Course objectives:
This seminar is intended to help beginning doctoral students in Ecology and Evolutionary Biology review of some of the major ecological concepts. Faculty and students will engage in weekly discussions to explore the history and the current status of the foundations of ecology as represented by E&E faculty. Students will lead discussions on selected papers from the literature and become familiar with topics related to their own research interests and prepare students to think about the research question(s) they want to pursue.

Background Reading
*Writing Science in Plain English* by Anne E. Greene, University of Chicago Press, 2013.

Evaluation:
- 10% class participation (presence, contribution, originality, enthusiasm, preparation, discussion guides, and syntheses)
- 50% final paper (Review paper, description below)
- 20% weekly paper reviews
- 20% final presentation

A >90%  B 80% - 89%  C 70% - 79%  D 60% - 69%  F <60%

Late assignment policy: 5% from the final grade for each piece of work per day late, up to 15% in total grade reduction.
Missed class policy: Unless appropriate paperwork received (e.g., doctor’s note), or previously agreed with class instructors, 5% from the final grade for class participation per absence up to 10% in total grade reduction.

COURSE ELEMENTS
1. Readings and Discussion. These discussions will be organized into topics reflecting major lines of thought in the development of ecology as a science. Early papers and recent papers will be reviewed each week. Each student will prepare summary handouts and lead one discussion. Students will make selections from: i) Early “classic” papers, e.g., taken from Real & Brown (1991); and ii) recent papers (post 2000) that are of special interest to the research areas among enrolled students. For weeks where we have guest E&E faculty members, the classic paper and discussion will be directly related to that faculty member’s research and s/he will guide our discussion.
2. Paper summaries/reviews.

**SUGGESTED TEMPLATE**

**Purpose:** The primary purpose of the weekly summaries is to help initiate discussion. Briefly highlight the main points from the article and discuss the general context and significance. Maximum length: two pages.

I. Major themes covered.

II. Stated purpose(s) or goals of the article. What questions were asked, what hypotheses were tested?

III. Significance in the historical development of the theme or topic.

IV. New contributions to the line of thought, and suggestions for new research directions.

V. Evaluation: How well did the article fulfill its stated goals? How clearly was the main message of the article presented? Did you learn something significant about the field from this article? Who cited this paper? Would you cite this article in your research? What is the author’s background? Are there any biases? How were the ideas and results illustrated?

VI. Questions for the class: List 3 or 4 questions to start the group discussion.

VII. How does the paper relate either directly or indirectly to your research area?

3. Term Paper/Research Proposal. Each student will prepare an introduction and literature review on a research topic that would be suitable for possible submission to the National Science Foundation’s Doctoral Dissertation Improvement Grants (DDIG) Program. This preparation is intended to help students organize their plans for beginning their own research. You should submit your topic along with an outline and list of potential references by Oct 1. This proposal is due **November 24**. Further experience in proposal writing will continue in another core course (BIOS 532).

4. Final review paper and presentation. You are required to present an oral presentation of your review paper project during the class period on **Dec 1 and 3**. The Oral presentation should be 15 minutes long followed by a 2-3 minute period for Q&A.

**Academic honesty:**

*Instances of academic misconduct will not be tolerated. This includes, but is not limited to:*

- **Possessing, using, or exchanging improperly acquired written or oral information in the preparation of coursework.**
- **Use of material that is wholly or substantially identical to that created or written by another individual or group.**
- **False claims of performance or work that have been submitted by a student**
**Weekly schedule (subject to change):**

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Term Paper Guidelines

Rationale:
The goal of researching and writing this review paper is to help you define a central problem to be addressed by your Master’s or Doctoral research. In doing the reading for this paper, you will undoubtedly refine its scope, but at the beginning you should have a clear structure for the paper in mind. You might think of this paper as the first chapter of a dissertation/thesis and as the background section of the research proposal that you will write next semester in BIOS 532. Thus, the review paper will cover a topic broader than the specific research problem you will address during your graduate career, but will be directly related: it will describe the generalizations, theories and unanswered questions in the broader scientific context of your own (possible) research (“possible”, because researching and writing this review paper may lead you to refocus your graduate research program). Literature reviews are often referred to as “synthesis research” (as oppose to “original research” where new data is used to address a problem) and may include formal data analyses (meta-analyses, pattern descriptors...).

What are interested in? Why should we care? How does it relate to other fields of ecology or evolution? What is already known? Unknown?

Writing science technical documents is not easy. Short sentences, language precision (i.e. not vague), conciseness, and connecting statements that link paragraphs are key components of successful scientific technical writing. You should use the advice and guidelines in Writing Science in Plain English.

Structure:
Use the Annual Review format (plant biology; ecology and systematics) as a model.

Title: Should clearly describe the central scientific problem that the Review Paper addresses

Abstract: No more than 250 words. Pose the central problem, your primary conclusions, and your recommendations for future research.

Introduction: Clearly describe the issues that the Synthesis Review Paper will address. Define the context, the central problem that needs to be addressed and the specific aspects of the focused problem that you will specifically cover in your review. This introduction will present the reader to the structure of the paper and the context and need for the synthesis.

Body: This section should be an in-depth synthesis of the literature as it relates to the central problem and its clearly demarcated components. This section should have a clear structure and logical flow, with headings and sub-headings. It should NOT be a string of summaries of the papers being reviewed and cited literature should be used to provide solutions to the problem identified in the introduction and/or to suggest lines of future research. Some papers you will refer to once, whereas others will likely be discussed at several points in your review. The use of scientific names gives authority to your writing, so their use is preferable.
**Future Research:** An extremely important section, one to which you will want to give a lot of thought. Which questions have been adequately answered; which ones need more research, and what approaches should be taken; and what new questions emerge from your review? You can use tables to structure the future research component.

**Logistical Details:**
- No more than **FIVE** single- or **EIGHT** double double-spaced pages, exclusive of References, which can be single-spaced. You should use a minimum of **25 References but no more than 35** (give attention to historical early work, conciseness, targeted examples that illustrate your point, other reviews for important related aspects not covered by your central question, etc).
- Margins: 1” all around
- Font: Times New Roman 12 pt or Calibri 11pt.
- Figures and Tables: Think about copyright issues when borrowing figures from publishers and other authors. They will not be counted within the 5 page limited. Figure and table legends should be informative to understand them without the use of the text (spell abbreviations, sources, statistics and add units if warranted).
- Citations: Numbering system as it is used in Annual Reviews. Follow Annual Reviews for the format to use in listing references (i.e. full bibliographic information, including inclusive pages and the full name of journals).
- Headings and sub-headings: Useful for organizing your paper – the structure should be clear throughout
- Editing: **Do it!!!**