

Department of Biology Course Outline

SC/BIOL 4270 3.00 Reproduction
Fall 2016

Course Description

Molecular, genetic, cytological and evolutionary aspects of sexual reproduction. Comparison of the regulatory genes and proteins of sexual differentiation in *Saccharomyces*, *Drosophila*, *Caenorhabditis elegans*, mice, human and plants. Evolutionary advantages and disadvantages of sexual reproduction; asexual reproduction through parthenogenic mechanisms. Focus on the Molecular aspects of reproduction. Three lecture hours. One term. Three credits.

Prerequisites

SC/BIOL 2020 3.00, SC/BIOL 2021 3.00, SC/BIOL 2040 3.00, SC/BIOL 2070 3.00.

Course Instructors and Contact Information

Course Instructor: Dr. Mike Gadsden mgadsden@yorku.ca * Room 3042 Seneca Building

*Please do not use the email function in Moodle.

Put your name & student number & relevant description of the email in the subject line. Please avoid text messaging language, and please sign off at the end of your email – don't be a mystery student!

Want to talk with me?

- Email me to make an appointment to get clarification or ask question/help. meetings by appointment.
- If you have a concern or a question that will take up a considerable amount of time to read or answer, I would greatly appreciate it if you would approach me in person, rather than sending me a long email. It will save both of us time and potential confusion.

Schedule

Classes: Tuesdays/Thursdays 11:30 am – 12:50 pm, 218 Stong

- Most classes we'll have one or more activities for which you'll earn Activities participation marks (for good faith effort).

Evaluation

Item	Weight of evaluation	Date
Midterm	20%	October 20
Critique 1*	15%	
Critique 2*	12%	
Team Project	35%	
<ul style="list-style-type: none"> - includes proposal, abstract, video, team evaluations, in-class presentation - 25% of grade is based on individual contributions, as assessed by observation, and self/team members' evaluations 		
Activities (In-class, online)	15%	(throughout the term)

***Critique 2 is optional.** If you opt not to do Critique 2, your Critique 1 will be worth 22% instead of 10%.

§ *Critique 1 article choice* with rationale must be approved by Sept. 21st.

Ⓕ *Critique 2 article choice* with rationale must be approved by Nov. 9th.

Important Dates

Midterm	Oct. 20, in class
Drop deadline	Nov. 9 However the course can be dropped on the last day of class with a "W"
Team Presentations	~ Nov. 1 - Dec. 1
Critique 2	Dec. 1, in class

NOTE: for additional important dates such as holidays, refer to the "Important Dates" section of the Registrar's Website at <http://www.yorku.ca/yorkweb/cs.htm>

Resources

Textbook: There is no textbook for this course! Original and review journal articles (as well as lecture information) will be used to examine various aspects of reproduction in diverse array of organisms. **Students are expected to read relevant/assigned papers prior to class.** Some assignments will also require additional research and reading of the scientific literature.

Website: The BIOL 4270 Moodle website will include announcements, course materials, resources and a discussion forum. www.yorku.ca/moodle **Course announcements** from the Moodle site may be sent to your **Yorku email**; **please check all your email accounts daily**. Issues with Moodle should be directed to ithelp@yorku.ca

Learning Outcomes

- Explain major concepts, methodologies, and issues in reproduction, demonstrating detailed knowledge in certain topics (*i.e.*, course topics).
- Gather, synthesize, interpret, and critically evaluate, information (including experiments and data) about reproduction from a variety of sources (*e.g.*, reviews, primary sources and mass media articles).
- Apply scientific knowledge and critical thinking to identify, define, and analyse problems, and design/suggest solutions or opinions.
- Summarize key points from a piece of scientific literature to provide relevant information and support in a written scientific assignment.
- Critique a primary article about reproduction, providing evidence to back up your assessment.
- Given an experimental figure (graphic) and associated experimental information, describe in your own words what is shown; evaluate whether a figure from primary literature agrees with statements by the paper's authors.
- Design and evaluate experiments that would test various hypotheses related to reproduction.
- Apply learning from other areas (*e.g.*, genetics, ecology) to reproductive problems, situations, and/or issues.
- Explain the use of model organisms in helping us to understand human reproduction.
- Communicate (orally and in writing) reproductive concepts clearly to peers and a scientific audience.
- Prepare clear, appropriately formatted figures and/or tables to represent and communicate experimental data.
- Edit and/or evaluate of classmates' written and oral assignments, providing constructive suggestions for improvement.
- Discuss and debate issues relating to reproduction.
- Describe some of the major, still unanswered questions in reproduction.
- Work effectively, responsibly, and collegially with peers in and out of class.
- Use technology (*e.g.*, Moodle forums, Google Drive) to share information while working on a project.

Course Content

What this course is about...

This course assumes that you have fundamental knowledge and understanding of basic biological processes, including DNA replication, cell division, genetics, natural selection, life history, and heredity. Essentially, reproduction looks at how organisms pass their genetic material on to subsequent generations. In this course we use the term reproduction broadly, as it relates to a range of biological fields including behaviour, physiology, anatomy and evolution. While we will discuss human reproduction, it is **not the focus** of this course. Rather we will explore the complexities of reproduction in a variety of species, from a variety of approaches and discuss what we can (and can't) extrapolate to gain knowledge and understanding of human reproduction. **Critiques** and **team projects** provide you with an opportunity to explore in more depth areas that are of particular interest to you.

What you'll be doing in this course...

While there is a component of the course that is lecture-based, it is minor and involves considerable class discussion. Rather, this course is set up to help you to **develop your skills in writing, thinking critically, collaborating, and presenting**—skills that will be useful no matter what your career—in the context of reproduction as a subdiscipline of biology. Class time is focussed on working through interesting/complex topics/concepts and we'll rely on primary literature to elaborate on these issues. **Class time is most effectively used if you have completed the appropriate readings ahead of time.** You'll get more out of it, and your team members will appreciate your effort. You may need to consult resources outside of those provided in the course in order to understand more complex issues—this is a great skill to develop (and is useful in the course assignments). I am here to help guide your learning; please ask me for help and guidance. During class or in course announcements, I'll point out problematic areas for students, but you may need to draw to my attention concepts that you find confusing (it is likely that other students have the same questions)! If you are struggling with an idea: talk to your fellow students (in class, on Moodle, study groups), find and read additional references, and/or come see me. As well, I will give you time, in class, to work on your team projects—use this time to your advantage. The course is work intensive, but I hope you find your experiences here valuable!

Participation is key to this course, and you won't succeed if you aren't willing to participate and collaborate. There are marks given for participation to encourage you to stretch your mind and discuss things in (and out, I hope) of class. The rules are pretty simple for earning participation marks: participation should be relevant and on-topic, and you must actually participate to get the marks. Telepathy is not an effective form of communication in the classroom. Please be respectful of your peers' thoughts and opinions; you can disagree, just do so politely.

Topics you might want to explore within this course:

- Why sex? Ideas of how sex arose and why it stuck around (*i.e.*, sexual vs. asexual reproduction)
- Epigenetics, imprinting and reproduction
- Reproductive technologies – as applied to humans and domesticated animals
- The evolution of sex chromosomes. Why do we have a Y?
- Regulatory genes and proteins in sexual differentiation – is there a genetic toolkit for all vertebrates? For invertebrates and vertebrates?
- Sexual selection – who selects whom, and why? (male competition, female choice, reproductive behaviour, sperm competition.
- Conservation and reproduction.
- Mechanisms of sex determination – potential impacts of climate change.
- You can genetically male, but physiologically female?
- Contraception on the horizon: what are the new possibilities and why might they work or not.
- Ethics of assisted reproductive technologies in humans

Experiential Education and E-Learning

e-learning: students may be asked to watch some screencasts prior to class.

Experiential learning: Students are asked to write for different audiences, including the public. As well, reflection is built into major activities. Students will develop team-work skills throughout the course.

Other Information

TurnItIn.com

In this course, you will be asked to submit electronic copies of any written work (e.g., article critique) to TurnItIn. This will ensure that your hard work, having been added to the database, cannot be plagiarized in the future by students at any university. More information on the TurnItIn registration and password will be provided later in the course.

You may opt not to use TurnItIn. If so, then you will be required to submit rough copies of your assignment, along with rough notes, copies of the articles you cited, with hand-written notes in the margins, dated printouts of database searches, etc.; in short, thorough documentation of your research.

Course Policies

- 1. Scheduling Conflicts:** Assignment and midterm dates are not negotiable. They have been structured to distribute your workload over the term and have been based on feedback from previous BIOL 4270 students. Scheduling conflicts (for valid reasons) for the midterms must be brought to my attention **at least two weeks prior to the midterm** so that alternative arrangements can be made.
- 2. Late Assignments:** Assignments submitted after the due date will have 10% deducted per day, and will be accepted up to 3 days after the due date. Submissions more than 3 days late will not be accepted. This is not negotiable.
 - Articles for the media and critique assignments must be approved by the date shown. Failure to have an article approved by the required date will result in a 10% penalty deduction from the corresponding assignment.
- 3. Midterm:** The midterm is short answer, as well as interpretation of figures from scientific articles that you have read in class. **You are encouraged to bring marked up copies of these scientific papers to your midterm.** If you miss a test with a legitimate documented reason, permission *may* be granted to take a makeup test. Only a 'York Attending Physician's Statement Form' OR a similarly detailed doctor's note (*i.e.*, NOT a form stating that you visited a clinic) will be accepted for medical excuses. All documentation supporting your excuse for missing a test must be received by me within 1 week of the missed test.
 - The midterm must be written in order to pass the course. Makeup midterms may differ from the original test.
 - There will be no transferring of weight between various assignments.
- 4. Team Project:** You will be held accountable for your role within your group for the Team Project and will sign a team charter (contract). Weekly team mini-assignments for which time is provided in class will count towards your team project mark or your activities mark. Teams must meet with me prior to presenting. See Team Project outline for more information.
 - The team project must be completed in order to pass the course.
- 5. Remarking of Assignments/Midterm:** Any marked term work (including tests/quizzes) may be submitted for re-grading within 5 business days of the work being returned (made available) to the student (*i.e.*, if you miss the class in which work was returned, the 5 business days begins the day work was returned in class). Remarking is only possible for *tests written in ink*; those written in pencil will not be remarked. The work must be accompanied by a reappraisal request form, available from 108 FS (Biology Undergraduate Office) with a written rationale providing valid reasons for the request for reappraisal; requests because 'I need a higher mark' will be denied. Reappraisal forms and accompanying course work should be submitted to 108 FS, clearly labelled for Dr. T. Kelly (there's a Dr. S. Kelly, so make sure you indicate which of us it should go to!). **Note: remarking can result in the mark being raised, confirmed, or lowered.**
- 6. Discussion of Marks/Grades:** To be fair and consistent, individual grades are not negotiable, particularly as there are opportunities to recoup marks. Grades are not "curved" (adjusted). Contact me about marks ONLY if there's a clear error in your mark (calculation, etc.) as soon as possible. You will not receive a response to other mark-related inquiries. **There are no alternative assignments that can be completed for students to increase marks (e.g., extra credit).**
- 7. Email Policy:** For course-related material, students should use their York U email

addresses (email from other addresses, e.g., hotmail are likely to be filtered as junk) and email biol4270@yorku.ca Do not use the Moodle email function. The subject line should include a brief mention of the topic of the email. The body of the email should have a clearly written message, and include your full name and student number.

8. **Discussion Forum Code of Conduct:** Students are encouraged to participate in the online Moodle forums; indeed forum posting is required for some assignments, including the team project. Postings on the discussion forum should be politely worded and courteous. Discussions about topics can be engaging, but at no time should individuals take 'shots' at other individuals. That is, it's ok to disagree with another student's position, but it is not in good form to make personal attacks. Please title topic threads with relevant key words such that others may easily discern the content! **Please note that the moderator (that's me) may remove inappropriate posts.** Post only material relevant to the course and it's topics (i.e., reproduction related). If posts give indications of violation of academic honesty or the Student Code of Conduct, further action will be taken.

University Policies

Academic Honesty and Integrity

York students are required to maintain the highest standards of academic honesty and they are subject to the Senate Policy on Academic Honesty (<http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/>). The Policy affirms the responsibility of faculty members to foster acceptable standards of academic conduct and of the student to abide by such standards.

There is also an academic integrity website with comprehensive information about academic honesty and how to find resources at York to help improve students' research and writing skills, and cope with University life. Students are expected to review the materials on the Academic Integrity website at - <http://www.yorku.ca/academicintegrity/>

Access/Disability

York University is committed to principles of respect, inclusion and equality of all persons with disabilities across campus. The University provides services for students with disabilities (including physical, medical, learning and psychiatric disabilities) needing accommodation related to teaching and evaluation methods/materials. These services are made available to students in all Faculties and programs at York University.

Students in need of these services are asked to register with disability services as early as possible to ensure that appropriate academic accommodation can be provided with advance notice. You are encouraged to schedule a time early in the term to meet with each professor to discuss your accommodation needs. Please note that registering with disabilities services and discussing your needs with your professors is necessary to avoid any impediment to receiving the necessary academic accommodations to meet your needs.

Additional information is available at the following websites:

Counselling & Disability Services - <http://cds.info.yorku.ca/>

Counselling & Disability Services at Glendon - <http://www.glendon.yorku.ca/counselling/personal.html>

York Accessibility Hub - <http://accessibilityhub.info.yorku.ca/>

Ethics Review Process

York students are subject to the York University *Policy for the Ethics Review Process for Research Involving Human Participants*. In particular, students proposing to undertake research involving human participants (e.g., interviewing the director of a company or government agency, having students complete a questionnaire, etc.) are required to submit an *Application for Ethical Approval of Research Involving Human Participants* at least one month before you plan to begin the research. If you are in doubt as to whether this requirement applies to you, contact your Course Director immediately.

Religious Observance Accommodation

York University is committed to respecting the religious beliefs and practices of all members of the community, and making accommodations for observances of special significance to adherents. Should any of the dates specified in this syllabus for an in-class test or examination pose such a conflict for you, contact the Course Director within the first three weeks of class. Similarly, should an assignment to be completed in a lab, practicum placement, workshop, etc., scheduled later in the term pose such a conflict, contact the Course director immediately. Please note that to arrange an alternative date or time for an examination scheduled in the formal examination periods (December and April/May), students must complete an Examination Accommodation Form, which can be obtained from Student Client Services, Student Services Centre or online at

http://www.registrar.yorku.ca/pdf/exam_accommodation.pdf (PDF)

Student Conduct in Academic Situations

Students and instructors are expected to maintain a professional relationship characterized by courtesy and mutual respect. Moreover, it is the responsibility of the instructor to maintain an appropriate academic atmosphere in the classroom and other academic settings, and the responsibility of the student to cooperate in that endeavour. Further, the instructor is the best person to decide, in the first instance, whether such an atmosphere is present in the class. The policy and procedures governing disruptive and/or harassing behaviour by students in academic situations is available at - <http://secretariat-policies.info.yorku.ca/policies/disruptive-and-or-harassing-behaviour-in-academic-situations-senate-policy/>