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BIOL 485-01, Senior Seminar: Reproductive Biology, Fall 2004

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Bio. 485(1) Senior Seminar: Reproductive Biology

Syllabus, Fall 2004

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Goals:

Rhodes requires all of its students to participate in a senior capstone experience. The purpose of this experience is to allow students to integrate knowledge from different sources and to refine their writing and speaking skills. In this class we will accomplish these objectives as part of a seminar concerning reproductive biology. A seminar course is one in which the participants teach and learn from each other through reading and discussion.

Specifically, my goals for this senior seminar are to give you the opportunity to:

1. learn and appreciate the biology of reproduction, especially in humans
2. refine your critical thinking skills and the ability to integrate different sources of information into a coherent picture
3. understand and evaluate how science is done by finding, reading and discussing primary literature
4. appreciate how information is transferred from the primary literature to advanced textbooks, introductory textbooks, or the popular press
5. develop your speaking and writing skills

To achieve these goals, the first and second parts of the course will be organized and run differently, although both sections will require you to read and discuss primary literature. To begin with, it is important for everyone in the class to learn basic background information about reproductive biology. This includes the subjects of male reproductive anatomy and physiology, female reproductive anatomy and physiology, fertilization and contraception, and pregnancy and birth. In another type of course I might simply provide a series of lectures on these four topics, but a seminar course provides you with the opportunity to learn by doing. Therefore, in the first half of the course you will work in groups to create a series of "lecture notes" about reproductive biology. Typically, lecture preparation involves reading several sources on a topic to get a complete picture, deciding what information is relevant and important, and synthesizing all of the information into an organized, comprehensible format. As you do this work in the beginning of the semester, not only will you learn the important background information in reproductive biology (which you undoubtedly will remember far longer than if you had merely listened to my lectures), but you will also gain experience that you will use in second part of the course. In addition to creating lectures, each student will also give a brief presentation on an assigned journal article that relates to the lecture material being covered.

During the second half of the semester, each student will give a longer and more formal presentation to the class on a topic s/he has chosen. This will allow everyone to learn about something important or especially interesting to you and will allow you to become the expert in that subject. Based on your experiences in the first half of the course, you should be well prepared to read and synthesize information from the primary literature and present it to a group

in a clear and organized format. You will also have had practice in leading your classmates through a critique and discussion of a primary research paper on your topic.

Course requirements: (details given below)

- A. Short presentation on a journal article (articles provided) (50 pts)
- B. PowerPoint presentation on a research topic (topics chosen) (100 pts)
- C. Paper on the research topic (100 pts)
- D. Written material (lecture notes, discussion and exam questions) (56 pts)
- E. Peer evaluations of papers and presentations (38 pts)
- F. Attendance at and critique of 2 departmental seminars (10 pts)
- G. Final exam (70 pts)
- H. Class participation (20 pts)

Explanation of Requirements:

A) Short presentation on a journal article (articles provided) - 50 pts

In the first part of the semester we will be learning background information about reproductive biology from group discussions intended to create a set of "lecture" notes. For each topic we will also be reading and discussing some primary literature concerning special issues within the topic. For example, while we are learning about female reproductive anatomy and physiology, we may read and discuss an original research article regarding what triggers an egg to mature. This will allow us to explore some subjects in greater depth and allow everyone to see some of the original research papers that are the sources of textbook information.

During the first class period, you will choose the article that you wish to present from a list provided. In preparation for the class presentation, **all** students are to read the journal articles. The presenter should also read any other background texts or journal articles that are necessary to acquire a clear understanding of the article and subject to be discussed. Your presentation should be 15-20 minutes with 5-10 minutes for questions and should have the following format:

1. an explanation of the research question investigated
2. why it was investigated (the importance or significance of the question)
3. a brief description of the methods used (including sample sizes)
4. the major results of the study
5. the conclusion(s) of the author(s)
6. at least one question you can ask of the class

Be prepared because others in the class will have questions for discussion!

We will not be using PowerPoints for these presentations, but feel free to provide handouts, use overheads or write on the board to teach the class about the paper. Just remember that you want people listening to you, not reading a book's worth of handouts.

B. PowerPoint presentation on research topic (topics chosen) - 100 pts

On Thursday, Sept. 16, each student will choose a topic to research and present to the class. The goal of these presentations is to increase the class's knowledge of reproductive biology as students teach each other about special topics of interest. Although these presentations are scheduled in the latter half of the semester, you should begin your research early in the term so that you have time to acquire and read the relevant literature. It often takes a long time to track down the appropriate journal articles and to read enough to fully understand the latest research on a topic. Another reason to start early is that you may find that your topic isn't a good one. For example, there may not be any good basic science articles available, or you may find that the information on your subject isn't interesting. If you start early, and decide you don't like your topic, then you still have time to change it and find appropriate literature. Although you may use other types of sources (reviews, books, websites), your presentation should be based mostly on current primary literature (since 1990). One of your primary literature articles should be assigned to the class, and much of your presentation (but not all) should focus on this reading. A clean copy of the reading assignment and an outline of your talk should be turned in at the start of class one week before the presentation. If you want to give the class a list of defined terms for your paper, turn that in with the outline. The format may vary slightly depending on the topic, but each presentation should include the following sections:

1. Overview of the topic (background information, context, significance leading up to a key question that is addressed by the assigned article)
2. Presentation and critique of the assigned research article (see 1-6 above)
3. Summary
4. Discussion of questions from class
5. A literature cited section. Be sure also to cite references in each slide.

For most topics, when you look at the primary literature you will see two types of articles. The first type includes case studies or clinical trials. For example, if you were interested in whether estrogen treatments cause breast cancer, case studies or clinical trials would report how many women in a population received estrogen and what percentage of them were found to have cancer. The other type of article is basic science and its focus is often mechanistic. Typically, these papers describe laboratory research, particularly experiments to demonstrate causation or the mechanism of causation. Some examples would be a study in which female lab rats were given specific doses of estrogen to see if there was an increase in breast tissue tumors or a study to determine if estrogen causes changes in RNA synthesis within cells in culture. Your presentation (and your paper) must include a good foundation of basic science articles, and the article you assign to the class must be basic science.

You will have 45 minutes for your PowerPoint presentation, with an additional ten minutes allotted for discussion. To avoid exceeding these time limits, be sure to practice your presentation! One point that is critical to remember: *Your talk should be an engaging, easy to follow lecture that prompts questions and discussion from your audience. It should NOT be a reading of the research paper you plan to turn in. The texts of papers and oral presentations are very, very different.*

C. Paper on research topic -- 100 pts

Your paper is due at the start of class one week after the oral presentation and it may incorporate aspects of class discussion. It may also have a different emphasis, since one goal of your oral presentation is to prompt discussion of a journal article and you may choose an alternative focus for your paper. The paper should be typewritten, double-spaced, with a 12 point font size and 1 inch margins. It should be about 10-15 pages long (not including figures or literature cited section). You will submit the original and two copies of your paper for anonymous evaluation by your peers (see section on Paper Evaluations below). The content of your paper should be divided as follows:

1. **Introduction:** This part should provide background and explain why the topic is important or of interest. It should also set up a current question or issue to be addressed in the discussion. There should be substantial depth here beyond the lecture notes and textbooks we have used in class, but it should be written so that anyone in the class can understand it. It should draw on a diversity of primary literature. (30 pts)
2. **Discussion:** This is the logical, organized presentation of the current critical issue(s) in the topic. It should address and give the most current answers (if known) to the key question(s) posed in the introduction. As in the introduction, this section should be based on recent primary literature, most likely including the article discussed in your oral presentation. It also may include substantial discussion of controversies found in the literature. (40 pts)
3. **Summary:** This brief section should recap the key points or conclusions. It should also state which side of the controversy you think is best supported (if appropriate) and where future research in this topic should go. (20 pts)
4. **Literature Cited.** Here are all the citations, i.e. the authors' names, dates, etc. from each source you used in your paper. Each paper listed here should be referenced in your paper, and each reference in your paper should be listed in this section. See "Referencing and Literature Citation" on the next page for more information (10 pts.).

Each section, especially the introduction and discussion, should be extensively and appropriately referenced. **Failure to do so may result in a grade of 0 on the paper, or possibly a trip before the honor council.** I expect that most of your references will be primary literature (a minimum of 5 primary literature references are required, and more than 5 are expected). How do you know what is primary literature? Be sure that you are clear on this before you proceed! Your paper will be read and evaluated by two anonymous reviewers so be sure to follow the guidelines provided (see also Paper Evaluation Form).

Referencing and Literature Citation.

You must cite all information gathered from your sources, whether or not the information is presented as a direct quotation. In the body of the paper you must use parenthetical notation (author's name and date) next to the information you have gleaned from that paper. Below are a few ways to construct a citation in the text. Note that only a direct quote from a source is put into quotation marks, that "et al." is used when there are more than two authors for a citation, and that multiple citations are listed alphabetically. You should also read the handout on plagiarism.

Human reproduction is a topic of great interest to college students (Gina et al., 1999; Terus, 2003; Varies & Estes, 2000).

According to Terus (2003), infants are not very interested in human reproduction.

Gina et al. (1999) and University Trends Site (2002) found that 87% of all college students read books about human reproduction.

"When offered textbooks on human reproduction, infants ignored them, except to drool on them occasionally" (Terus, 2003).

In the literature cited section, list all citations alphabetically by author. Do not include papers not cited in the text, even if you read them. If you used a chapter from an edited volume, the author's name is cited, not the book editor. The following examples are a journal article, a chapter from an edited book, a web site, and a book.

Gina, V.A., O. Varies, F.A. Lopian and C. Ervix. 1999. College students and the study of human reproduction. *J. Reprod. Res.* 45:136-155.

Terus. U. 2003. Juvenile and adult responses to human reproduction. In P. R. Ostate and S. Emen (eds.), *Human reproduction across the ages*, pp. 67-93. Wile E. Kyote Press., Ithaca, New York.

University Trends Site [web page] 15 March 2002; <http://www.univ.trnds.edu/repr/info.html> [accessed 10 August 2002].

(Web citations should be listed by author(s). Title of Article. [web page] date of publication or date last modified; the URL. [date you accessed it]. Be sure to have the correct URL)

Varies, O. and T. Estes. 2000. *College students' study topics*. Hotoff Da Press, Chicago.

Special Note: Anything discussed in your paper should come from articles you have read personally. However, on rare occasions you may need to use information cited in a paper and you can't get the original journal article*. In such an infrequent event, you will need to cite the information in your text as shown below. In the literature cited section you would include the complete references for BOTH Cowpers, 1996 and Varies and Estes, 2000.

Eighty-six percent of college students have relatives who read books about reproductive biology (Cowpers, 1996, cited in Varies and Estes, 2000).

*The article must not be available in Memphis. This citation method may not be used just because you didn't have time to get to the library

D. Written material (lecture notes, journal article summaries and discussion questions, and exam questions) --56 pts.

1. Lecture notes: These are produced as a group effort for the first four background topics. Each group is responsible for one topic (see first assignment on Male Reproductive Anatomy and Physiology for more information). (10 pts)
2. Journal article summary and discussion questions: For most classes you will be given a journal article one week before the class. You are to read the article and submit on the day of the presentation a typewritten summary (1 page max) of the following (due at the start of class): (36 pts)
 - a) a description of the research. Explain **in your own words** (don't copy the abstract) what was the point of the research, how they did it (briefly), and the results/conclusion.
 - b) at least 2 questions for discussion that you should be prepared to ask in class. These can be requests for clarification of specific points, may reflect disagreement with statements made by the author(s), or may question the validity of a technique or result. They may also be broader questions about the topic that relate to other areas of interest. These discussion questions may be answered by the presenter or by any other participant in the class. Sometimes the answer may even be "we don't know."
3. Exam questions (10 pts):
 - For lectures: each group will submit three questions per group member (a total of 6 or 9 questions depending on group size) for the lecture notes they develop. Due with the lecture notes.
 - For short presentations on journal articles: for each journal article, the presenter and 3 randomly selected students will submit one exam question each. These are due at the start of class following the presentation.
 - For longer presentations on research topics: the presenter will submit three exam questions. These are due with the paper at the start of class one week following the presentation.

E. Peer evaluation of presentations and papers (38 pts. No credit will be given for evaluations that are superficial or reflect an inability to critique).

- 1) For all presentations (18 pts): Following the presentation, students will be asked to fill out evaluation forms and provide a numerical grade and specific written comments for the presenter. These must be turned in to me by noon the day following the presentation. At the next class, copies of these anonymous peer evaluations will be given to the presenter, who will use them and his/her self evaluation to arrive at a fair numerical grade. The presenter will submit the grade and a written justification for the grade to me within one week. I will consider the written comments of the peer and self evaluations when I do my evaluation and grading of the work. The presenter should keep the evaluation forms and use them to make corrections or improvements in the next presentation.
- 2) For all research papers (20 pts): Two students will sign up to do anonymous evaluations of each research paper based on the criteria provided (thus, each student does evaluations of two different papers). Copies of the numerical grades and evaluations they complete will be given to the author of the paper, who will assign himself/herself a fair numerical grade. The author will then submit the grade and its written justification to me within one week. I

will consider the written comments of the peer and self evaluations when I do my evaluation and grading of the work.

F. Attendance at and critique of 2 departmental seminars (10 pts)

The Biology Department will host three seminars during the fall semester. After attending, you must submit a summary and critique by the next class. If you cannot attend one of these seminars, you may substitute another seminar at Univ. of Memphis, Univ. of Tennessee, etc. It will be your responsibility to find an alternative and have it approved before attending the seminar. Unless otherwise noted, the seminars begin at 4:15 on Mondays in FJ-B. Refreshments are served in the Biology Library at 4:00.

Sept. 20 Dr. Jon Russ, Chair, Department of Chemistry, Rhodes College
Biogenic coatings on rock surfaces: Ramblings of a chemist

Oct. 11 Dr. Nicholas P. Money, Professor of Botany, Miami Univ. Oxford, Ohio
Carpet Monsters and Killer Spores: A Natural History of Toxic Mold

Nov. 8 Dr. Robert D. Allen '91, Post-doctoral Fellow, Dept. of Microbiology & Immunology,
Yerkes National Primate Research Center, Emory University
Transcriptional Control of Gammaherpesvirus 68 Reactivation and Latency

G. Final exam (70 pts)

Throughout the semester you will have submitted several exam questions. The criteria for these questions will be distributed to you in advance. During the last two class periods the class will meet in groups to review the questions, select the best and most appropriate ones and work together to determine the best correct answer for each. The final exam will include the most appropriate and best written of these questions.

H. Class participation (20 pts)

A seminar is only as good as its participants, and for a class to be excellent, everyone needs to be there ready to talk. You are required to attend all classes and be on time. Late appearances and unexcused absences will result in a loss of points. Remember, the goal of a seminar is for us to learn from one another. If you are confused during a presentation, stop the presenter and ask a question. Your participation in that capacity will probably help others in the class to understand the concept better as well! At the end of the semester your performance will be rated approximately as follows:

20 pts -- participated frequently (at least once in all classes) and added substance to the discussion

15 pts -- participated frequently (at least once in all classes)

10 pts -- participated occasionally (not every class period)

5 pts -- participated rarely (once every couple of weeks), or questions and comments did not contribute much to the discussion

0 pts -- said something once or twice, or did not participate

Books

There is not a required textbook for you to purchase in this course. For the first part, when we work in groups, I will require you to use certain books that I will have "on reserve" in room 119w. There will also be other books that you may find useful throughout the course. Please be considerate of me and of others in the class and do not remove any of the books in 119w except to make copies, using the sign out sheet when you do.

During the semester, much of your reading will come from your own papers or the primary literature. When you need to make copies of your papers or a journal article for class, I will provide you with a senior seminar account number so you can make copies on the machine in FJ. At the end of the semester the total on this account number will be divided by the number of students in the class and each student will pay this amount as a "textbook cost." Keep in mind, this copier account number is only to be used for our senior seminar papers and articles. Misuse of our senior seminar account is not only unfair to your classmates, who will have to pay for your unauthorized copying, but it is a violation of the honor code.

Expectations regarding the Student Honor Code.

1. All assignments described above are to be done by you with no help from others. However, there are two important exceptions: 1) group research and notes for "lectures" on the first four topics (Male A&P, Female A&P, Fertilization, Pregnancy & Birth) and 2) the exam questions *for those lecture notes only*. The lecture notes each group submits are to be a combined effort with all members contributing equitably. Although each group member is responsible for creating three exam questions, the group should meet and discuss the questions to make sure that there is no redundancy. All other exam questions should be done independently.
2. When evaluating papers or presentations of peers it is your duty to be fair, honest and considerate with your criticism, and unbiased by your friendship with the presenter/author.
3. There is to be no misuse of the senior seminar copy number or the class "library" housed in FJ 119w (see section on "books" above)
4. Any work submitted for this class must not have been used for a previous class or a class you are taking concurrently.

Grading Scale:

93% ≤ A	87% ≤ B+ < 90%	77% ≤ C+ < 80%	67% ≤ D+ < 70%
90% ≤ A- < 93%	83% ≤ B < 87%	73% ≤ C < 77%	63% ≤ D < 67%
	80% ≤ B- < 83%	70% ≤ C- < 73%	60% ≤ D- < 63%
			F < 60%

Senior Seminar: Reproductive Biology Initial Class Schedule 2004

An updated schedule with names and titles of student presentations will be handed out when the information is available.

- Thurs, Aug. 25 Introduction, Group recall of Male Reproductive A&P
- Tues, Aug. 31 Create lecture of Male Reproductive A&P
- Thurs, Sept. 2 Finish lecture of Male A&P
paper pres: Johansson et al., 2004 (female immune response to sperm)
- Tues, Sept. 7 Review Male A&P lecture notes;
paper presentation: Mahato et al., 2000 (estrogen and spermatogenesis)
- Thurs, Sept. 9 Create lecture of Female Reproductive A&P
- Tues, Sept. 14 Finish lecture of Female Reproductive A&P
- Thurs, Sept. 16 Review Female A&P lecture notes; select topics for presentations
paper pres: Li et al., 1995 (activin and follicle development) or other
- Tues, Sept. 21 Paper presentations:
Johnson et al., 2004 (germline renewal in the ovary)
Barash et al., 1996 (effects of leptin on reproduction)
- Thurs, Sept. 23 Create lecture of Fertilization and Contraception
- Tues, Sept. 28 Finish lecture of Fertilization and Contraception
paper presentation: Fox et al., 1973 (vaginal pH)
- Thurs, Sept. 30 Review Fertilization and Contraception lecture notes;
paper presentation: Cohen-Dayag et al., 1995 (sperm capacitation and chemotaxis)
- Tues, Oct. 5 paper presentation: Lin et al., 1994 (sperm penetration of egg)
Create lecture of Pregnancy and Birth
- Thurs, Oct. 7 Continue lecture of Pregnancy and Birth
- Tues, Oct. 12 Finish Pregnancy and Birth lecture notes;
paper presentation: Stewart et al., 1992 (blastocyst implantation)
- Thurs, Oct. 14 Review Pregnancy and Birth lecture notes
paper presentation: Ou et al. 1998 (onset of labor)
- Tues, Oct. 19 (fall break, no class)
- Thurs, Oct. 21 student research presentation

Tues, Oct. 26	student research presentation
Thurs, Oct. 28	student research presentation
Tues, Nov. 2	student research presentation
Thurs, Nov. 4	student research presentation
Tues, Nov. 9	student research presentation
Thurs, Nov. 11	student research presentation
Tues, Nov. 16	student research presentation
Thurs, Nov. 18	student research presentation (paper due before Thanksgiving break)
Tues, Nov. 23	student research presentation
Thurs, Nov. 25	(Thanksgiving, no class)
Tues, Nov. 30	Discuss final exam questions
Thurs, Dec. 2	Discuss final exam questions
Tues, Dec. 7	Discuss final exam questions

MONDAY December 13 1:00 PM Final Exam