BIOLOGY 4270 3.0
Reproduction

GENERAL INFORMATION:

Calendar 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, humans and plants. Evolutionary advantages and disadvantages of sexual reproduction; asexual reproduction through parthenogenic mechanisms. Three lecture hours. One term. Three credits.

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 and discuss what we can (and can't) extrapolate to gain knowledge and understanding of human reproduction. Critiques and group seminars provide you with an opportunity to explore in more depth areas of interest to you.

While there is a component of the course that is lecture-based, it is only one part of the course; rather, this course is set up to help you to **develop your skills in writing, thinking critically, and presenting**. Class time is focussed on working through interesting/complex topics/concepts and we will 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 may need to consult resources outside of those provided in the course in order to understand more complex issues—this is great skill to develop (and is useful in the course assignments). I am here to help guide your learning; please ask me for 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.

Participation is key to this course. 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.

COURSE LEARNING GOALS:

- Explain major concepts, methodologies, and issues in reproduction, demonstrating detailed knowledge in certain topics (*i.e.*, course topics). [*Comprehension*]
- Gather, review, evaluate, and interpret information/research about reproduction (in reviews, primary sources and mass media articles). [*Comprehension, Application, Analysis*]
- Summarize key points from a piece of scientific literature to provide relevant information/support in a written scientific assignement. [*Application*]
- Given an experimental figure (graphic) and associated experimental information, describe in your own words what is shown. [*Application*]
- Apply learning from other areas (*e.g.*, genetics, ecology) to reproductive problems/situations/issues. [*Application*]
- Communicate (orally and in writing) reproductive concepts clearly to peers and a scientific audience. [*Application*]
- Prepare clear, appropriately formatted figures and/or tables to represent and communicate experimental data. [*Application*]
- Provide editing and/or evaluation of classmates' written and oral assignments. [*Application, Analysis*]
- Discuss and debate issues relating to reproduction. [*Comprehension, Analysis*]
- Work effectively and collegially with others in a class setting. [*Application*]

Course Instructor: **Dr. Tamara L. Kelly**
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Phone: 736-2100 x22972
Email: tljkelly@yorku.ca **(email is preferred to phone; please use BIOL 4270 in subject line)**
Office hours: 10 – 11 am Tuesdays and Thursdays. Also by appointment.

Please note: If you contact me by email, text messaging language is UNACCEPTABLE. And I really like salutations and signoffs…don't be a mystery student.

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.

Lectures: Tues. & Thurs. 8:30 - 9:50 am, Rm. 106 FS

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. https://moodle.yorku.ca

Course announcements from the Moodle site may be sent to your **Yorku email; please check all your email accounts daily.**

Discussion forums: 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 such that others may easily discern the content! **Please note that moderators may remove inappropriate posts.**

GRADING SCHEME:

Annotated Bibliography for Critique 1	5% (due Sept. 27th)
Critique 1 (Media-based article + primary research article)	15% (due Oct. 4th)
Peer Review of Critique 1	4% (due Oct. 11th)
Midterm	20% (Nov. 6th)
Group Seminar	18% (Nov. 13th – 29th)
Critique 2	20% (due Dec. 4th)
Activities (in-class, includes quizzes, presentation reviews)	15%* (throughout term)
Float**	3%
	100%

* in order to earn participation marks, you must participate in a meaningful way during class

**applied to highest of individual assignments: critiques/midterm/or annotated bibliography

- 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 last year's students.
- The midterm is short answer, as well as interpretation of figures from scientific articles.
- There are **no** alternative assignments that can be completed for students to increase marks.
- Any marked term work 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). The work must be accompanied by a reappraisal request form, available from 108 FS (Biology Undergraduate Office). There must be 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 Dr. Kelly's office in 108 FS.
- You will be held accountable for your role within your group for the Group Seminar and will sign a contract with your group.
- Groups must meet with me twice before presenting. Weekly group mini-assignments for which time is provided in class will count towards your group seminar mark or your activities mark.

Accommodation Statement:
Students who feel that there are extenuating circumstances that may interfere with their ability to successfully complete the course requirements are encouraged to discuss the matter with the Course Director as soon as possible.

Students with physical, learning or psychiatric disabilities who require reasonable accommodations in teaching style or evaluation methods are encouraged to consult with the Office for Persons with Disabilities (OPD) and ensure that requests for appropriate accommodations are arranged with the Course Director early in the term.

Religious Accomodation Guidelines (for other than Final Exams)
Students, who because of religious commitment cannot meet academic obligations, other than formally scheduled examinations…on certain holy days are responsible for giving their instructor **reasonable notice (*not less than 14 days*), of each conflict.** Solutions (up to the discretion of the instructor) may include: rescheduling the evaluation; preparing an alternative evaluation for that particular student; or recalculating the total evaluation in the course to eliminate the component that has been missed. You may be asked to produce a note from a local religious leader.

Academic integrity:
Students are expected to be familiar with and follow York University's policies regarding academic integrity. Please consult the lab manual and website below for more details:
http://www.yorku.ca/academicintegrity/students/index.htm
At this point in your academic career, it is expected that you understand what constitutes academic dishonesty. Charges of plagiarism or other academic dishonest behaviour is subject to much heavier penalties than if you were in first year. I would rather you not hand something in than plagiarise it!

Student information sheet – please see:
http://www.yorku.ca/secretariat/senate/committees/ccas/documents/Course%20Outline%20-%20Student%20%20Info%20Sheet%20-%20March%2027-06.htm

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 workd, 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. 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.
2. The midterms and quizzes will include written questions. If you believe that an answer was marked incorrectly, you must submit a written rationale and the paper for remarking within 1 week of the test/quiz being made available to you. Remarking is only possible for tests/quizzes written in ink; those written in pencil will **not** be remarked. ***Note: remarking can result in the mark being raised, confirmed, or lowered.***
3. In order to be fair and consistent with regards to the entire class, individual grades are not negotiable. **Contact me about marks ONLY if there is a clear error in your mark (calculation, clerical, *etc.*), as soon as possible. It is highly unlikely that you will receive a response regarding any other mark-related queries. Also, note that there are NO extra credit assignments available.**
4. Late assignments 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.

Topics (not necessarily in this order & subject to change):

- Comparison of asexual and sexual reproduction, examing the advantages and disadvantages of each.
- Types of asexual reproduction.
- Why sex? Ideas of how sex arose and why it stuck around.
- Evolution of X and Y chromosomes.
    - X-chromosome inactivation
    - How can we trace the evolution of the Y chromosome?
- Mechanisms of sex determination.
- Regulatory genes and proteins in sexual differentiation.
- Evolution of reproductive organs.
    - coevolution
- Sexual selection – male competition, female choice, reproductive behaviour, sperm competition.
- Reproductive strategies (*e.g.*, timing & number of reproductive episodes, mating systems, sperm competition, viviparity, life history tradeoffs, *etc.*)
- Conservation & reproduction → reproductive hormones
- Ethics of assisted reproductive technologies in humans
    - What drugs can enhance fertility and why?
    - Why is low sperm count an issue with human fertility?
    - How can a chemotherapeutic be used to increase a woman's fertility?
    - What can you do to increase male fertility?
- You can be genetically male, but physiologically female…
- Contraception on the horizon: what are the new possibilities and why might they work or not work?
- Sperm competition means different things in different organisms
- Are there basic genes that underpin both asexual and sexual reproduction?