



MBG*4270 DNA Replication, Recombination and Repair

W19

Winter 2019

Section(s): C01

Department of Molecular and Cellular Biology

Credit Weight: 0.50

Version 1.00 - December 17, 2018

1 Course Details

1.1 Calendar Description

This course will examine the DNA transactions that determine the structure and function of the genome, with an emphasis on natural and synthetic mutagens and their mode of action, replication and recombination of genetic material, recognition and repair of DNA damage, and inherited and somatic genetic diseases arising from abnormal DNA metabolism.

Pre-Requisite(s): MCB*2050

1.2 Course Description

This course will examine the DNA transactions that determine the structure and function of the genetic material with an emphasis on natural and synthetic mutagens and their mode of action, replication and recombination of genetic material and the recognition and repair of DNA damage

1.3 Timetable

Monday, Wednesday and Friday, 1:30-2:20 PM in Room CRSC116. *Check WebAdvisor for newest information.

1.4 Final Exam

Exam time and location is subject to change. Please see WebAdvisor for the latest information.

2 Instructional Support

2.1 Instructional Support Team

Instructor:	Mark Baker
Email:	mdbaker@uoguelph.ca
Telephone:	+1-519-824-4120 x54788
Office:	SC1 4453
Office Hours:	Office hours to be announced in class

3 Learning Resources

Textbooks:

There is no formal text assigned for this course. Lectures are based on information presented in class, and in papers and review articles assigned in class. You may access supplementary information from several sources on your own, both in the library and on-line (ie., PubMed)

Texts that may serve as references for some material presented in class are,

1. Watson, J.D. *et al.* 2004. Molecular Biology of the Gene. Cold Spring Harbor Laboratory.
2. Friedberg, E.C. *et al.* 2006. DNA repair and mutagenesis. ASM Press
3. Snustad, D.P. 6th or 7th edition. Principles of Genetics. John Wiley & Sons

Copies of each of these books are on reserve at the main library.

4 Learning Outcomes

4.1 Course Learning Outcomes

By the end of this course, you should be able to:

1. By the end of this course, students should be able to:

1. Understand and describe DNA structure and function
2. Understand and describe DNA replication
3. Understand and explain genetic mutations and how they contribute to changes in phenotype
4. Understand and explain DNA repair and recombination mechanisms
5. Understand the basic principles of DNA damage sensing and damage signaling

5 Teaching and Learning Activities

Lectures

A provisional schedule of lecture topics can be found below. Material given in the lectures is the responsibility of the student. Students are expected to attend all lectures. If you miss a lecture, you should get the notes from another student in the course. Electronic recording of classes is expressly forbidden without prior consent of the instructor. When recordings are permitted, they are solely for the use of the authorized students and may not be reproduced or transmitted to others without the written consent of the instructor.

5.1 Lecture

Topic(s):	Lecture	Date	Lecture Topic
	1-4	Mon. Jan. 7-Mon. Jan. 14	DNA structure and function
	5-11	Wed. Jan. 16- Wed. Jan. 30	Replication of DNA and chromosomes
	12-18	Fri. Feb. 1- Fri. Feb. 15	Mutation

	Mon. Feb. 18-Fri. Feb. 22	Winter break, 2018
19-26	Mon. Feb. 25- Wed. Mar. 13	Genetic recombination
27-33	Fri. Mar. 15- Fri. Mar. 29	DNA damage repair
34-36	Mon. Apr. 1-Fri. Apr. 5	DNA damage sensing

6 Assessments

Description of Assessment

Assignments:

The **critical writing** assignment provides the opportunity for the student to display critical writing skills on a topic related to material covered in lecture. Normally, a paper will be selected from the literature and the student will be asked to summarize the main findings of the paper and answer relevant questions about the material, all within a two-page limit. The exercise is designed to develop good judgment, effective writing and editing skills and the ability to develop ideas and concepts effectively within a limited amount of space.

The **critical thinking** assignment provides the student with the opportunity to critically evaluate and answer questions on a research-related topic relevant to material covered in lecture. The exercise develops ideas that go beyond the simple rote memorization of information presented in class.

Both assignments will be instructor-evaluated.

Midterm Examination:

This exam will test you based on lectures 1-18. Lecture topics that will be covered in this examination are DNA structure and function, Replication of DNA and chromosomes, and Mutation.

The format of this exam will be multiple choice and short answer.

Final exam:

Held during the final exam period. This will be cumulative and you will be assessed on your understanding of all lecture material presented to you in this course. The format of this exam will be multiple choice and short answer.

Important Dates

- **Lectures:** January 7-April 5
- **Assignment:** Due dates: Critical Writing (Feb. 8), Critical Thinking (Mar. 22)
- **Midterm Exam:** *In-class* on Friday, March 1
- **Midterm Break:** February 18-22
- **Last Day of Classes:** Fri Apr 5
- **Final Exam:** TBA

Course & University Policies

Midterm Exam Conflict

A midterm exam conflict is defined as a previously-scheduled academic commitment, such as a lab, class or exam, at exactly the same time as the midterm exam. If you have a conflict, please inform **Dr. Mark Baker** by email, no later than **Monday January 14, 2019** stating the nature of the conflict. For those students who miss the midterm exam because of medical or compassionate reasons, they must provide **Dr. Mark Baker** (SSC 4453) with

appropriate written documentation (from medical services, their medical Dr. or their academic counselor) **before the last day of classes (Apr 5)**. If acceptable documentation is received, the student's mark will be calculated as follows:

Form of Assessment	Weighting
Midterm not written (acceptable documentation provided)	N/A
Assignment Grade	30%
Final Examination	70%

If you do not hand in either of the assignments on the arranged due dates, a penalty of 10% will be deducted for each day the assignment is late. If you do not hand in the assignment at all, a zero score will apply for that missed portion of the course. NOTE: there are no waivers (medical or otherwise) permitted for failing to hand in class assignments.

Academic Consideration: [Undergraduate Calendar](#)

6.1 Marking Schemes & Distributions

Assessment	Value (% of grade)	Date	Learning Outcome	Course activity
Midterm	30%	Mar. 1	1-3	Lecture
Assignment-Writing	15%	Feb. 8	4	Lecture/Sci. Lit.
Assignment-Thinking	15%	Mar. 22	2	Lecture/Sci. Lit.
Final Exam	40%	TBA	1-6	Lecture

7 Department of Molecular and Cellular Biology

Statements

7.1 Academic Advisors

If you are concerned about any aspect of your academic program:

- Make an appointment with a program counsellor in your degree program. [B.Sc. Academic Advising](#) or [Program Counsellors](#)

7.2 Academic Support

If you are struggling to succeed academically:

- Learning Commons: There are numerous academic resources offered by the Learning Commons including, Supported Learning Groups for a variety of courses, workshops related to time management, taking multiple choice exams, and general study skills. You can also set up individualized appointments with a learning specialist. <http://www.learningcommons.uoguelph.ca/>
- Science Commons: Located in the library, the Science Commons provides support for physics, mathematic/statistics, and chemistry. Details on their hours of operations can be found at: <http://www.lib.uoguelph.ca/get-assistance/studying/chemistry-physics-help> and <http://www.lib.uoguelph.ca/get-assistance/studying/math-stats-help>

7.3 Wellness

If you are struggling with personal or health issues:

- Counselling services offers individualized appointments to help students work through personal struggles that may be impacting their academic performance. <https://www.uoguelph.ca/counselling/>
- Student Health Services is located on campus and is available to provide medical attention. <https://www.uoguelph.ca/studenthealthservices/clinic>
- For support related to stress and anxiety, besides Health Services and Counselling Services, Kathy Somers runs training workshops and one-on-one sessions related to stress management and high performance situations. <http://www.uoguelph.ca/~ksomers/>

8 University Statements

8.1 Email Communication

As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

8.2 When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

Graduate Calendar - Grounds for Academic Consideration

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

8.3 Drop Date

Courses that are one semester long must be dropped by the end of the fortieth class day; two-semester courses must be dropped by the last day of the add period in the second semester. The regulations and procedures for course registration are available in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>

Graduate Calendar - Registration Changes

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-regchg.shtml>

8.4 Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

8.5 Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance and not later than the 40th Class Day.

More information can be found on the SAS website

<https://www.uoguelph.ca/sas>

8.6 Academic Integrity

The University of Guelph is committed to upholding the highest standards of academic integrity, and it is the responsibility of all members of the University community-faculty, staff, and students-to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff, and students have the responsibility of supporting an environment that encourages academic integrity. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

Undergraduate Calendar - Academic Misconduct

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

Graduate Calendar - Academic Misconduct

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

8.7 Recording of Materials

Presentations that are made in relation to course work - including lectures - cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

8.8 Resources

The Academic Calendars are the source of information about the University of Guelph's procedures, policies, and regulations that apply to undergraduate, graduate, and diploma programs.

Academic Calendars

<https://www.uoguelph.ca/academics/calendars>
