OBJECTIVES

The purpose of this course is to give you at “capstone” experience during your tenure at IPFW. Our approach is to encourage critical reading and in depth review of a single cohesive topic, and then have you prepare a formal verbal presentation and written paper on that topic. To that end, you will be required to read, comprehend, and critique research results from the primary literature, i.e., publications of original research in refereed journals.

A major goal of this course is to allow you to demonstrate your understanding of a topic of current biological research. Doing so will involve examination of papers from the primary scientific literature. For students who have been involved in research within the department, the presentations may relate your own research and/or the larger research project with which you assisted. In that case, the focus should be on your research and its relationship to that of other research in the field, as assessed through a review of the primary literature.

With the assistance of your faculty mentor, you will be expected to synthesize the findings of multiple studies to evaluate our current state of knowledge, including what has been discovered and what remains to be learned. The major products of your efforts will be a presentation to the Department of Biology and a paper on the same research topic. Additionally, you will be asked to review and critique other seminar speakers in order to become a more effective listener and presenter yourself.

OVERVIEW OF TASKS

1) Identify a mentor. Based on your professional and personal interests, identify a faculty mentor for your activities in this course. A list of the primary research interests of faculty members of the Department of Biology is provided to facilitate mentor selection. Mentors are discussed in detail in the next section.

2) Define a topic. Select a biological concept to investigate which is not clinically based. Get your mentor to approve it and sign off on the topic sheet, and return it to me by the third Friday of the semester. For fall 2011 that is September 9.

3) Gather and process background information. Collect, read, and critically evaluate at least six peer-reviewed sources from the scientific literature.

4) Attend class presentations and prepare reviews of five of them. Use the downloadable form, type up your comments, and return within ten days.

5) Prepare your presentation using PowerPoint or similar program.
6) At least 10 days before your presentation, and earlier if possible, send the departmental secretary (PrayG@ipfw.edu) an email with your title, your name, the date of your presentation, and an abstract of your presentation.

7) Give your presentation. Be professional, engaging, and entertaining. You must provide digital and hard copy to the instructor at least one day prior to your presentation.

8) Write and submit your term paper by the Friday before "dead week." For fall 2011 that is December 2.

ROLES OF MENTORS

You must work with a mentor to receive credit for the course. You cannot pass the course without doing so. Inadequate interaction with your mentor may also result in a lower grade. Those students who present their own research will select their research advisors as mentors. For those of you who have not done your own research projects, a list of faculty members and their broad fields of interest is attached to help you select someone.

A faculty member is not required to serve as your mentor. Some individuals may be too overloaded with mentoring requests or other tasks in a given semester to accommodate everyone. If that is the case, the faculty member may help suggest other possible mentors appropriate to your interests.

Your mentor may provide some guidance about selection of papers to use as references or how to search for them. In addition, your mentors may be able to help with interpretation of the paper, especially for questions relating to methodology and experimental design. When you have prepared your talk, your mentor may be willing to view a practice session and make suggestions about your communication, content, organization, legibility of tables, and other issues. Some mentors may be willing to scan your term papers to answer broad questions. However, the presentation and paper are your responsibility, not the mentor’s.

YOUR PROJECT

Your project may be your own original research, or may be based on the work of others – synthetic research based on the available literature. Either way, you are conducting an investigation and reporting on it. When selecting a topic, choose a biological concept to investigate, avoiding clinical studies (such as reporting on clinical trials of a new drug) as the central focus of your work. You should also avoid a “my favorite disease” or “favorite animal” type of topic.

Your project idea will need the support of your mentor. To get that and document it, return the topic sheet we provide with title, one paragraph abstract, and faculty signature to me by the third Friday of the semester.

You must demonstrate a familiarity with your topic, in part expressed by literature review. How much literature you review will be influenced by your topic and how you approach it. However, to pass you minimally must have at least three sources from the primary literature,
while the remainder may be from other sources, such as reviews. Clinical references may be included, but only as background rather than as focus. Web sites are not primary literature, although you may use electronic journals if they are peer-reviewed. Papers published in journals that are not available at Helmke Library may be obtained through Document Delivery services (see library website). Online databases such as http://www.jstor.org are also useful. Make sure you allow ample time to acquire your resources.

**CRITICAL REVIEWS**

You will critically review five presentations by class members or others who speak at the scheduled class time. The reviews will be evaluated based on how you address aspects of the content and style of the presentations. A worksheet is provided to guide preparation of your reviews and you must use that worksheet when submitting your review. Answers should be thoughtful and will each likely be a few sentences long.

**YOUR PRESENTATION**

1) Prepare an outline of your approach to the topic. Your mentor and I can review that with you to see if I feel it is adequate. Begin with an introduction to the conceptual issue. Perhaps you will pose a question you wish to answer, or a hypothesis you wish to test. If you will present a talk based on a review of the literature, make sure that your presentation is synthetic rather than organized as paper 1, paper 2, etc. If you will be presenting your own research, you should focus on those references that are most pertinent. Cite individual papers as needed to introduce your research topic or to interpret/evaluate your findings. A thorough understanding of the selected papers is expected, including the research methodology and experimental design.

2) Prepare the presentation. Do not develop your talk as a series of subpresentations each focusing on the individual primary sources. Avoid introducing them by saying something like “My first paper deals with ...” or “The third paper is about ...” This is an avoidable error in Senior Seminar which will lead to a reduced grade. It is not necessary and generally undesirable to simply present each paper in sequence, unless they explicitly build upon one another. Again - failure to avoid this pitfall will likely lead to a lower grade.

Instead, focus on developing your topic, introducing papers as needed based on their bearing on your topic or question. For example, one paper may relate findings of a project done to test an idea presented in another paper. Tie everything together so it is clear as to how they relate to one another. When research from primary papers is introduced, you should provide the complete citation for the paper, commonly in smaller font towards the bottom of the slide.

Critical analysis is expected. Some questions to consider: What were the strong points of the research? What were the weak points? Are the conclusions of the paper's authors convincing? What would you do differently? Are the conclusions of the papers in agreement? If so, tell how the papers complement one another and strengthened the overall conclusions. If not, highlight disagreements and give your own solution or opinion. If
you have been rigorous in your literature review, you should be in a position to provide such critiques.

A main goal of your presentation is to provide the basis for an understanding of the main issues, evidence and conclusions for biologists who are not experts in the specific field of your presentation. Thus your presentation should be aimed at an audience consisting of professors and upper class biology majors who are not experts in the subject of your talk. You may need to provide definitions and explanations that clarify the terms, concepts and evidence from your studies. The talk must be from 15 to 20 minutes. Exceeding the 20 minute limit because you did not properly use your time may detract from your grade.

Do not present details of methods (such as the concentration of solutions, the names of specific reagents or instruments). You also do not need to present all of the data from each paper. The better strategy is to present less data with more explanation. When presenting graphs, it’s a good idea to describe the axes for the audience. Emphasize or repeat key points. Be careful when using specialized acronyms, such as the names of particular genes, proteins or cell lines. They should be explained and it may be a good idea to remind the audience of their meaning on successive slides.

Common problems in slide construction are too much text, too small of a font (20 pt is pushing it), tables that can’t be read, and blurry copies of tables and figures. A common error that combines several of these problems is to show a list of references at the end of the talk in a font that is too small to read, and is only put on the screen for a second or two. Why do that?

3) Practice. Practice is important to improve your delivery and to fit the talk into the required time limit. After you have practiced, ask other students or friends to view the talk and make suggestions. If you ask your mentor to view your talk, allow plenty of time before your presentation. Professors are busy people and cannot be expected to handle last minute requests. With at least a week’s notice, you are much more likely to be able to schedule a meeting for a practice talk.

4) Make the presentation. Provide me with paper and digital copies of your presentation before you give it. The preferred hard copy format is three slides per page with room for notes.

Address your audience directly. Do not just read notes or your PowerPoint slides. You should talk about what is shown on the slides, not just repeat it. Thus, it’s better to keep the words on your slides brief and to expand on meanings and significance.

5) You are limited to 20 minutes for your presentation and for subsequent questions. As you approach the 20 minute limit, I may stand or otherwise indicate that you need to finish. I will ask you to stop if you exceed your time, or may stop the question period if time is not available. This approach is not to harass the students, but to mimic the orderly style typical of professional meetings and to insure that all of the presenters have their full time as well.
YOUR PAPER

You will write a review paper on the same topic as your presentation. The paper would likely be about 10 perhaps more typed, double-spaced pages of narrative text, plus a reference section and any figures or tables. This is not a strict page minimum, but it is less likely that a shorter paper will sufficiently cover the topic. On the other side of things, long does not equal good. Keep things concise and focused.

Make sure that your paper has structure to guide the reader. If your paper is one long narrative with no headings after the title, something is wrong! If you present your own research, the paper should be organized as a scientific paper, with separate Introduction, Methods, and Results/Discussion sections. The main focus should be on presenting the research topic and the synthesis of your data with that of other researchers in the same field. For presentations based on review of the literature you have a little more flexibility so long as you adhere to the constraints below. However, organization into subsections is suggested to facilitate the reading and analysis of the papers by faculty evaluators.

The title page should include only the title of your paper, your name, and the name of your mentor, BIOL 491, and the semester and year (e.g., Spring 2005). In the body of the text, citations should be given using either or both of the following two styles (but not both in same sentence). Do not use numbered foot notes or superscripts for citing references. Do not include the author’s first names.

“Johnson (2004) reported that ...”             Single author
“Johnson and Smith (2004) reported that ...”  2 authors
“Johnson et al. (2004) reported that ...”     Multiple authors

“The aroma of skunks is significantly more disgusting than that of roses (Johnson, 2004).”

In the text avoid making statements such as “In a paper called “Skunks stink,” Johnson and his colleagues reported that .... Report the findings or hypotheses relevant to the discussion at hand and include a citation. Readers of your paper can look up the title at the end of the paper if desired.

Complete references should be given immediately following the text of the paper in a section called REFERENCES or LITERATURE CITED. Use the following formats. Note that you need the names and initials of all authors, not just the first author. The reference should be an alphabetical list by the first author’s name.

Journal article:

Book chapter:
Book:

Tables and figures should be embedded in the narrative text like you would see in a published paper. Each figure and table should include a descriptive caption, and legends may also be useful (Do you know the difference?). If you take a figure or table from an article, cite the article in the caption, for example “(from Smith et al. 2001)”. Captions should be placed below each figure, while table captions should be above the table. Number your figures and tables sequentially, rather than using the numbers from the original papers. Make your own caption. Do not use low quality copies in your paper (or in your presentation!).

As an aside, it is typical with most journal submissions (i.e., manuscripts) for tables and then figures to be placed after the reference section, or even submitted as separate files. During this same process, figure captions are written on a separate at the end of the manuscripts, while table captions are part of the actual table. The journal staff the place the tables and figures into the text during “layout”. You are essentially doing this layout step yourself to make it easier for grading and assessment, and to give you practice doing it.

By the Friday of the week prior to the last week of classes of the semester, and thus about ten days prior to finals week, turn in your paper in digital format, plus three hard copies. One copy is for grading, the other two are for evaluation by other faculty as part of our departmental assessment program. The assessment is not part of the class and will not affect your grade. Poor papers may be returned to the student for revision. Points will be deducted for papers turned in late. If you will be presenting your own research, a preapproved extension of up to one week may be allowed by the instructor in exceptional cases. Such an extension may be arranged by consultation with your mentor and the instructor, but only if the mentor considers it necessary and I agree. If you want to do this, have your mentor speak to me.

GRADING

Your grade will be based on a total of 100 points, with letter grades following the traditional =>90 % A, 89-80% B, etc., scale. The formal seminar will be worth 40 points, the paper 35 points, and critical reviews 25 (5 x 5) points. In addition, regular attendance is required (see below).

Do not presume that getting an “A” in this course is easy. It is a lot of work for the single credit. That said, we try very hard to be straightforward about requirements, and want you to do well.

Seminar presentation: Your point total will depend upon the content of your seminar and the quality of your presentation, with more weight given to the former. You may lose points if you do not properly provide Glenda with materials for the announcement of your talk, or if you fail to adequately work with your mentor.
**Paper:** You will be graded on your ability to 1) describe the research topic or problem, 2) express the hypotheses to be tested, 3) describe methods of study, results, and conclusions of the studies clearly, and 4) **demonstrate a synthetic comprehension of the topic.** Including suggestions for future research directions and methods is appropriate.

**Attendance** is expected at all class meetings and seminars. If you miss more than two required sessions without medical or emergency excuse, you will not receive credit for the course. Contact me in advance if you need to miss a scheduled activity. We will not meet every class period, but you will be responsible for attending the scheduled departmental seminars. These seminars are held at noon on selected Fridays. Scheduled seminars are posted on the bulletin boards around the halls of the third floor of the Science Building during the week of the seminar. As soon as the slate of faculty speakers has been settled, it will be distributed. Although it will not be graded, your verbal participation is important and contributes to the class. The faculty requests that speakers and audience please refrain from asking and answering preplanned questions.

**SCHEDULE**

Schedule construction will depend on guest speakers. However, it would include:

August 26: Initial meeting – review of this syllabus and course expectations.

September 2: Discussion about how to write a good paper. Turn in mentoring consent form, which has preliminary title of topic, signature of advisor, and abstract.

September 9: Discussion on how to do a good presentation. Ideally you will have begun to collect and review references. Persons presenting early in the schedule would hopefully have a presentation framework started.

Subsequent dates would largely be used for student presentations and departmental seminar speakers. The schedule would be worked around when guests (outside speakers) were available, with student presentations phased in depending on number. We may not meet some days.

December 2: Typically last day of presentations. Papers due. Senior exit surveys and instructor evaluations distributed.

December 9: Dead Week. No presentations (and thus no class) unless there are extenuating circumstances.

December 16: Finals week meeting. Materials available for return.