

NE 2227: Multi-institutional Graduate Course in Reproductive Biology

Description: Current reproductive biology issues and research literature. Physiological, molecular, and cellular processes in reproduction. Formulate hypotheses in existing and emerging areas of reproductive biology, including central nervous system control of reproduction, gametogenesis, stem cell biology, ovarian physiology, embryogenesis, uterine function, placental biology, fetal development, infertility, and reproductive immunity.

Prerequisites: No formal prerequisites are needed for this course, but students need to have the background knowledge in reproductive physiology equivalent to what would be taught in an undergraduate reproductive physiology class. It is suggested that students review appropriate chapters in the Phil Senger textbook to refresh their memories of aspects of the reproductive system. The pre-recorded lectures are not all encompassing and are intended to supplement this expected background knowledge.

Credit Hours: 3

Class Times and Locations:

Wednesdays, 1 to 3 PM EST with a pre-recorded lecture for viewing before class time

ZOOM LINK: COMING SOON

Passcode: NE-REPRO

Instructor	Institution	Email
Cecily Bishop	Oregon State Univ.	cecily.bishop@oregonstate.edu
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Milo Wiltbank	Univ. Wisconsin	wiltbank@wisc.edu
Jen Wood	Univ. Nebraska	jwood5@unl.edu

Mentoring Services:

Student Mentoring is available for junior-level graduate students who require assistance with the course. Mentors will be chosen from the senior-level graduate students participating in the class.

Learning Objectives:

Having successfully completed this course, the student will be able to:

- Compare and contrast various reproductive processes that involve the neuroendocrine control of reproduction, gametogenesis, stem cell biology, ovarian physiology, early embryogenesis, uterine function, placental biology, fetal development, infertility and reproductive immunity
- Investigate new and emerging reproductive technologies that relate to neuroendocrine control of reproduction, gametogenesis, ovarian physiology, early embryogenesis, uterine function, placental biology and fetal development
- Interpret primary reproductive biology literature, theorize new avenues of research that apply to this work, and construct research plans to investigate hypotheses put forth in discussions and with independent exploration that incorporate physiology, endocrinology, cell biology and molecular biology to explain reproductive processes

Course Information and Format:

This course is a multi-institutional, team-taught course. Students will sign up for the advanced reproductive biology course at each of their respective universities. Student grades will be administered by the institution's lead instructor.

The course will combine pre-recorded lectures and real-time discussion-based learning sessions.

- Pre-recorded lectures will provide the fundamental background knowledge needed to participate in the course.
 - These lectures will be available to students for viewing at least 2 days before each week's class (by the Friday preceding the class time at 1 PM).
- Review articles and/or primary literature reading assignments will be given each week.
 - Students are expected to have read the assignments and be prepared to answer questions and participate in class discussions.
 - Students will be expected to be active participants in breakout group discussions of primary literature.

Zoom Web Conferencing will be used to deliver the live class sessions.

- The live sessions will be comprised of entire-group and breakout group discussions.
- Students may meet as a group or may sign on individually. If meeting as a group, headphones and microphones are recommended to accommodate participation at the break-out sessions.
- Lectures will be recorded and available to students for review purposes. The instructor or a designated student at each institution will be responsible for recording the live lecture, should they wish to do so.
- All course material each week will be provided to the students either through their institutional instructor (e.g. Virginia Tech students will have all materials available on Canvas) or by emails directly between the students and instructors.

For Va Tech students: Lecture, reading, and instructional materials will be made available through VT Canvas or via email.

Grading:

<u>Topic:</u>	<u>% Final Grade</u>
Participation:	25
Pre-lecture quizzes:	25
Breakout Room Discussion Leader:	25
Final Assignment:	25

Participation (25% of final grade):

- Class participation is an important component of this course. Students are expected to participate in a way that indicates a strong level of critical thinking. Reading about a topic prior to class, whether assigned or on the student's initiative, is an effective means to enhance one's ability to participate in class discussions.
- Student participation will be assessed each week. The lead instructor at each university, or an assigned proxy, will determine this grade each week by their own observations during the live sessions and by communicating with the breakout group instructors.
- The average grade for the semester will be used to calculate the final score.
- Student participation will be assessed based on the following:
 - Preparedness to discuss the topic assigned for the class
 - Ability to ask pertinent questions and answer questions
 - Being engaged in the discussion
- See the attached evaluation sheet for information on what specifically will be assessed each week.

Pre-Lecture Quizzes (25% of final grade):

- The recorded lecture(s) and quiz questions will be available at least by the Monday before the scheduled virtual class (before 5 PM).
- Quizzes must be completed by 1 PM on Wednesday (immediately before the live lecture begins).
- Quizzes will focus on making sure the students have listened to and understand the recorded lecture material.
- The lead instructor(s) for each week will grade these quizzes.

Breakout Group Discussion Leader (25% of final grade):

- Numerous manuscripts will be covered throughout the semester, and selected papers will be discussed in breakout groups.
- Breakout groups will be used each week with 4 to 6 students/group.
- All groups will review the same paper, but each group will have its own set of questions to address. These questions will be provided by the lead instructor(s) for that week.
- Students will be assigned randomly to different breakout groups each week.
- Students will take turns serving as the discussion leader for breakout room discussions.
- The discussion leader will be responsible for the following:
 - Leading the discussion for the 10-15 min breakout period.
 - The instructor(s) will provide the students and/or the breakout group leaders (dependent on the instructor) with specific questions to focus on during the breakout group discussion.

- Documenting responses to questions posed to the breakout group by the lead instructor(s).
- Documenting other discussions.
- Ensuring that each student in the breakout group contributes to the discussion.
- Providing a summary of the breakout group discussion to the entire class.
- Discussion leader performance will be assessed by the breakout group instructor.

Final Assignment (25% of final grade):

- Write and provide an oral presentation of the work of the Reproductive Physiologist of your choosing. Students will need to get approval from their institutional instructor to make sure the person chosen is acceptable.
- The written assignment should contain the following:
 - A brief biography of their academic career.
 - A description of three noteworthy research papers; one early, mid, and late career paper.
 - Include how many times these papers have been cited (this information is available on Google Scholar).
 - Articulate what overall impact, in your opinion, has the scientist had on the reproductive biology discipline.
 - Format: Five, single-spaced pages, including citations, with 1" margins and 12-pt font size.
 - Deadline for written assignment: **December 2, 2024** (Monday after Thanksgiving Holiday)
- The oral presentation should be composed as follows:
 - Record this presentation using PowerPoint or another easily usable program.
 - Present the details from your written assignment
 - Suggestion: cover the academic biography and then choose one of the papers or one notable area of research that you think was most transformative in the field of reproductive physiology and present the details of that work to the group.
 - Due date: **December 2, 2024**

Make-ups for Participation and Exams:

- No make-ups will be available for missed classes unless students have proper documentation of absence due to illness or family emergency.
 - The institution's instructor will decide how to make up for participation and written assignments. Suggestions likely will include providing a written or oral synopsis of missed paper discussions.
- Make-ups must be completed within 1 week of the student's return to campus to receive full credit for the assignment.
- Students will be responsible for contacting the instructor and setting up make-ups.

Lecture Topics and Schedule

	2024		
WEEK	DATE	TOPIC	LECTURERS
1	Sept 4	Introductions Course Overview and Expectations Tips on how to prepare for breakout group discussions Introduction: next week's material	Ealy and others
2	Sept 11	Neuroendocrinology & Puberty Introduction: next week's material	Cardosa, Moorey, Keating
3	Sept 18	Follicle 1: Primordial Follicle Activation Introduction: next week's material	Wiltbank, Ren, Keating
4	Sept 25	Follicle 2: Oocyte control of Follicle Growth Introduction: next week's material	Guerro Garcia, Wood
5	Oct 2	Follicle 3: FSH-dependent development; Selection, Dominance, PCOS, Ovulation Introduction: next week's material	Moorey, Bishop
6	Oct 9	CL 1: Development (differentiation, angiogenesis, steroidogenesis) Introduction: next week's material	Przygodzka, Bishop
7	Oct 16	CL 2: Maintenance (immunology, luteolysis, MRP) Introduction: next week's material	Hughes, Bridges
8	Oct 23	Oocyte Introduction: next week's material	Ren, Wood

9	Oct 30	Fertilization Introduction: next week's material	Fissore
10	Nov 6	Embryo/Conceptus/MRP Introduction: next week's material	Bridges, Ealy
11	Nov 13	Uterine/Conceptus Interactions Introduction: next week's material	Domingues, Stenhouse
12	Nov 20	Reproductive Technologies. ART, gene editing, pregnancy testing, etc	Guerro Garcia, Ealy, Others?