

## BIOL 4900 A – SENIOR SEMINAR, FALL 2009

**Instructor:** Dr. Brad Bergstrom, office 1107 BC, 333-5770/-5759, [bergstrm@valdosta.edu](mailto:bergstrm@valdosta.edu)  
Office Hours: M 3-5 (when class doesn't meet); other times by appointment

**Course Objective** (from the Undergraduate Catalog): “The capstone course in biology. This course assesses students’ abilities to research independently topics in biology, assimilate the information, and disseminate the information in an organized and understandable fashion in both written and oral forms. Besides demonstrating comprehension of their topic and competence in communication skills, students take the ETS Major Field test in biology and complete the Senior Exit Questionnaire for successful course completion.”

**“Pre- or Corequisite: completion of all required courses in the senior curriculum for the biology major.”**

<b>Grading:</b>	Outline of paper with most major references (DUE OCT. 5):	+10
	Oral (MS Powerpoint) presentation	+40
	Written Paper (DUE at PRESENTATION)	+40
	Participation in discussion	+10
	TOTAL	100 points
	Each absence from scheduled class	-10
	Failure to score 140 or higher on Major Field Test	-40
	Failure to complete Exit Questionnaire	-20

70-100 points = Satisfactory (S); 0-69 points = Unsatisfactory (U)

### **Topic: EVOLUTION**

1. Empirical field evidence of evolution by natural selection in real populations in real time
2. Group selection: evolution of the theory and current plausible models
3. Artificial selection: a current problem in applied ecology and public health
4. The evidence for sexual selection—intermale competition and female choice
5. The fossil record *in toto*: Punctuated Equilibrium or Phyletic Gradualism?
6. The current extinction crisis compared to the previous 5; have we ended evolution?
7. Evolution of the genome: is most DNA junk?
8. Gene regulation in Eukaryotes: hopeful monsters?
9. The bird origins controversy: are they really flying dinosaurs?
10. Hypotheses on the origin of vertebrates
11. Rapid chromosomal evolution in plants
12. The earliest adaptive radiations: establishing the domains of life
13. Is competitive character displacement an important evolutionary force?
14. The Cambrian Explosion
15. Origin of sex
16. Evolution on Islands
17. Parthenogenesis in vertebrates
18. Examples of pedomorphosis (retention of juvenile characteristics) in macroevolution
19. Coevolution (including examples of co-speciation) among parasites and their hosts

## Independent Literature-research Project

Your primary task in this course will be to research thoroughly the state of the art, as reflected in the current technical literature, of one well-defined question or area of evolutionary biology. You will become something of an expert on this one area, enough so that you can lucidly explain to your colleagues and visitors (as well as readers of your paper) what science currently knows about this question, and what controversies or debates exist among experts in this field. Whenever possible, I would encourage you to present evidence on both sides of a divided question and to conclude which side is more persuasive to you (this will not be applicable to all topics). You should also be able to answer good questions from the audience, which may be elicited by your presentation.

**Paper:** prepare a typed, double-spaced throughout (including tables, figure captions, and Literature Cited) manuscript of *no fewer than* 10 pages (not counting a title page or tables or figures) examining the important theories and evidence related to the research question you've chosen. It must be printed in a 12-point font *without right-justification*. Margins should be set to 1 inch on top, bottom, and right side, and 1.25 inches on left side. Page 0 (Zero) will be a title page, page 1 will begin the Introduction. As this is not original research, you will not have "Methods" or "Results" sections, so you may be creative with section Subheadings, which may be specifically tailored to your topic. You may have "Discussion" and/or "Conclusions" as your terminal text sections, followed by "Literature Cited" (the latter is required and must end no earlier than page 10). Place each section heading or subheading in Bold Font on its own line. DO NOT put extra line spaces before or after any of these sections. Following Literature Cited, you may then append (in strict order, no exceptions!), Tables (1 through n), then Figures (1-n), and in some cases, Appendix (A through Z). Put a single staple through the manuscript; no binders, no plastic.

Your Lit. Cited must have AT LEAST 10 references, and all of these must actually be cited at least once in the text of your paper (parenthetically, by Author last name and year, nothing else, at the end of a sentence or phrase citing a conclusion of that paper). At least 7 of these references must be scientific articles from peer-reviewed biological journals. If you choose to cite any Web sources, these will be IN ADDITION to the 10 required books and articles. Consult the CSE (Council of Science Editors) Style Manual and other sources on reserve for this course or in reference in Odum Library. Also, become familiar with the style and format of the journal articles you will be consulting, and try to emulate them (recognizing that there will be differences, as you are not doing original research, and you are preparing a manuscript as for review by an editorial staff, not a finished document ready for publication). More hints to come later...

**Outline:** an outline of your paper, with title, all subheadings and bullets of points to be addressed within each, along with complete citations (in proper Literature Cited format) of most of the major references you'll be using will be due Oct. 5.

**Presentation:** Toward the end of the semester, you will be assigned a half-hour time slot to present your thesis in spoken and audio-visual format to the class and any visitors. It should be prepared using PowerPoint, and should include outline-form text, organized to help you present your speech, accompanied by data in Table and/or Graph form and possibly other images (e.g. Jpegs, Quick-time movies...). Your talk MUST last between 15 and 20 minutes and have at least 10 minutes for questions and discussion.