acellular organisms such as viruses, viroids; and prions. The course will discuss thermodynamic laws, the concepts of entropy and free energy along with the function of enzymes as biological catalysts and their role in cellular metabolism. The structure and role of membranes in cell life and the role of lipids and proteins and the movement of molecules across membranes will be explored. The biological activities of the cell such as movement, reproduction, and metabolism, along with the nucleus structure, function, and control of cellular activities will be linked.		
Instruction Type	Code	Type	Hours per term
	C	Classroom instruction	38
	L	Laboratory, workshop or fieldwork	18
	T	Tutorial	
	DE	Distance education	
		Total Hours	56
Resources	ISBN	Textbook Title & Edition	Author & Publisher
	ISBN: 978-0470483374	Cell and Molecular Biology: Concepts and Experiments, 7 th Edition	Gerald Karp John Wiley & Sons, Inc.
	Other Supplies	avenue.mcmaster.ca	
Prerequisite(s)	ENGTECH 1BI3, ENGTECH 1CH3		
Corequisite(s)			
Antirequisite(s)			
Course Specific Policies	The attendance of lectures is strongly encouraged and there are many non-announced quizzes. Students should attend all laboratory sessions and submit lab report. Absence from lab with no well documented excuse or failure to		

	<p>submit the report in time result with F grade in that lab. There is no make-up policy in the midterms for this course. If the student missed any midterm then the percentage of the final will be increased to compensate the missing midterms if the student has well documented and approved report for the absence (See MSAF information below). Students should be aware that, when they access the electronic components of this course, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in this course will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure please discuss this with the course instructor. The instructor may also use other software including: e-mail, Avenue, LearnLink, web pages, capa, Moodle, Thinking Cap, etc. The communications via email strictly is by official McMaster University Account, no reply to the commercial emails and/or nick names. Late submissions of assignments and Lab report will be penalized 10% per day. Students must pass both components of the course – labs and lectures to pass the course.</p>	
Departmental Policies	<p>Students must maintain a GPA of 3.5/12 to continue in the program.</p> <p>In order to achieve the required learning objectives, on average, B.Tech. students can expect to do at least 3 hours of “out-of-class” work for every scheduled hour in class. “Out-of-class” work includes reading, research, assignments and preparation for tests and examinations.</p> <p>Where group work is indicated in the course outline, such collaborative work is mandatory.</p> <p>The use of cell phones, iPods, laptops and other personal electronic devices are prohibited from the classroom during the class time, unless the instructor makes an explicit exception.</p> <p>Announcements made in class or placed on Avenue are considered to have been communicated to all students including those individuals that are not in class.</p> <p>Instructor has the right to submit work to software to identify plagiarism.</p>	
3. SUB TOPIC(S)		
Week 1	Review: Introduction to Cell and Molecular Biology	Ch.1
Week 2	Review: The Chemical Basis of Life	Ch.2
Week 3	Bioenergetics, Enzymes, and Metabolism	Ch.3
Week 4	The Structure and Function of Plasma Membranes	Ch.4
Week 5	The Structure and Function of Plasma Membranes Term test 1	Ch.4
<i>Mid-term recess (Monday, October 12 to Saturday, October 17)</i>		
Week 6	Aerobic Respiration and the Mitochondrion	Ch.5
Week 7	Aerobic Respiration and the Mitochondrion	Ch.5
Week 8	Photosynthesis and the Chloroplast	Ch.6
Week 9	Interactions Between Cells and their Environment	Ch.7
Week 10	Cytoplasmic Membrane Systems Term test 2	Ch.8
Week 11	Cytoplasmic Membrane Systems	Ch.8
Week 12	The Cytoskeleton and Cell Motility	Ch.9
Week 13	The Cytoskeleton and Cell Motility	Ch.9
Classes end – Tuesday December 8, 2015		
Final examination period: Wednesday December, 9, 2015 to Tuesday, December 22, 2015		

All examinations MUST BE written during the scheduled examination period.

List of experiments

Lab 1	Cell Culture
Lab 2	Analysis of Cell Structure
Lab 3	Isolation of Cell Organelles (<i>Mid-term recess falls between L01 and L02</i>)
Lab 4	Quantitative Cell Migration Assay and Immunofluorescent Analysis
Lab 5	Succinate Dehydrogenase Activity in Cauliflower Mitochondrion

Note that this structure represents a plan and is subject to adjustment term by term.

The instructor and the University reserve the right to modify elements of the course during the term. The University may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes.

4. ASSESSMENT OF LEARNING *including dates*	Weight
Assignments/Quizzes	10
Mid-term test	30
Labs	25
Final examination (tests cumulative knowledge)	35
TOTAL	100%

Percentage grades will be converted to letter grades and grade points per the University calendar.

5. LEARNING OUTCOMES

1. Explain the cell concept which is the basic unit of life as compared to acellular or non cellular organisms; differentiate between the two major type of cells namely prokaryotic and eukaryotic.
2. Describe the differences between various structures of the cell and their function and how they interfere with their surrounding environment and performing their biological activity and the energy flow in the cell.
3. Know how the living cell performs the various biological activities such as metabolism, reproduction, respiration, and how the cells communicate with each other.
4. Apply cell biology laboratory techniques in the examination, recognition and classification of different cells and their organelles.
5. Employ the understanding of biological thermodynamics in the determination of structure of macromolecules and hence their activities.
6. Create links between macromolecular structure and their levels of expression in subcellular components and the latter's activities.
7. Understand the concept of the cytoskeleton as a structural motif that physically holds the cell together and how it allows the machinery of the cell to function.

6. POLICIES

Anti-Discrimination

The Faculty of Engineering is concerned with ensuring an environment that is free of all discrimination. If there is a problem, individuals are reminded that they should contact the Department Chair, the Sexual Harassment Officer or the Human Rights Consultant, as soon as possible.

<http://www.mcmaster.ca/policy/General/HR/Anti-Discrimination%20policy.pdf>

Academic Integrity

You are required to exhibit honestly and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity.

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various kinds of academic dishonesty please refer to the Academic Integrity Policy, located at: <http://www.mcmaster.ca/policy/Students-AcademicStudies/AcademicIntegrity.pdf> .

The following illustrates only three forms of academic dishonesty:

1. Plagiarism. E.g. the submission of work that is not own or for which other credit has been obtained
2. Improper collaboration in group work
3. Copying or using unauthorized aids in tests and examinations.

Requests for Relief for Missed Academic Term Work (Assignments, Mid-Terms, etc.)

The McMaster Student Absence Form is a self-reporting tool for **Undergraduate Students** to report absences that last up to 3 days and provides the ability to request accommodation for any missed academic work. Please note, this tool cannot be used during any final examination period.

You may submit a maximum of 1 Academic Work Missed requests per term. It is YOUR responsibility to follow up with your Instructor immediately regarding the nature of the accommodation.

If you are absent more than 3 days or exceed 1 request per term you MUST visit your Associate Dean's Office (Faculty Office). You may be required to provide supporting documentation.

This form should be filled out immediately when you are about to return to class after your absence. <http://www.mcmaster.ca/msaf/>

E-Learning Policy

Consistent with the Bachelor of Technology's policy to utilize e-learning as a complement to traditional classroom instruction, students are expected to obtain appropriate passwords and accounts to access Avenue To Learn for this course. Materials will be posted by class for student download. It is expected that students will avail themselves of these materials prior to class. Students should be aware that, when they access the electronic components of this course, private information such as first and last names, user names for the McMaster e-mail account, and program affiliation may become apparent to all other students in the course. The available information is dependent on the technology used. Continuation in this course will be deemed consent to this disclosure. If you have any questions or concerns about this disclosure please discuss this with the course instructor. Avenue can be accessed via <http://avenue.mcmaster.ca>.

Communications

It is the student's responsibility to:

- Maintain current contact information with the University, including address, phone numbers, and emergency contact information.
- Use the University provided e-mail address or maintain a valid forwarding e-mail address.
- Regularly check the official University communications channels. Official University communications are considered received if sent by postal mail, by fax, or by e-mail to the student's designated primary e-mail account via their @mcmaster.ca alias.
- Accept that forwarded e-mails may be lost and that e-mail is considered received if sent via the student's @mcmaster.ca alias.
- Check the McMaster/Avenue email and course websites on a regular basis during the term.

Turnitin (Optional)

This course will be using a web-based service (Turnitin.com) to reveal plagiarism. Students submit their assignment/work electronically to Turnitin.com where it is checked against the internet, published works and Turnitin's database for similar or identical work. If Turnitin finds similar or identical work that has not been properly cited, a report is sent to the instructor showing the student's work and the original source. The instructor reviews what Turnitin has found and then determines if he/she thinks there is a problem with the work. Students who do not wish to submit their work to Turnitin.com must still submit a copy to the instructor. No penalty will be assigned to a student who does not submit work to Turnitin.com. All submitted work is subject to normal verification that standards of academic integrity have been upheld (e.g., on-line search, etc.). To see the Turnitin.com Policy, please go to <http://www.mcmaster.ca/academicintegrity/turnitin/students/>

Protection of Privacy Act (FIPPA)

The Freedom of Information and Protection of Privacy Act (FIPPA) applies to universities. Instructors should take care to protect student names, student numbers, grades and all other personal information at all times. For example, the submission and return of assignments and posting of grades must be done in a manner that ensures confidentiality.

<http://www.mcmaster.ca/univsec/fippa/fippa.cfm>

Academic Accommodation of Students with Disabilities Policy

Students who require academic accommodation must contact Student Accessibility Services (SAS) to make arrangements with a Program Coordinator. Academic accommodations must be arranged for each term of study. Student Accessibility Services can be contacted by phone 905-525-9140 ext. 28652 or e-mail sas@mcmaster.ca. For further information consult McMaster's policy for Academic Accommodation of Students with Disabilities

<http://www.mcmaster.ca/policy/Students-AcademicStudies/AcademicAccommodation-StudentsWithDisabilities.pdf>

Students must forward a copy of the SAS accommodation to the instructor of each course and to the Program Administrator of the B.Tech. Program immediately upon receipt. If a student with a disability chooses NOT to take advantage of a SAS accommodation and chooses to sit for a regular exam, a petition for relief may not be filed after the examination is complete. <http://sas.mcmaster.ca>

Student Code of Conduct

The Student Code of Conduct (SCC) exists to promote the safety and security of all the students in the McMaster community and to encourage respect for others, their property and the laws of the land. McMaster University is a community which values mutual respect for the rights, responsibilities, dignity and well-being of others. The purpose of the Student Code of Conduct is to outline accepted standards of behavior that are harmonious with the goals and the well-being of the University community, and to define the procedures to be followed when students fail to meet the accepted standards of behavior. All students have the responsibility to familiarize themselves with the University regulations and the conduct expected of them while studying at McMaster University.

<http://judicialaffairs.mcmaster.ca/pdf/SCC.pdf>