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

MBG*2040
Foundations in Molecular Biology and Genetics
Fall 2017

Course Goals

This course will provide an introduction to the disciplines of molecular biology and genetics. The first half will serve to develop an understanding of the fundamental concepts in genetics, including patterns of inheritance, allelic variation, gene interaction, linkage, recombination, gene mapping, DNA and chromosome structure and its variations. This will be followed by an introduction to the field of molecular biology and include the topics of DNA replication, transcription, translation, mutation and DNA repair, transposable elements and gene regulation. (0.5 credits, Prerequisite: BIOL*1090)

Teaching Team

Instructor: Dr. J. Uniacke (lectures 1-18), Office: SSC 2244, juniacke@uoguelph.ca, ext. 54739
OFFICE HOURS: Friday at 11:30 – 1:30 pm, SCC 2244 (or by appointment)

Instructor: Dr. V. Bamm (lectures 19-36), Office: TBA, vbamm@uoguelph.ca, ext. TBA
OFFICE HOURS: Friday 11:30 – 1:30 pm, TBA

Course Coordinator: Elspeth Smith, Office: SSC 3505, elspeths@uoguelph.ca, ext. 56583

Teaching Assistants: The teaching assistants are graduate students in the Department of Molecular and Cellular Biology. Please do not contact them outside of your tutorial sessions unless they have given you a permission to do so.

Lectures:
Section 1: Monday, Wednesday and Friday at 10:30 – 11:20 am in Rozanski Hall Room 104
Section 2: Monday, Wednesday and Friday at 1:30 – 2:20 pm in Rozanski Hall Room 104

Tutorials: Tutorials begin the week of September 11th. Please refer to WebAdvisor for your scheduled tutorial day, time and room.

Students are responsible for all material given in lectures and tutorials.

Learning Outcomes

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

1. Understand and predict how single-gene traits can be tracked in multigenerational pedigrees.
2. Understand that phenotype is the result of interactions between genetic and environmental factors.
3. Explain how chromosome assortment and recombination result in gametes with new allele combinations.
4. Understand how polyploidy is common in plants and rare in animals.
5. Explain how chromosomal nondisjunction events can cause aneuploidy.
6. Describe and discuss how structural changes in chromosomes can have medical and evolutionary significance.
7. Understand and describe the processes of DNA replication, transcription and RNA processing, translation and the genetic code.
8. Explain factors that contribute to genetic mutations and describe repair mechanisms and recombination events.
9. Describe bacterial genetics, viruses and transposons.
10. Understand the basic principles of genetic regulation.

Course Resources

Required Textbook: Principles of Genetics by P. Snustad and M.J. Simmons, 7th Edition, 2012. John Wiley and Sons, Inc. New York, NY.

The textbook is available on a 2 hour reserve in the library.

Course Web Page: There is a CourseLink (D2L) site set up for this course. This will allow you to access the course material, post questions on the discussion board (see below), access useful websites, and check your grades. You can access this site at http://courselink.uoguelph.ca. Your username is your Central Login ID and your password is your university email password.

You are responsible for all information posted on the CourseLink page for MBG*2040. Please check it regularly.

4 Steps to Getting Help in MBG*2040

Step 1: Read all posted instructions relevant to your question.

Step 2: Consult the discussion board on CourseLink.

The discussion board is an open forum to promote exchange of information between students. You are encouraged to post clear, concise questions and to try to answer other students' posts. When posting a question please use a subject line that clearly indicates the topic of your question, making it easy for other students to find topics they wish to discuss. The teaching team will monitor the discussion board and provide input when deemed appropriate. Please keep all questions and comments relevant to the course. Offensive postings will not be tolerated.

Step 3: Post your question to the relevant discussion board on CourseLink.
Step 4: If you are not satisfied by the responses, see an instructor during office hours.

Course Structure

Lecture topics: A provisional schedule of lecture topics and text chapter readings can be found below. Material given in the lectures is the responsibility of the student. Students are expected to attend all lectures and all tutorials. If you miss a lecture or tutorial, you should get the notes from another student in the course. Electronic recording of classes is expressly forbidden without prior consent of the instructors. 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 instructors.

Lecture	Lecture Topic	Text Chapters
1-5	Extensions of Mendelism	4
6-8	Variation in Chromosome Number and Structure	6
9-12	Linkage and Recombination	7
13-15	Bacterial Genetics	8
16-18	DNA and the Molecular Structure of Chromosomes	9
	Midterm Exam – Covers Lectures 1–18 **Saturday, October 28, 12:30 pm – 2:00 pm, ROZH**	
19-21	DNA Replication	10
22-24	Transcription and RNA Processing	11
25-27	Translation and the Genetic Code	12
28-30	Mutation, Repair and Recombination	13
31-33	Transposable Elements	17
34-36	Gene Regulation	18
	Final Exam – covers lectures 1-36 **Monday, December 4, 7:00 pm – 9:00 pm, Location TBA**	

Tutorials and Quizzes: The MBG*2040 tutorials are designed to reinforce concepts and terminology introduced in lectures and to improve problem-solving skills. Tutorials will consist of one in class assignment. During the tutorial, students will work though the assignment with the assistance of the Teaching Assistants, and hand it in at the end of tutorial. You are responsible for ALL material covered in tutorials. There are 9 tutorial sessions each with a corresponding assignment. Assignments are posted on Courselink in advance of each tutorial. Students must print out each assignment and bring it to tutorial. Assignments are marked for completion by the Teaching Assistants and worth a total of 7% of the final mark (best 7 of 9). See the schedule below for tutorial topics and dates.

Online quizzes open on Thursdays at 4:30 pm each week of tutorial. They are designed to both assess your knowledge on the tutorial and lecture material for each unit as well as provide practice for the midterm and final. Each quiz will be 30 min. in length and consist of 10 multiple choice or True/False questions. Quizzes will be available for one week, closing on the following Wednesday at 11:59 pm. Quizzes are worth a total of 14% of the final mark (best 7 of 9). Once each quiz closes you will be able to see your incorrect responses. At this time the quizzes will re-open as a midterm/final exam practice tool and you will have unlimited attempts for each quiz, however your original quiz grade will be final. Any questions regarding the online quizzes can be directed to the course coordinator.

Any dispute regarding your tutorial or quiz grade must be brought to the attention of the Course Coordinator within one week after the grade has been posted on CourseLink.

NOTE: Posting any tutorial or quiz questions on any social media or course material sharing websites violates University of Guelph copyright and Academic Integrity policies and will be considered academic misconduct. Please refer to the section on Acedemic Integrity below for more information regarding expectations and penalties.

Missed Tutorials or Quizzes: The mark for your tutorials and quizzes will be calculated from your best 7 of 9 marks. The first two missed tutorials or quizzes will be dropped as your lowest mark regardless of the reason for absence. If more than two tutorials or quizzes are missed the weight of either one can be transferred to the weight of the exam provided acceptable documentation has been received. Acceptable documentation must be received before the last day of classes and should be emailed to the course coordinator. Please note that the tutorials and quizzes are separate grade items therefore you can write a quiz even if you miss the corresponding tutorial.

Week	Topic	Quiz Opens/Closes
Week of Sept. 4	No tutorials scheduled	
Week of Sept. 11	Tutorial 1: Review questions on Mendelian principles	Sept.14 /20
Week of Sept. 18	Tutorial 2: Extensions of Mendelism	Sept. 21/27
Week of Sept. 25	Tutorial 3: Variation in Chromosome Number and Structure	Sept. 28/Oct. 4
Week of Oct. 2	Tutorial 4: Linkage and Recombination	Oct. 5/11
Week of Oct. 9	No tutorials scheduled	
Week of Oct. 16	Tutorial 5: Bacterial Genetics	Oct. 19/25
Week of Oct. 23	No tutorials scheduled – Midterm Oct. 28th	
Week of Oct. 30	Tutorial 6: DNA Replication	Nov. 2/8
Week of Nov. 6	Tutorial 7: Transcription	Nov. 9/15
Week of Nov. 13	Tutorial 8: Translation	Nov. 16/ 22
Week of Nov. 20	Tutorial 9: Mutation	Nov. 23/29
Week of Nov. 27	No tutorials scheduled	

Methods of Assessment

Assessment	Value (% of final grade)	Date	Learning Outcomes
Tutorial Assignments	7% (Best 7 out of 9)	In scheduled tutorials	1-10
Online Quizzes	14% (Best 7 out of 9)	Open week of tutorials	1-10
Midterm Examination	35%	Saturday, Oct. 28th	1-7
Final exam	44%	Monday, Dec. 4th	1-10

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

Midterm Examination: The midterm exam is scheduled on Saturday, Oct. 28nd at 12:30 pm – 2:00 pm. This exam will test you based on lectures 1-18. The midterm exam is compulsory and will count for 35% of your final grade. The format of this exam will be multiple choice. Alternate times will be set for midterm exams only if there is a direct conflict with another course or with a Gryphon Varsity event that is confirmed by the coach. No other reasons will be accepted (voluntary, medical, compassionate, or other reasons). **Conflicts must be reported to the instructor by September 29th.** If a student does not write the midterm exam they will receive a grade of 0% unless proper documentation is provided to the instructor. In cases with proper documentation, the weight of the missed midterm exam will be added to the final exam.

Final exam: The final exam is scheduled on Monday, December 4th at 7:00pm – 9:00pm. The final exam is a compulsory examination and will be cumulative. 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.

Academic Consideration:
https://www.uoguelph.ca/registrar/calendars/undergraduate/20152016/c08/c08-ac.shtml

Important Dates

Sept. 8	First lecture
Oct. 10	Fall Study Break - no lectures or tutorials scheduled
Oct. 28	Midterm exam **– Room assignment TBA**
Nov. 3	40th class day – Last day to drop courses
Dec. 1	Last lecture
Dec. 4	Final exam **– Location TBA**

University Policies 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: https://www.uoguelph.ca/registrar/calendars/undergraduate/current/

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 Student Accessibility Services (SAS) as soon as possible. For more information, contact SAS at 519-824-4120 ext. 56208 or email csd@uoguelph.ca or see the website: https://www.uoguelph.ca/csd/

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

Email Communication: As per university regulations, all students are required to check their <mail.uoguelph.ca> email account regularly: email is the official route of communication between the University and its students.

Drop Date: The last date to drop one semester Fall 2016 courses, without academic penalty, is Friday, Nov. 3. For regulations and procedures for Dropping Courses, see the Undergraduate Calendar:
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml

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

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

Exam Procedure: Do not bring laptops, phones or 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. You will be required to provide photo ID during 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. http://www.bsc.uoguelph.ca/index.shtml or https://www.uoguelph.ca/uaic/programcounsellors

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. http://www.lib.uoguelph.ca/about/about-our-teams/learning-curriculumsupport/learning-services
- SLGs are planned for MBG*2040 students. Go to the SLG website (http://slg.uoguelph.ca) for more information.

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, training workshops and one-on-one sessions related to stress management and high performance situations. http://www.selfregulationskills.ca/

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

- The Student Accessibility Services (SAS) 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: https://www.uoguelph.ca/csd/