MBG*1000 Genetics and Society

Winter 2018
Sections(s): C01

Department of Molecular and Cellular Biology
Credit Weight: 0.50
Version 1.00 - January 02, 2018

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1 Course Details

1.1 Calendar Description

This course covers the basic principles of genetics at work in human society. The roles of genes and inheritance in the biology of humans and the organisms with which we interact. Introduction to some of the social and ethical consequences of genetic knowledge and practice. This is a science course designed primarily for students in the Arts or Social and Applied Human Sciences.

Restriction(s): Students in the BAS, BSC and BSC(ENV) program cannot take this course for credit.

1.2 Course Description

No science is more central to contemporary life than genetics. Human health, reproduction and agriculture increasingly rely on an understanding of the hereditary mechanisms shared by all organisms. In **Genetics and Society,** we present the general principles of genetics, show how they operate in humans and other organisms and discuss their implications for individuals and society. Recent advances in the study of genetics and molecular biology have transformed our understanding of human heredity. Advances in genetics knowledge have the potential to solve many problems, but at the same time they present us with new dilemmas. As we consider the principles of this discipline we will also examine some of the ethical and social issues arising from genetic manipulation, reproduction intervention and biotechnology.

1.3 Timetable

(Please check WebAdvisor for any last-minute seminar room changes)

- Lectures: Monday, Wednesday and Friday; 11:30 am – 12:20 pm in THRN 1200
- Seminars (all on Monday):
  - Section 01: MCKN 230 from 12:30-1:20
  - Section 02: MCKN 232 from 12:30-1:20
  - Section 03: MCKN 230 from 2:30-3:20
  - Section 04: MCKN 225 from 1:30-2:20

- **Seminars begin on Monday, January 15th, 2018**

1.4 Final Exam

Saturday April 18th; 8:30-10:30 am. Location TBD

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2 Instructional Support

The teaching assistants are graduate students with heavy academic schedules. We ask that students DO NOT contact them directly outside the seminar time slots. Instead, direct your questions to Dr. van der Merwe should you have concerns.

2.1 Instructor(s)

George Van der Merwe
Email: gvanderm@uoguelph.ca
Telephone: +1-519-824-4120 x54298
Office: SC1 2243
Office Hours: Will be posted on Courselink
I respond best to email communication

2.2 Teaching Assistant(s)

Teaching Assistant: Olivia Grafinger

Teaching Assistant: James Haskins

Teaching Assistant: Olivia Lee

Teaching Assistant: Abdalla Mohamed

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3 Learning Resources

There is no required textbook for this course.

3.1 Required Resources(s)

Courselink (Website)
https://courselink.uoguelph.ca
The CourseLink site is a critical resource for this course. All lecture notes/slides and assignments will be posted on CourseLink. In addition, general course information, special announcements (e.g. office hours) and exam information will be posted here. Please ensure you consult this site frequently.

3.2 Recommended Resources(s)

Genetic Essentials: Concepts and Connections (Textbook)

- Genetic Essentials: Concepts and Connections (Third Edition; by Benjamin Pierce)
- Available in the Book Store
- Lecture notes, supporting reading materials and the assignments will be posted on CourseLink

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4 Learning Outcomes

There will be a series of lectures focusing on the genetic material of humans, the flow of genetic information within cells and the inheritance of such material. In addition, alterations of genetic information (mutations; viruses; targeted biotechnological approached) will be discussed.

4.1 Course Learning Outcomes

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

1. Describe and understand the flow of genetic information within an eukaryotic cell.
2. Describe and understand the various modes of inheritance of genetic traits.
3. Describe various mechanism(s) of alterations to genetic information.
4. Understand the impact of alterations to genetic material in individuals and society, specifically in the forms of various heritable diseases.
5. Describe and understand the concepts of the eukaryotic cell cycle and mechanism(s) of its control, specifically as it relates to cancer.

4.2 Note

Learning outcomes will be assessed in the relevant assignments, midterm and final examinations.

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5 Teaching and Learning Activities

A provisional schedule of lecture topics is attached. Material given in the lectures is the responsibility of the student. Students are expected to attend all lectures and all seminars. If you miss a lecture or seminar, 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 MBG*1000 Winter 2018 student(s) and may not be reproduced or transmitted to others without the written consent of the instructor.

5.1 Lecture Schedule: Tentative Topics and Dates

Lectures	Date	Lecture Topic	Seminars
1	Mon Jan 8	Introduction	NO SEMINAR
2	Wed Jan 10	The Central Dogma from Genes to Proteins	
3	Fri Jan 12	The Central Dogma from Genes to Proteins	
4	Mon Jan 15	The Central Dogma from Genes to Proteins	Meet your TA
5	Wed Jan 17	Mutations	
6	Fri Jan 19	Mutations	

7	Mon Jan 22	Origin of Phenotype: Autosomal recessive traits and their pedigrees	Assignment #1: Central Dogma & Mutations
8	Wed Jan 24	Origin of Phenotype: Autosomal recessive traits and their pedigrees	
9	Fri Jan 26	Origin of Phenotype: Autosomal recessive traits and their pedigrees	
10	Mon Jan 29	Origin of Phenotype: Autosomal recessive traits and their pedigrees	Assignment #2: Autosomal recessive inheritance
11	Wed Jan 31	Origin of Phenotype: Autosomal dominant traits and their pedigrees	
12	Fri Feb 2	Origin of Phenotype: Autosomal dominant traits and their pedigrees	
13	Mon Feb 5	Origin of Phenotype: Autosomal dominant traits and their pedigrees	Assignement #2: Return & help session
14	Wed Feb 7	MIDTERM #1: In class	
15	Fri Feb 9	Origin of Phenotype: Sex-linked Inheritance	
16	Mon Feb 12	Origin of Phenotype: Sex-linked Inheritance	
17	Wed Feb 14	Origin of Phenotype: Sex-linked Inheritance	
18	Fri Feb 16	NO CLASS	
	Feb 19 - 23	NO CLASSES - Winter Break	No Seminars - Winter Break
19	Mon Feb 26	Chromosomes & mitosis	Assignment #3: X-linked inheritance
20	Wed Feb 28	Chromosomes & mitosis	
21	Fri Mar 2	Chromosomes & mitosis	
22	Mon Mar 5	Meiosis & reproduction	Assignment #4: Chromosomes & Mitosis
23	Wed Mar 7	Meiosis & reproduction	
24	Fri Mar 9	Meiosis & reproduction	
25	Mon Mar 12	Meiosis & reproduction	Assignment #4: Return & help session
26	Wed Mar 14	MIDTERM #2: In class	
27	Fri Mar 16	Cell cycle & Cancer	

28	Mon Mar 19	Cell cycle & Cancer	Assignment #5: Meiosis & reproduction
29	Wed Mar 21	Cell cycle & Cancer	
30	Fri Mar 23	Cell cycle & Cancer	
31	Mon Mar 26	Cell cycle & Cancer	Assignment #6: Cancer
32	Wed Mar 28	Cell cycle & Cancer	
	Fri Mar 30	NO CLASS - Holiday	
33	Mon Apr 2	Viruses & Biotechnology	Assignment #6: Return
34	Wed Apr 4	Viruses & Biotechnology	
35	Fri Apr 6	Viruses & Biotechnology	
	Sat Apr 18	Final Exam 8:30-10:30 AM	Room TBA

5.2 Seminar Schedule: Tentative Topics

Week	**Assignment**	**Topic**	**Assignment Due Dates**
January 15th	No assignment	Meet your TA: General information about seminars.	
January 22nd	1	Assignment 1: Central dogma and mutations	In your regularly scheduled seminar on January 22nd
January 29th	2	Assignment 2: Autosomal recessive disorders	In your regularly scheduled seminar on January 30th
February 26th	3	Assignment 3: Sex-linked disorders	In your regularly scheduled seminar on February 27th
March 6th	4	Assignment 4: Chromosomes & Mitosis	In your regularly scheduled seminar on March 6th
March 20th	5	Assignment 5: Meiosis & Reproduction	In your regularly scheduled seminar on March 20th
March 27th	6	Assignment 6: Cancer	In your regularly scheduled seminar on March 27th

5.3 Note

The benefits of Genetics and Molecular Biology are evident in the analyses and problem solving of every-day scenarios. The seminars in MBG*1000 are designed to improve problem-solving skills and reinforce concepts and terminology introduced in lectures. Assignment and review questions will provide the framework for the seminar sessions. These questions will be posted

on CourseLink. **You are responsible for ALL material covered in seminars; similar questions WILL appear on midterm and final exams.** There are 10 seminar sessions and 6 seminar assignments. The schedule above outlines the assignment topics and due dates. To find the information needed to complete the seminar assignments, you will need to consult your lecture notes, biology/genetics books and/or internet material. There are **two grades** associated with the seminar assignments. The **first grade** is associated with the completion of all of the assignment questions. The **second grade** is associated with the grading of a particular question from each of the 6 assignments. For more information on the seminar assignments, assignment deadlines and the marking rubrics, please go to the course site on CourseLink and read the seminar assignment guidelines.

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6 Assessments

6.1 Assessment Details

Midterm #1 (22.50%)
Date: Wed, Feb 7, In Class

Midterm #2 (22.50%)
Date: Wed, Mar 14, In Class

Seminar Assignments (20.00%)

- Best 5 of 6
- 4% each X 5 = 20%

Final Examination (35.00%)
Date: Sat, Jan 13, 8:30 AM - 10:30 AM, TBA

6.2 Note

- **There will be NO "make-up/alternate" midterms or assignments.** Students who miss a midterm because of medical or compassionate reasons must provide Dr. van der Merwe (SSC 2243) with appropriate written documentation (from a medical professional or their program counsellor) **before the last day of classes.** If acceptable documentation is received the weighting of the missed midterm will be added to the final exam. For example, if a student misses the second midterm and provides appropriate documentation, the student's final exam will be worth 60% of the final grade. In the absence of acceptable documentation, the student will receive zero for the assessment.
- If a student misses 2 or more of the 6 seminar assignments, the value of the missed assignment(s) will be transferred to the final exam provided acceptable documentation (from a medical professional or their program counsellor) has been received. For example, if a student submits only 4 of 6 assignments, then 4% will be transferred to the final exam. **Again, acceptable documentation must be received before the last day of classes.** In the absence of acceptable documentation, the student will receive zero for the missed assignment(s).

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7 Course Statements

7.1 Exam Procedure

Always bring your student card (photo ID) to exams for us to confirm your identity. ALL exams are multiple choice; be sure to bring a pencil and eraser. Leave your **phone** in your backpack/hand bag and make sure it is **turned off**. Phones that ring during exams will be put outside of the examination room.

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8 Department of Molecular and Cellular Biology Statements

8.1 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

8.2 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

8.3 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/

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9 University Statements

9.1 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.

9.2 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 regulations and procedures for Academic Consideration are detailed in the Undergraduate Calendar.

9.3 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 Dropping Courses are available in the Undergraduate Calendar.

9.4 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.

9.5 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: www.uoguelph.ca/sas

9.6 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.

9.7 Recording of Materials

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

9.8 Resources

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

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