

University of Guelph
College of Biological Science
Department of Molecular and Cellular Biology

COURSE OUTLINE

DNA Replication, Recombination and Repair (MBG*4270)
Winter 2017

Course Goal

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

Instructor

Dr. Mark Baker (Professor, Molecular and Cellular Biology), Office – SSC 4453, mdbaker@uoguelph.ca

Course Schedule

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
1:30- 2:20 PM	MCKN Rm 115		MCKN Rm 115		MCKN Rm 115

Learning Outcomes

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

Course 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.

Courselink:

This course will make use of the University of Guelph’s course website on D2L (via Courselink). Consequently, you are responsible for all information posted on the Courselink page for MBG*4270. Please check it regularly.

Undergraduate Calendar:

The undergraduate calendar is the source of information about the University of Guelph’s procedures, policies and regulations, which apply to undergraduate programs. It can be found at: [Undergraduate Calendar](#)

Course Structure

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.

Tentative Lecture Topic Outline

LECT	DATE	LECTURE TOPIC
1-4	Mon Jan 9- Mon Jan 16	DNA structure and function
5-11	Wed Jan 18- Wed Feb 1	Replication of DNA and chromosomes
12-18	Fri Feb 3- Fri Feb. 17	Mutation
	Mon Feb 20- Fri Feb 24	Winter Break, 2016
19-26	Mon Feb 27- Fri Mar 17	Genetic recombination
27-33	Mon Mar 20- Mon Apr 3	DNA damage repair
34-36	Wed Apr 5- Fri Apr 7	DNA damage sensing

Methods of Assessment

Assessment	Value (% of final grade)	Date	Learning Outcome (see above)	Course activity
Midterm	30%	March 3	1-3	Lecture
Assignment-writing	15%	Feb 10	4	Lecture/Sci. Lit.
Assignment-thinking	15%	Mar 24	2	Lecture/Sci. Lit.
Final exam	40%	April 12	1-6	Lecture

Grades will be assigned according to the standards outlined in the U of G Undergraduate Calendar (p40H41).

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 9-April 7
- **Assignment:** Due dates: Critical Writing (Feb. 10), Critical Thinking (Mar. 24)
- **Midterm Exam:** In-class on Friday, March 3

- **Midterm Break:** February 20-24
- **Last Day of Classes:** Fri Apr 7
- **Final Exam:** Wed Apr 12 (11:30 AM-1:30 PM), Room 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 16, 2016** 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 7)**. 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](#)

Accessibility

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact the Centre for Students with Disabilities as soon as possible.

For more information, contact SAS at 519-824-4120 ext. 56208 or email csd@uoguelph.ca or see the SAS website.

Academic Misconduct

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 discourages misconduct. 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.

The Academic Misconduct Policy is detailed in the Undergraduate Calendar: [Undergraduate Calendar - Academic Misconduct](#)

Email Communication

As per university regulations, all students are required to check their <uoguelph.ca> email account regularly: e-mail is the official route of communication between the University and its students. Also please note, email questions that can be easily answered by looking at the course outline information or material posted on D2L, will not be answered.

Drop Date

The last date to drop one semester Winter, 2016 courses, without academic penalty, is **Friday March 10th**. For regulations and procedures for Dropping Courses, see the Undergraduate Calendar: [Undergraduate Calendar - Dropping Courses](#)

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 re-submit work at any time

Recording of Materials

Presentations which are made in relation to course work—including lectures—cannot be recorded in any electronic media without the permission of the presenter, whether the instructor, a classmate or guest lecturer.

Grading

If you are absent from classes during the semester, you will be expected to make up missed lecture and other relevant material on your own.

Exam Procedure

Do not bring laptops, phones, iPad or any other electronic devices to exams. Leave your phone at home or in your knapsack---if it is in your knapsack, make sure it is turned off. Phones that ring during exams will be put outside of the examination room. You are expected to bring a calculator to every exam. We do not provide calculators nor do we allow students to share calculators. Also bring photo ID to exams.

General Campus Resources

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](#)

If you are struggling to succeed academically:

- 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. [The Learning Commons](#)

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. [Counselling Services](#)
- Student Health Services is located on campus and is available to provide medical attention. [Student Health Services](#)
- 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. [Stress Management and High Performance Clinic](#)

If you have a documented disability or think you may have a disability:

- The Centre for Students with Disabilities (CSD) can provide services and support for students with a documented learning or physical disability. They can also provide information about how to be tested for a learning disability. For more information, including how to register with the centre please see: [Centre for Students with Disabilities](#)