

Summer 2008

**BIOLOGY 1A03**  
**CELLULAR AND MOLECULAR BIOLOGY**

**PROFESSORS**

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**COURSE DESCRIPTION**

Structure, molecular composition, and function in sub-cellular and cellular systems.

**Prerequisites**

Grade 12 Biology U and registration in one of Science I, Arts & Science I, Kinesiology I, Mathematics and Statistics I, Medical Radiation Sciences I, Chemical Engineering and Bioengineering, Electrical and Biomedical Engineering, any programme above Level I; or a grade of at least 80% in Grade 12 Biology U. Registration in or completion of CHEM 1A03, 1AA3, is strongly recommended. CHEM 1A03, 1AA3 are prerequisites for many Biology courses in Level II, III, and IV.

**Corequisite SCIENCE 1A00**

Students registering in Biology 1A03 must also register in Science 1A00 when completing their registration.

All Biology 1A03 students must have completed the Science 1A00 Safety Workshop in order to participate in the 1A03 labs. The Science 1A00 Safety Workshop will be held on campus. The date, time, and location will be posted on the Biology 1A03 WebCT website and announced in lectures. Bring your McMaster Student I.D. card, an HB pencil, and an eraser for the quiz.

**BIOLOGY 1A03 COURSE GOALS & OBJECTIVES**

The Biology 1A03 course is designed for students who intend to specialize in Science programs and is required for many higher level courses in the Faculty of Science. Upon completion of Biology 1A03, students will be able to:

1. Effectively discuss the fundamental concepts and underlying processes related to cellular and molecular biology.
2. Implement laboratory technical skills necessary for biological sciences.
3. Work independently and in collaboration with others to compile, analyze, interpret, and present scientific data using oral, written, and internet formats.

The primary goal of the course is to prepare students academically for subsequent, specialized Biology courses and to ensure that students acquire skills essential for upper-level biology courses and biology-related fields of study.

## **BIOLOGY 1A03 LECTURES**

Lectures will be held on Monday and Wednesday mornings [9:00 am - 12:00 (noon)] in the Togo Salmon Hall in Lecture Hall B105.

The 1A03 lectures will be a synthesis of several sources (the textbook, primary scientific literature, such as journal articles and current research). Lecture Outlines, Lists of Overheads, Study Questions, and Supplementary Resources will be posted on the Biology 1A03 WebCT/Blackboard site.

The Biology 1A03 WebCT/Blackboard Lecture Outlines are not detailed lecture notes. Students are expected to attend all lectures and supplement the posted Biology 1A03 WebCT/Blackboard postings with their own written "in-class" lecture notes.

Tests and the Final Exam will include some concepts and current experimental work, which are not discussed in your textbook. These topics will be discussed exclusively during lectures. The use of new material will demonstrate how the concepts covered in Biology 1A03 lead directly to recent work and to applied research.

No part of the lecture presentations or in-class discussions may be reproduced, in any form or by any means, without permission in writing from the professors. No visual media (overheads, Powerpoint, MP3 media) may be reproduced or communicated by any means. Usage of cameras or video / camera-capable cell phones are not permitted to be used during lectures.

## **BIOLOGY 1A03 LABS**

Labs will be held on Tuesdays (9:00 am-12 noon) in Burke Science Building (BSB) 2<sup>nd</sup> floor laboratories, rooms 213, 214, 217, & 218.

Skills Labs run on Tuesday June 24<sup>th</sup> 9:00 am - 4:30 pm, Monday June 30<sup>th</sup>, and Wednesday July 2<sup>nd</sup> 12:30-4:30 pm.

Regular Labs start on Tuesday, July 8<sup>th</sup>. Detailed schedules will be announced in lectures and posted in the Biology 1A03 WebCT/Blackboard site.

The Lab Test will be held during the scheduled lab time on Tuesday July 29<sup>th</sup>.

## **EXEMPTION FROM THE LAB COMPONENT**

Students with previous lab credit in Biology 1A03 may apply for an exemption from the lab component in Biology 1A03. Note that exemptions are NOT automatic. Forms to apply for the exemption are available on WebCT or from the Instructional Assistant's office in BSB 201A. Forms must be submitted to the Instructional Assistant's office by 4:00 pm on Friday June 27<sup>th</sup>. If exemption is not approved, students must complete ALL of the 1A03 labs. Lab exemption does not include exemptions from the newspaper article assignment.

## **REQUIRED BIOLOGY 1A03 TEXTBOOK**

BIOLOGICAL SCIENCE, 2<sup>nd</sup> Edition (Volume 1, The Cell, Genetics, and Development) by Scott Freeman.

## **REQUIRED WRITING GUIDE**

A Short Guide to Writing About Biology (6<sup>th</sup> Edition) by J. A. Pechenik (bundled with the textbook).

This is an excellent reference book, which is useful for completing the Biology Newspaper Article assignment and Formal Lab report.

## **REQUIRED BIOLOGY 1A03 LABORATORY NOTEBOOK**

The Biology 1A03 Lab Notebooks are available for purchase at Titles (McMaster's Main Bookstore).

The Biology 1A03 Lab Manual will be available for students to download and print from the 1A03 WebCT/Blackboard site.

**REQUIRED LAB SUPPLIES**

A lab coat, pens, pencils, erasers, metric rulers, and McMaster-approved calculator may be purchased at Titles (McMaster's Main Bookstore).

**OPTIONAL TEXTBOOK STUDY GUIDE**

The Study Guide by Warren Burggren for Scott Freeman's Biological Science (2<sup>nd</sup> Ed) textbook is considered an optional resource. The Study Guide is highly recommended since it contains summaries and practice questions related to the textbook information.

**TENTATIVE BIOLOGY 1A03 LECTURE SCHEDULE**

<b><u>DATE:</u></b>	<b><u>ASSIGNED TEXTBOOK CHAPTERS</u></b> <b><u>BIOLOGICAL SCIENCE, 2<sup>nd</sup> Edition</u></b> <b><u>Volume 1 – The Cell, Genetics, &amp; Development by Scott Freeman</u></b>	
<b>Mon., June 23<sup>rd</sup></b>	<b><u>Chapter 2</u></b>	The Atoms and Molecules of Ancient Earth <i>(Chp. 2 is considered assumed knowledge obtained from high school Biology U levels)</i>
	<b><u>Chapter 3</u></b>	Protein Structure and Function
	<b><u>Chapter 4</u></b>	Nucleic Acids and the RNA World
<b>Wed., June 25<sup>th</sup></b>	<b><u>Chapter 5</u></b>	An Introduction to Carbohydrates
	<b><u>Chapter 6</u></b>	Lipids, Membranes, and the First Cells
<b>Mon., June 30<sup>h</sup></b>	<b><u>Chapter 7</u></b>	Inside the Cell
	<b><u>Chapter 11</u></b>	The Cell Cycle
<b>Wed., July 2<sup>nd</sup></b>	<b><u>Chapter 11</u></b>	The Cell Cycle <i>(continued)</i>
<b>Mon., July 7<sup>th</sup></b>	<b><u>Chapter 12</u></b>	Meiosis
<b>Wed., July 9<sup>th</sup></b>	<b><u>Chapter 12</u></b>	Meiosis <i>(continued)</i>
<b>Mon., July 14<sup>th</sup></b>	<b><u>Chapter 13</u></b>	Mendel and the Gene
<b>Wed., July 16<sup>th</sup></b>	<b><u>MIDTERM TEST</u></b> (worth 30%, covers Chapters 3, 4, 5, 6, 7, 11, 12 lectures, WebCT /Blackboard postings, in-class discussions, and supplementary information).	
	<b><u>Chapter 14</u></b>	DNA Synthesis
<b>Mon., July 21<sup>st</sup></b>	<b><u>Chapter 15</u></b>	How Genes Work
<b>Wed., July 23<sup>rd</sup></b>	<b><u>Chapter 16</u></b>	Transcription and Translation
<b>Mon., July 28<sup>th</sup></b>	<b><u>Chapter 17</u></b>	Control of Gene Expression in Bacteria
<b>Wed., July 30<sup>th</sup></b>	<b><u>Chapter 19</u></b>	Analyzing and Engineering Genes*
	<b><u>Chapter 20</u></b>	Genomics *
<b>Mon., Aug 4<sup>th</sup></b>	<b><u>NO LECTURE</u> CIVIC HOLIDAY</b>	
<b>Wed., Aug 6<sup>th</sup></b>	<b><u>FINAL EXAM</u></b> (worth 40%, covers all assigned textbook chapters 3, 4, 5, 6, 7, 11, 12, with emphasis on 13, 14, 15, 16, 17, 19, 20, lectures, in-class discussions, WebCT/Blackboard postings, & supplementary resources)	

\* Selected topics from these chapters will be covered. Details will be posted on the Biology 1A03 WebCT/Blackboard site.

## **HOW TO LOG INTO THE BIOLOGY 1A03 WebCT/BLACKBOARD SITE**

1. Start your web browser and go to: <http://www.ltrc.mcmaster.ca/webct/index.shtml>
2. **USER ID:**  
Type in the first part (in lower case letters) of your McMaster MUSS e-mail address.  
  
For example: if your McMaster e-mail address is janedoe@muss.cis.mcmaster.ca, then your WebCT User ID is janedoe.
3. **PASSWORD:** Type in your McMaster Modem / Printing / CIS Lab Access /Proxy Services password.
4. Then click on the Login button.

You will need Adobe Acrobat Reader (this is freeware) to read the Biology 1A03 *pdf* files. Most computers have Adobe Acrobat Reader installed as standard software. If your computer does not have it, you may download it from the Adobe website:

<http://www.adobe.com/products/acrobat/readstep2.html>

## **BIOLOGY 1A03 POLICIES**

1. It is the responsibility of the student to attend the lecture and lab sections to which he or she has been assigned. If a lab or a lecture is missed, students are responsible for the covered material. Permanent changes from the assigned sections may be made through SOLAR by the first lab. After that, no further changes are possible.
2. It is the responsibility of the student to attend all labs as scheduled. There are no "make-up" labs during the Spring/Summer terms. A missed lab will result in a grade of zero unless the student's absence is supported by the Associate Dean's (Studies) office. Documentation of the reason for the absence will be required by the Associate Dean's office.

Biology 1A03 requires the submission of one formal lab report during the term. If a student misses Lab 3, Microbiology, then Lab 4, DNA Restriction and Electrophoresis, must be submitted in the formal report format. In order to be given a passing grade in Biology 1A03, at least 2 of the 3 regular labs must have been completed. Note: exceptions will be made in the case of labs missed because of illness with the support of the student's Associate Dean of Studies.

If two or more labs are missed, with the support of the Associate Dean's office, the student becomes ineligible to write the Lab Test at the end of the term. In this case, the 10% assigned for the Lab Test will be added to the weighting of the final exam.

In addition to the Biology Statement on Academic Dishonesty, it is the policy of Biology 1A03 that all data collected in the laboratory be handed in with the lab report. Furthermore, data must be written in ink and signed by the Lab Teaching Assistant. A mark of zero will be assigned if the data are not attached.

A laboratory notebook will be kept as a complete record of a student's activities in the Biology 1A03 labs. It will be the primary resource allowed to students in the Lab Test at the end of the term.

A lab coat is required for admission to the labs in Biology 1A03. Without a lab coat, students will not be allowed to enter the lab room.

3. By using the Drop Box system in place for Biology 1A03, the student takes full responsibility to ensure that the assignment or lab be dropped into the correct box by the deadline, which is 12:30 in the afternoon on the day in which it is due. If an assignment or lab is late or submitted to the wrong box, students will receive a 10% per day penalty that will accrue until the assignment or lab is located. Drop boxes are located outside BSB room 201.

A late lab should be submitted to the Instructional Assistant during office hours to acquire a date/time stamp to avoid larger late penalties.

4. Due to the compressed nature of the Spring/Summer term. It is not possible to do “make-up” tests. If a student misses a test for a valid reason, he or she must see their Associate Dean of their respective Faculty to file a missed work form. The Associate Dean's office will require documentation.

A McMaster University Student Medical Certificate is the only medical form acceptable as documentation for special consideration caused by illness. Back dated medical certificates will not be accepted.

All formal documentation from the Associate Dean's Office must be received by the Instructional Assistants.

With valid documentation, a missed test's percent worth will be added to the percent worth of the Final Exam.

Without valid documentation, a missed test will be given a mark of zero.

No discretionary missed work notes will be granted by the professors or the instructional assistant.

5. Only use of the McMaster University approved calculator (*Casio fx 991*) is allowed during evaluations (the Tests and the Final Exam).
6. Any term mark corrections must be made before the Biology 1A03 Final Exam is written.
7. Any marked term work (labs, tests, etc.) may be submitted for re-grading within 5 business days of the work being returned to the student. The work must be accompanied by a re-grade request form printed from the Biology 1A03 WebCT/Blackboard site and the reason for the regrade request must be completely justified on the form. Regrade requests made for frivolous reasons will be denied. Regrade forms and course work should be submitted to the Instructional Assistant's office.
8. All tests, lab reports, and assignments should be completed and submitted individually unless other instructions to work in groups is specifically defined. All reports and assignments, which are submitted must be unique. It is considered academic dishonesty to submit work that is not originally yours or that has been previously submitted. All cases of academic dishonesty will be dealt with through the office of Academic Integrity at McMaster University.

### **BIOLOGY 1A03 TESTS AND FINAL EXAMINATION FORMAT**

The Biology 1A03 Test and the Final Exam may include multiple choice, figures, graphs, and written factual, conceptual, and application style questions.

**GRADING:** Final 1A03 grades will be determined by the following evaluations:

	<u>Date</u>	<u>Value</u>
<b>MIDTERM TEST</b>	Wednesday, July 16 <sup>th</sup> (in class)	<b>30%</b>
<b>LAB TEST</b>	Tuesday, July 29 <sup>th</sup> (9:30-10:30 am)	<b>10%</b>
<b>LABS</b>		
Skills labs	June 24 <sup>th</sup> , 30 <sup>th</sup> , July 2 <sup>nd</sup>	<b>3%</b>
Prelabs	Throughout the semester	<b>3%</b>
Informal labs	Throughout the semester	<b>4%</b>
Formal lab	Due date Friday July 25 <sup>th</sup> by 12:30pm	<b>5%</b>
Lab notebook	Throughout the semester	<b>2%</b>
<b>Biology Newspaper Article Assignment</b>		<b>2.5%</b>
(Due date Monday July 14 <sup>th</sup> in BSB Drop boxes)		
<b>Participation</b> (surveys and feedback)		<b>0.5%</b>
<b>Final Exam</b>	Wednesday, August 6 <sup>th</sup> (in class)	<b>40%</b>

Final marks for the course are based on a total assessment of each student's record.

It is a student's responsibility to make sure that his/her marks are complete and correct.

Grade adjustment techniques may be used. The Professors and the Instructional Assistants reserve the right to change or revise information contained in this course outline.

## **McMASTER UNIVERSITY GRADING SCHEME**

Grades obtained for Biology 1A03 will be converted according to the following scheme, which is the one in general use at McMaster University.

90-100%	A+	12
85-89%	A	11
80-84%	A-	10
77-79%	B+	9
73-76%	B	8
70-72%	B-	7
67-69%	C+	6
63-66%	C	5
60-62%	C-	4
57-59%	D+	3
53-56%	D	2
50-52%	D-	1
0-49%	F	0

## **STUDY SKILLS**

The academic transition from high school to university is often very challenging for many students. For students who wish to improve their academic skills, study habits, time management, or for students who require specialized services [learning challenged students and ESL (English as a second language students)], assistance is available at the Centre for Student Development located in the lower level (basement) of the McMaster University Student Centre in UB 107.

## **MISSED FINAL EXAM**

Students who miss the Biology 1A03 Final Exam for a valid reason may apply to the Associate Dean of their respective faculty for permission to write a Deferred Final Exam to be written during the Deferred Final Exam period. The student must submit a completed McMaster University Medical Certificate and the completed application for the deferred Final Exam to the Office of the Associate Dean within one week of the Final Examination period.

## **ACADEMIC DISHONESTY**

In order to uphold the integrity of the Department of Biology at McMaster University, please consult the Statement on Academic Ethics and the Senate Resolutions on Academic Dishonesty stipulated in the Senate Policy Statements, presented at registration in the Senate Office, and also accessible on the web, <http://www.mcmaster.ca/univsec/policy/AcademicIntegrity.pdf>

Any student who infringes one of these resolutions will be treated according to published policy. A copy of the Biology Department Statement on Academic Dishonesty is printed in the Biology 1A03 Lab Manual, and is also posted in the lab rooms. To deter acts of academic dishonesty in Biology 1A03, there will be multiple versions of tests and final exams. In addition, marked student course work will be randomly scanned and photocopied.