Online Course Information

Instructor:
Prof. Mark E. Hauber, Dept. of Evolution, Ecology, and Behavior, School of Integrative Biology, University of Illinois at Urbana-Champaign
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Office Hours: 12-12:50 PM Fridays via Zoom
Teaching assistant info: TBA.

Catalogue Description: The biological study of sexual reproduction, through the survey of molecular and physiological processes and with reference to the function, ecology, behavior, and evolution of sexual and asexual reproduction in human societies and other organisms. Using student-driven library-research, and written and verbal team presentations on primary data papers, the course also explores scientific methods of originating, analyzing, interpreting, and writing up sex-focused scientific data.
Credit: 3 hours.
Letter grade only.

Expanded Description: Cloning and other mechanisms of asexual reproduction are extremely efficient evolutionary—they generate a perfect genetic copy of the parental genome. Yet, sexual reproduction is the norm of breeding in most biological lineages, including the human species. This course will try to answer the so-called "conundrum of the ubiquity of sexual reproduction", through lectures, readings, research projects, and discussions on the molecular and physiological processes, and the function, ecology, behavior, and evolution of sexual (and asexual) reproduction in human societies, animals, plants, and other uni- and multicellular lineages. We will introduce you to the scientific method and its presentation, the structure of a scientific paper, use a dedicated text book, readings from the primary data-driven scientific literature, an essay-writing exercise, and a team-based library research presentation project to provide our own biological conclusions on whether and why so many questions remain about sexual reproduction.

This course is not required for the IB major.

Course Structure: A weekly basis of 2 × 1.5 hrs of asynchronous lectures, 1 × 1 hr of instructor-driven ZOOM discussion groups to interact with students (offered at 4 x different times per week), a weekly total 3.5 hrs of readings, and a weekly total of 1.5 hrs of student exercises (e.g., library research, team projects, offline quizzes).

Learning outcomes include (1) classifying the proximate and ultimate patterns and causes of biological diversity, form, and function in sexual reproduction, (2) analyzing the healthy biology and pathology of sexual processes in humans, (3) solving quantitative questions using an instructor-provided data set, and (4) comprehending, synthesizing, and evaluating readings from the primary scientific data literature within peer reviewed papers on sex-research and reproductive biology.

Course Type and Schedule: Online, 2nd half of Spring semesters

Textbook and Readings: Mills A. (2018) Biology of Sex. Pp. 411. University of Toronto Press (ISBN: 978-1-4875-9337-7). Additional readings are also assigned for each week of the course and posted on Moodle.

Course Web Site: Materials and quizzes & exams for the course will be posted on the course Moodle site: https://learn.illinois.edu

Exams and Grading

Course Grading Philosophy

1) The standard 90, 80, 70, 60% scores are used as starting cutoff points for A, B, C, and D grades, respectively, with options for plus letter grades (e.g., A+, B+), but not minus letter grades.
2) Reading assignments for the course are provided on the course schedule. **The expectation is that you will have read this material before each week of the course.** Material from the text will be covered quickly and used as a starting point to explore topics in more detail in the online lectures.
3) There will be two non-cumulative exams, one writing assignment to summarize an original data paper from the peer-reviewed literature, and one team-based oral research presentation accompanying a powerpoint or Zoom slide show (25% each). As per University of Illinois requirement, we are obliged to check your identity as part of online courses: this will be done as part of the question and answer section following the narrated powerpoint presentations of your team presentation project via Zoom.
4) There will be fortnightly quizzes and all work/discussion/presentations and exams will be held online.

Exams can be made up only with proper excuse and documentation. If you are ill, you need a doctor's or McKinley or other health-provider letter – a note from the Emergency Dean does not substitute for a doctor's excuse. You must contact Dr. Hauber before the exam or as soon as possible after the exam to ensure that your absence is excused and that a makeup exam or other accommodation can be arranged.

Grading and Point Allocation

2 Exams – 40% (each 20%), non-cumulative based on multiple-choice, fill-in the gap, annotate-the-graph, and short-answer questions (1 hr duration each) on comprehending major themes in sexual reproductive biology.

1 Synopsis Writing Exercise – 25%, a synopsis-and-critique style assignment to evaluate one of three brief primary, peer-reviewed, data papers related to the topic of Darwinian sexual selection theory, selected by each student, 4-5 pages in length. This is an original writing project based on a short and generally accessible primary data paper published in a peer-reviewed scientific journal. *The three alternative articles include these publications (these will vary between different years):*

A) Podos and Cohn-Haft (2019) Extremely loud mating songs at close range in white bellbirds. Current Biology 29: R1068-R1069.
B) Walker and Pusey (2019) Inbreeding risk and maternal support have opposite effects on female chimpanzee dispersal. Current Biology 30: R62-R63.
C) Vrtilek et al. (2018) Extremely rapid maturation of a wild African annual fish. Current Biology 28: R822-R824.

Based on your familiarity of what a scientific paper contains from our discussions in Week 1 and prior readings of primary data papers in this course, your write up will include a summary of how this article fits in the general theme of the Biology of Sex, a focal discussion of the article's central

hypothesis and its predictions, an overview of the methods and analyses, details on the key results, including an explanation of the main message of one or more figures in the paper, your opinion of whether the discussion and conclusions follow from the data, and your suggestions for future directions along this line of research. In turn, you will be provided a detailed grading rubric on how each of these components of the assignment will be graded.

1 Oral and Slide (Team) Presentation – 25%, a 4-member team-based project to generate a 20-slide long and narrated presentation from synthesizing and analyzing primary, hypothesis-and-prediction driven data papers identified as the result of students' own conduct of library and literature research on one of 10 topics assigned by the instructor, on healthy or pathological human sexual biology. To assure individual accountability, the team-produced PPT presentation will be narrated separately by each team member on their own. Your topics might include the following: *Are men more talkative then women (or vice versa): assessing the experimental evidence from the published literature. Assortative mating by HLA haplotypes in humans: is there a western-science bias? Asexual reproduction is the norm of reproduction only in rotifers: alternative explanations.* You will be provided a detailed grading rubric on what to include and how the assignment will be graded.

4 Quizzes (10% total): multiple-choice and annotate-the-graph style questions (15 min duration; 2.5% each) on classifying proximate and ultimate processes in (a)sexual reproduction. You will be provided with the solution to each quiz on the day after you have taken it. One these quizzes will be based on a data set provided by the instructor and include calculations and quantitative problem solving to generate the correct answers.

Contesting Grades

Students who have questions regarding a grade in the course should confer directly with the instructor within one week of receiving the graded assignment. To contest a specific grade, you must submit a written statement (preferably via email) of what you believe was graded incorrectly and why the grade should be altered. No oral contesting of grades will be considered, nor will the instructor consider any contest of grades submitted after one week of posting.

Students who also believe the grade awarded is demonstrably improper by reason of capricious or arbitrary grading should confer with the Associate Director of Academic Affairs in the School of Integrative Biology. Students who are unable through such discussion to arrive at a mutually agreeable solution may file a written appeal with the Capricious Grading Committee of the School of Integrative Biology, in accordance with the Student Code. Prompt attention to these concerns is important. The appeal must be filed within six working weeks after the start of the next semester. Students may obtain the name of the committee chairperson from the school office.

For further information, refer to §3-107 of the Student Code:
https://studentcode.illinois.edu/article3/part1/3-107/

Disabilities Statement

If you require special accommodations, please contact Dr. Hauber via email as soon as possible. All accommodations will follow the procedures as stated in Article 1-110 of the Student Code (http://studentcode.illinois.edu/article1_part1_1-110.html). To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course instructor and the Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES you may visit 1207 S. Oak St., Champaign, call 333-4603 (V/TTY), or e-mail a message to disability@illinois.edu.

Code of Civil Class Conduct:
Students are expected to conduct themselves in accordance with the campus Student Code: https://studentcode.illinois.edu. This class will explore numerous sensitive topics and gender-based experiences outside of what your personal experiences may be. Because of this it is important to remember to discuss these subjects with the civility and respect. Any behavior determined not to comply with the Student Code will result in dismissal from the synchronous discussion group and further infractions may result in dismissal from the course. As a reminder, the Campus Integrity Statement states: "The University of Illinois at Urbana-Champaign expects its faculty, staff, students and guests to conduct themselves in accordance with the community values of civility, respect, and honesty; to maintain the highest level of integrity and exercise critical judgment in all dealings, decisions and encounters; and to maintain and strengthen the public's trust and confidence in our institution." You will receive three warnings if your language and comments are divisive or offensive. After these warnings you will receive a 0 on assignments in which your comments are deemed inappropriate. What does it mean to be divisive or offensive? The list includes: personal attacks, false statements with no basis in fact, demeaning someone's experience, belittling language, broad generalizations and stereotyping, amongst others. If you could not find a credible source to support something you are trying to state as a scientific finding, it is likely in this category.

Academic Integrity is essential to maintaining a learning environment that promotes excellence. We expect that all students will complete all academic and scholarly assignments with fairness and honesty. We adhere to the academic misconduct guidelines outlined by the Student Code of Conduct and will report any suspected academic misconduct using the FAIR system. Please see http://studentcode.illinois.edu/article1_part4_1-402.html for additional details. If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact Dr. Hauber.

Course schedule—next page.

Detailed course schedule (readings highlighted in light blue address women & gender issues and/or are senior-authored by women scientists).

Week	Module	Topic and Weekly Discussion (participate in 1 of 4 weekly synchronous Discussion times posted)	Text Book Readings (Mills 2018); *complete prior to watching weekly lectures*	Additional readings (articles will be available on Moodle website); *complete before weekly discussion session and fortnightly quiz*	Quizzes and Exams
1	Introduction	The scientific method and its presentation, the structure of a scientific paper	Chapter 1: 1-24	Holekamp KE, Sherman PW (1989) Why male ground squirrels disperse. American Scientist 77: 232-239.	Quiz 1: The Scientific Method (complete by Friday 5PM)
2	Evolution	Definition of sexual reproduction, selection experiments, diversity	Chapter 4: 101-142	Otto S (2008) Sexual Reproduction and the Evolution of Sex. Nature Education 1: 182-186	Exam 1: Weeks 1 and 2, (complete by Friday 5PM); Presentation Teams Assigned
3	Genetics	Molecular and cellular mechanisms, sex determination mechanisms	Chapter 3: 59-99	Emerson JJ (2017) Evolution: A Paradigm Shift in Snake Sex Chromosome Genetics. Current Biology 27: R800-803	Quiz 2: Sex determination mechanisms (complete by Friday 5PM)
4	Anatomy and Ontogeny	Gonadal morphology development	Chapter 2: 25-58	Brennan et al. (2007) Coevolution of Male and Female Genital Morphology in Waterfowl. PLoS ONE 2: e418-427.	Verbal and Slide Presentation (Team Project) on student-selected topic; upload your narrated project by Friday 5PM to Moodle
5	Physiology	Neural and endocrine mechanisms	Chapter 8: 255-287	Dodd et al (2019) Active feminization of the preoptic area occurs independently of the gonads in *Amphiprion ocellaris* . Hormones and Behavior 112: 65-76. With YouTube Video: https://news.illinois.edu/view/6367/801431	Quiz 3: Hormones and sexual maturation (complete by Friday 5PM)
6	Behavior	Sexual selection, courtship and mate choice	Chapter 6: 177-215	Select 1 of 3 available original data papers for the Synopsis Writing Assignment.	Writing Assignment Due by Friday 5 PM: Synopsis and Critique of Assigned Original Data Paper
7	Pathology and sexually transmitted diseases	Pharmacology and treatments	Chapter 10: 323-361	Garnett et al. (1997) The Natural History of Syphilis: Implications for the Transmission Dynamics and Control of Infection. Sexually Transmitted Diseases 24: 185-200.	Quiz 4: Quantitative Problem Solving (data set provided on-line; complete by Friday 5PM)
8	Sex, Gender, and Society	Definitions, usage, culture, and policies	Chapter 9: 289-322	Ah-King et al. (2014): Genital Evolution: Why Are Females Still Understudied? PLoS Biology 12: e1001851-858	Exam 2: Weeks 3-8 (complete by Friday 5PM)