BIOL 485-01, Senior Seminar

BIOL. 485 Senior Seminar

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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 while refining their writing and speaking skills. In this class we will accomplish these objectives as part of a seminar concerning the molecular basis of cancer biology. A seminar course is one in which the participants teach and learn from each other through reading and discussion – the success or failure of this experience depends profoundly on the participation of the students.

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

1. Learn and appreciate the molecular basis of cancer.
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. Understand the differences between different sources of information as it applies to scientific process and understanding
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 reviews/primary literature and present your synthesis of this material to the class. To begin with, it is important for everyone in the class to learn basic background information about the molecular basis of cell growth, and disruptions of this that contribute to cancer. In another type of course I might simply provide a series of lectures on these topics, but a seminar course provides you with the opportunity to learn by doing. Therefore, in the first lectures of the course you will work in groups to create a series of "lecture notes" about cancer biology. These notes will be based on information that you compile from readings of different sources. 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 cancer biology (which you undoubtedly will remember far longer than if you had merely listened to my lectures), but you will also gain research experience that you will use in second part of the course. In addition to creating lectures, pairs of students will also give a brief presentation on a relevant technique that is used in the primary literature to facilitate our understanding of the molecular basis of cancer. Finally, pairs of students will also give a presentation on an assigned journal article that relates to the molecular basis of cancer. Each of these exercises are specifically designed to give you tools that you will use during the second part of the course, the presentation of a special topic related to the molecular basis of cancer, that is of your own choosing.

During the remaining time of the semester, each student will give more formal presentations to the class on a special topic that s/he has chosen. This will allow you to become the expert on 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 in your first presentation. During the second part of the course you will give two talks and write a paper related to your topic, all will be individual assignments. The first presentation will provide background information on your topic, and you should consider it a review of your topic. This review should prepare the class for a detailed discussion and critique of a primary literature paper that will take place in your second talk. The second presentation will focus on a primary literature paper of your choosing, that relates to your topic. These two presentations will occur on Tuesday and Thursday of the same week – on Tuesday you will review the topic and on Thursday you will present the primary literature paper. You will prepare these presentations *in advance*, and provide information in the review that allows students to better understand your primary literature paper. These two presentations should represent a coherent unit of information.

Course requirements: (details given below)

A total of 500 points can be earned in this course:

A. Lecture Notes and presentation of lecture notes to class (40 pts)
B. Short presentation on technique (40 pts)
C. Short presentation on a journal article (articles provided) (50 pts)
D. PowerPoint based review of special topic (topics chosen by you) (60 pts)
E. PowerPoint based presentation of primary literature paper (paper chosen by you) (60 pts)
F. Paper on the special topic (80 pts)
G. Exam questions (40 pts)
H. Peer evaluations of papers and presentations (40 pts)
I. Final exam (70 pts)
J. Class participation (20 pts)

Grading scale:

Points	Grade
465-500	A
450-464	A-
435-449	B+
415-434	B
400-414	B-
385-399	C+
365-384	C
350-364	C-
335-349	D+
315-334	D
300-314	D-
299 and below	F

The honor code applies to all work done in this course.

No assignments may be turned in beyond the scheduled time unless medical or personal emergency warrants it. In such cases, the professor must be consulted for approval **prior** to the deadline or as soon after as possible. In some cases, students may obtain permission from the professor to complete an assignment prior to the scheduled deadline. Missed assignments for unexcused reasons will receive a grade of 0.

Attendance is mandatory. Attendance is required for this course to be productive to all students – please come to every class prepared to participate. If you are unable to attend the class, points will be deducted and your grade will be impacted.

Explanation of Requirements:

A. Lecture Notes and presentation of lecture notes to class (40 pts)

(20 points) Individual answers to questions in background assignment. These will be due via email before the beginning of the second class.

(20 points) Group Lecture Notes. These are produced as a group effort for the background topics and an electronic copy will be turned in prior to the beginning of class on the day you are to present your lecture notes to the class.

B. Short presentation on technique (40 pts)

Pairs of students will take 15 minutes to discuss a specific technique frequently used in the papers that you will be reading through the semester. Understanding these techniques will significantly help you and your peers come to terms with the primary literature as you prepare for your longer research presentation. This presentation should include

1. A general statement of why a person would use this technique
2. The general steps required to carry out the technique
3. The controls that a person would include when doing this technique
4. What the data from this technique would look like – you need to find a primary literature article that uses this technique and show us an example that comes from the literature.

An electronic version of your presentation should be emailed to me or dropped in my academic volume in box (if it is too large to email). This must be done prior to the beginning of class on the day that you present. This holds true for all presentations given during the entire semester.

C. Short presentation on a journal article (articles provided to student) - 50 pts

In the first part of the semester we will be learning background information about cancer biology from group discussions intended to create a set of "lecture" notes. For each general topic (e.g. cell cycle regulation, cell death, cell signaling, and metastasis) we will also be reading and discussing primary literature concerning some special issues within the topic. 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.

In preparation for the class presentation, **all** students are to read the journal articles throughout the semester. If there is a lack of preparation for presentations by any student (ie, if you don't read the papers) I will create additional assignments to assess your reading of the paper, and your grading scale will be adjusted accordingly. How will I know if you have read the paper? YOU WILL ASK QUESTIONS ABOUT IT. This is a serious aspect of the course and will essentially cause the success or failure of the course as a whole.

The presenters 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. The presentation will be a formal discussion and critique of the research paper you were assigned. This should take 20 minutes, with 5 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 description of the methods used and why; focusing on a thorough discussion of the major figures (it is rarely possible to present all figures in a paper in 20 minutes – part of the assignment will be your ability to focus on those figures that are important for the conclusions that you feel are an important part of the paper).
4. The major results of the study (this in conjunction with #3 should be the majority of the presentation).
5. The conclusion(s) of the author(s)

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

You are required to use PowerPoints for your presentations. You may also provide handouts, use overheads or write on the board to teach the class what they need to know to understand the papers. Make sure that you make arrangements ahead of time for any equipment that you need. (Part of giving a good presentation is being prepared.) Just remember that you want people listening to you, not reading a book's worth of handouts. We will be very tight on time – so ALL of these arrangements must be made before class starts. Failure to do so will result in a reduction in points. You are expected to be in class well prepared for your presentation.

An electronic version of your presentation should be emailed to me or dropped in my academic volume in box (if it is too large to email). This must be done prior to the beginning of class on the day that you present. This holds true for all presentations given during the entire semester.

D and E. Presentations of special topic (topics chosen by student) (120 points total)

Each student will choose a topic to research and present to the class *that relates to the molecular basis of cancer*. This topic must be approved by me. Clinical trials of cancer treatment are NOT appropriate (see below). Each student will make two presentations about their special topic in one week – first a review of the topic on a Tuesday followed by a detailed critic of a primary literature paper on Thursday. The goal of these presentations is to increase the class's knowledge of cancer biology as students teach each other about special topics of interest. These presentations are scheduled starting in September, so you should begin your research **as soon as class starts** 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. Although you may use other types of sources (reviews, books, websites), your Review presentation on Tuesday should contain a ***synthesis*** of current

primary literature (since 1995). You will present one of your primary literature articles (approved by me) to the class. You will make this paper available to the class by sending me a copy, and I will post that article on moodle. A pdf copy of the reading assignment and an outline of your talk should be emailed to me *one week before the presentation*. You may also meet with me to discuss the outline of your upcoming talks.

The format of the Thursday presentation may vary slightly depending on the paper, but each presentation should include the following sections:

1. Overview of the topic as a recap of the Tuesday presentation (background information, context, significance)
2. Presentation and critique of the assigned research article; focusing on the figures of the paper and the relevant conclusions made by the authors.
3. Summary
4. Discussion of questions from class

For some 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 how gene therapy might be used in cancer treatment, case studies or clinical trials would report how many cancer patients in a population received gene therapy and how this treatment altered the patient's 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, and often rely heavily on model systems. Some examples would be a study of the mode of cell entry or targeting of a viral vector used in gene therapy for cancer using a mouse model of a certain type of cancer. 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**. Papers describing clinical trials ARE NOT APPROPRIATE for the focus of your presentation.

You will have 30 minutes for your PowerPoint presentation, with an additional five minutes allotted for discussion. To avoid exceeding these time limits, be sure to practice your presentation! It is crushing to give an A presentation, and get a B because you went overtime. You should have your PowerPoint presentation loaded on the server well before class, and you should come in early to make sure that it works properly. One point that is critical to remember: *Your talk should be created independently as an oral presentation of the information. It 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*.

F. Paper on research topic -- 80 pts

Your paper is due at the start of class one week after your primary research article presentation and it may incorporate aspects of the class discussion (ie, if you learn something during the oral presentation, you should incorporate it into your paper). It may also have a different emphasis, since one result of your oral presentation may be a better understanding of your topic, and you may choose an alternative focus for your paper. However, the bulk of the paper should be written AS YOU PREPARE your oral presentation. The paper should be typewritten, double-spaced, with a 10-12 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). This is essentially a review article on your topic. 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. There should be substantial depth here beyond the 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, and should reflect much of what you went over in your review oral presentation.

3. Discussion: This is the logical, organized presentation of the topic. It should cover the key questions and answers (if known) using recent primary literature on the topic. It is important to integrate information from many papers into this section, with full and accurate references. This section will be the bulk of your paper (approximately 80%), and you will likely break this into parts, with appropriate headers for each section.

4. Summary: This brief section should recap the key points or conclusions. It should also state where future research in this topic should go.

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.

Each section, especially the introduction and discussion, should be extensively and appropriately referenced. Failure to do so may result in loss of 20-50% of the points in that section. At least **five** of the references cited should be primary literature. 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 with the course.

G. Exam questions - 40 pts.

Throughout the semester you will turn in exam questions AND THE ANSWERS to these questions that relate to the material covered in the class.

For background Notes: each student will submit two exam questions with answers relating to the lecture notes they develop. These are due with the final lecture notes. A copy must be emailed to me.

You must turn in one exam question with answer for each presentation that you give (assigned paper, topic review, topic primary literature paper). This is due one week after your presentation, and should be emailed to me.

Each student will be randomly assigned various presentations throughout the semester. You must turn in one exam question with answer for each presentation that you have been assigned. This is due one week after the presentation, and should be emailed to me.

Each student will turn in one exam question with answer for their research paper. This will be due at the time of the final paper, and should be emailed to me.

Each reviewer will turn in on exam question with answer for the papers that they have reviewed. This will be due at the time of the review, and should be emailed to me.

H. Peer evaluation of special topics research papers (40 pts.) No credit will be given for evaluations that are superficial or reflect an inability to critique.

Two students will be assigned to do anonymous evaluations of each research paper (thus, each student will evaluate two different papers). Copies of the numerical grades and evaluations they complete will be given to the author of the paper and used by the author to make corrections to his/her paper.

I. Final exam (70 pts)

Throughout the semester you will have submitted many exam questions with answers. During the last 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, in addition to questions written by me.

J. 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 about material in a presentation, 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
18 pts -- participated frequently (at least once in all classes)
15 pts -- participated occasionally (not every class period)
10 pts -- participated rarely (once every couple of weeks), or questions and comments did not contribute much to the discussion
5 pts -- said something once or twice,
0 pts -- did not participate

Expectations regarding the Student Honor Code.

1. All assignments described above are to be done by you with no help from others. The only exception to this rule is when you are preparing group research and notes for "lectures" on the topics (Cell Cycle Regulation, Cell Signaling, Cell Death, and Metastasis); and working in pairs on the techniques and assigned paper presentations.
2. When evaluating papers or presentations of peers it is your duty to be fair, honest with your criticism, and unbiased by your friendship with the presenter/author.
3. Any work submitted for this class must not have been used for a previous class or a class you are taking concurrently. BE CAREFUL HERE!!!

Statement on inclement weather
It is incredibly rare for me to cancel class.
If Rhodes is open, I will get here. If Rhodes is open – COME TO CLASS.