Department of Biology Course Outline

SC/BIOL 4270 3.00 Reproduction
Fall 2019

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. 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. Tamara Kelly biol4270@yorku.ca *don't use the Moodle email function

- Include name & student number & please put a relevant description of the email in the subject line.
- If you have a concern/question that will take a considerable amount of time to read or answer, please approach me for an appointment, rather than sending me a long email. It will save both of us time and potential confusion.

Want to talk with me?

- By appointment (in-person or via Skype).

Schedule

Classes: Tuesdays/Thursdays 10:00 - 11:20 am – 12:50 pm, VC 103

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

Evaluation

Primary Literature Analysis	32% (comprises several elements; due in Sept. & Oct.)
Midterm	21% (Tues. Oct. 29, in class)
Team Project	35% (comprises several elements throughout term; mainly Oct/Nov)
Activities (In-class, online)	12% (throughout term; e.g., minute assignments & peer evaluation)

See Moodle for a more detailed breakdown of each assessment component.

Important Dates

Critique	Thurs. Oct. 3 – you **must** attend this class; no exceptions
Peer Editing	Tues. Oct. 8 – you **must** attend this class; no exceptions
Midterm	Tues. Oct. 29, in class
Team videos	Wed. Nov. 6
Drop deadline	Fri. Nov. 9
Team Presentations	Thurs. Nov. 14 - Tues. Dec. 3

NOTE: 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. **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).
- 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

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, but includes a number of activities, including mating systems and parental investment. 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 (we'll also discuss what we can and can't extrapolate from other species to understand human reproduction). **Critiques** and **team projects** provide you with the opportunity to explore in greater depth areas that are of particular interest to you, as well as help you develop skills in planning, writing, team work, and oral presentation.

What will I be doing in this class?
A lot of different things. I'm not going to lie, this course has a lot of work! But that work is there because it's taking tasks we often think of as one giant hunk of work and showing you how to break them down. These are skills that are necessary for *any* field you go into!

While there is a component of the course that is lecture-based, it is quite limited and involves considerable class discussion (and thus participation). This course is set up to help you to **develop your skills in thinking critically, writing, collaborating, and presenting**—skills that are useful no matter what your career—in the context of reproduction as a subdiscipline of biology.

When readings are assigned, you'll be expected to do them on time and you'll get far more out of class if you come prepared. You may need to consult resources outside of those provided in the course to understand more complex issues—this is another great skill to develop (and quite useful in course assignments). 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 absolutely key in 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 material in (and hopefully out of) class. The rules are pretty simple for earning participation marks: participation should be relevant and on-topic, you must actually participate to earn marks (telepathy is not an effective form of communication in the class), and a good faith effort must be shown. Please be respectful of your peers' thoughts and opinions; you can disagree, just do so politely.

In this class, you'll get to choose your own topics for some of the assignments. While there is some latitude with topics this course will focus on biology, and not sociology or psychology, although these may occassionally come up. **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.
- Mating systems
- Conservation and reproduction.
- Mechanisms of sex determination—potential impacts of climate change.
- How can individuals be genetically male, but physiologically female (or vice versa).
- 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 and you're going to create your own videos!

Experiential learning: Students are asked to write and present 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: In this course you'll be asked to submit electronic copies of any written work (*e.g.,* article critique) first to TurnItIn and then to Crowdmark. This is to ensure that your hard work, having been added to the database

can't be plagiarized in the future by students at any university. You can opt out of TurnItIn—more information is available on Moodle.
You do NOT have the right to post ANY course materials including your papers, seminars to any websites nor to sell them. See the note in University Policies below.

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 (if possible) 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. Thereafter you will receive a zero. This is not negotiable.
    a. 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. All documentation supporting your excuse for missing a test must be received by me within 3 days of the missed test **and submitted to the online documentation submission form (link is on Moodle).**
    a. **The midterm must be written in order to pass the course.** Makeup midterms may differ from the original test.
    b. 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. See Team Project outline for more information.
    a. **The team project must be completed in order to pass the course.**
5. **Remarking of Assignments/Midterm:** Any marked term work (including the midterm) may be submitted for re-grading within 5 business days of the work being returned (made available) to the student (if you miss the class in which work was returned, the 5 business days begins the day work was returned in class). The work must be accompanied by a written rationale providing valid reasons for the request for reappraisal; requests because 'I need a higher mark' will be denied. If your answer is similar to an answer provided in an answer key you must demonstrate where you earned the marks (not simply write "I had the same answer as in the key") Reappraisal requests must be submitted to biol4270@yorku.ca. ***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 many opportunities to earn participation marks and 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: Use** biol4270@yorku.ca **NOT 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 must include your full name and student number.**
8. **Discussion Forum Code of Conduct:** You're 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. 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! **The moderator (that's me!) may remove inappropriate posts.** Post only

material relevant to the course (*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/

***Important* A note from the Faculty of Science Committee on Examinations & Academic Standards:**

Numerous students in Faculty of Science courses have been charged with academic misconduct when materials they uploaded to third party repository sites (*e.g.,* Course Hero, One Class) were taken and used by unknown students in later offerings of the course. The Faculty's Committee on Examinations and Academic Standards (CEAS) found in these cases that the burden of proof in a charge of aiding and abetting had been met, since the uploading students had been found in all cases to be willfully blind to the reasonable likelihood of supporting plagiarism in this manner. To avoid this risk, students are urged not to upload their work to these sites. Whenever a student submits work obtained through Course Hero or One Class, the submitting student will be charged with plagiarism and **the uploading student will be charged with aiding and abetting.**

Note that exams, tests, and other assignments are the copyrighted works of the professor assigning them, whether copyright is overtly claimed or not (i.e. whether the © is used or not). Scanning these documents constitutes copying, which is a breach of Canadian copyright law, and the breach is aggravated when scans are shared or uploaded to third party repository sites.

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.

Student's 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/

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

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 and submit an Examination Accommodation Form at least 3 weeks before the exam period begins. The form can be obtained from Student Client Services, Student Services Centre or online at

http://www.registrar.yorku.ca/pdf/exam_accommodation.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-andor-harassing-behaviour-in-academic-situations-senate-policy/