This is a course in reading and writing about primary literature in the study of interactions of plants and animals. Readings in **bold** are required. Others may be mentioned in class as background (likely ones are **red** in the syllabus; rely on posted lectures for those in **red**). Find articles in **bold** with your netid and password at [http://library.uic.edu/](http://library.uic.edu/). Search under ejournals first by journal, then by author, year, volume, and/or page numbers. Lectures are posted on [http://blackboard.uic.edu/](http://blackboard.uic.edu/). No text is required, but anticipate photocopying costs if you need paper copies of class outlines and articles. An optional text is “Howe, H.F. & L.C. Westley. 1988 or 1992. *Ecological Relationships of Plants and Animals*. Oxford Univ. Press, NY.” (online, new or used). The book helps with organization, but lectures and book highlights will be posted as BookBasics I, II…n. in Blackboard. The syllabus may be updated during the semester.

**Introduction**

Jan 12-14 Paradigms, hypotheses, relevant domains and an example: *de La Peña-Domene et al. 2014*

**Herbivory**

Jan 19-21 Essay 1 Defense and offense: *D’Auria & Gershenzon 2005, Wen et al. 2006*
Feb 2-4 Synergism, biotic effects: *Rasman et al. 2011, Ostoya et al. 2013, Kohl et al. 2014*

**Mutualism**

Feb 16-18 Essay 2 Sex: *Parachnowitsch et al. 2010, Cheptou et al. 2011*
Feb 23-25 Getting along: *Riffell et al. 2013, Broi & Briggs 2013, Caughlin et al. 2015*
Mar 1 Mapping dispersal: *Jordan et al. 2007*

**MARCH 3** EXAM 100 POINTS (class, readings; open book; no laptops) lectures Jan 12-Mar 3

**Evolution**

Mar 8-10 Evolution: *Anderson & Mitchell-Olds 2011, Grillo et al. 2013*
March 21-25 SPRING BREAK

**March 29-31 Essay 3** No class: YOUR SYNTHESIS, Choice of topics on Blackboard March 27 due April 5

**Community Context**

April 5-7 Broad patterns: *Whitham et al. 2012, Rasher et al. 2013, Stam et al. 2014*
April 12-14 Nework components & implications: *Burkle et al. 2013*
April 19-21 Conservation and agriculture: *McConkey et al. 2012, Lu et al. 2010*
April 26-28 Out there: *Gilman et al. 2010, Tilman & Snell-Rood 2014*

**MAY 6 3:30-5:30** EXAM 150 POINTS (class readings; open book; no laptops) March 10 – April 30

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<tr>
<th>Exam option</th>
<th>Pts</th>
<th>Research paper option</th>
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<td>Two assigned 2-4 pages (2x50)</td>
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<td>Synthesis 8-12 pages</td>
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<td>Exam (essay, open book) March 5</td>
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<td>Major paper (review, proposal, model)</td>
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<td>Exam (essay, open book) Finals week</td>
<td>150</td>
<td>Class participation (show up and talk)</td>
<td>50**</td>
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* Research-paper option: List of 5-10 potential topics - January 26; list culled to 3 potential topics - February 2; 1 page outline of 1 essay - February 16.; final due May 6 (Optional early draft 21 April). This option is for those who want to explore something of particular interest. I collaborate in selecting relevant topics, suggesting readings, and development.

** Attends and participates regularly up to 50 pts; attends often but little participation 40 pts; irregular attendance and ontribution 30 pts; neither 0 pts. And levels of participation in between…. 
Course objectives

This course integrates basics from lecture and primary literature. The objectives are to use the scientific literature to: (1) understand mechanisms, processes and importance of plant and animal relationships; (2) explore variations in the scientific method through detailed discussion of articles from scientific journals; (3) sharpen communication skills through discussion and writing about 1st literature; (4) learn to use the 1st literature. Most of the course is thinking and writing about 1st literature or reviews written for other biologists (college students are not the intended audience). I emphasize the process of doing and interpreting science, not imparting information.

In the past I have lectured on chapters of a text (Howe & Westley 1988, 1992) for basic things that do not change (a high-crowned tooth is still a high-crowned tooth). Figures, tables and short explanations of consensus facts and interpretations from the text will be posted on Blackboard as BookBasics I, II…n.

In case you want the text for organization (the course follows a similar organization as the text) or more explanation of basics, new and used versions are available. Sometimes much cheaper used versions are available online (e.g. www.amazon.com).

Reading 1st literature.

Articles are not textbooks. There is nothing to memorize. Use the outline below to learn to quickly grasp the context, approach, and interpretations of an article, and see where the study could go and where its limitations lie. This is reading "critically." By mid-course, you should take 20-40 minutes to get the gist of any paper assigned.

I Why was the paper written? (abstract/introduction)
   What is the intellectual/theoretical context?
   What is the paper supposed to show?

II What was the approach? (methods section)
   Observation?
   design?
   Experiment?
   field? lab? whole organisms? components of organisms?
   design?
   What is the system?
   Species? Place/habitat?
   Limitations? What can the approach/design/system show? Not show?

III What were the results? (results section)
   Author's perception of results?
   What are graphs and tables supposed to say?
   What did they say?
   Skeptic's perception
   What is demonstrated beyond question?
   What is questionable?

IV What are the implications? (discussion section)
   How does the study strengthen the research area?
   How does the study change the research area?

V What is NEAT about the study? What provokes useful thought, or provides a useful example?¹
   Does the SYSTEM have anything special to offer?
   Does the APPROACH have anything special to offer?
   Do the METHODS have special promise for other studies?
   Do the RESULTS nail down important issues, or suggest new lines of investigation?
   Is the INTERPRETATION exciting, even if methods fail?

¹ As the adage goes, "Better to light a candle than curse the darkness." You can get lost in darkness-cursing if all you learn how to do is dismember the work of others. It would be a stretch to suggest that all papers in scientific journals are important contributions to knowledge. Side shows, superfluous stuff, and dead ends are the rule. But many papers that are limited in their strict application or even flawed in methods, analysis, or interpretation end up starting new lines of inquiry, or add anomalies that make old lines of inquiry untenable. Learn to enjoy the process of science, warts and all.
Articles are available on the electronic library website at http://library.uic.edu/. What is listed is a minute proportion of those accessible to you in the library. Older references, including some classics, are in the bibliography of the text. For people who want to follow up a particular set of phenomena (e.g. deceptive pollination, defense by metal accumulation) later or for a research paper, overviews in red (not required reading) are good places to start. Everyone should read papers in bold carefully. Parts of other examples of papers not in bold may be indicated in a powerpoint of a class; you are responsible only for what is used in class on the powerpoint. If a mention in class of papers not in bold is unclear, look up the title and abstract to get the drift. ALL students taking this course need to use the electronic library to acquire readings. If you don’t have access to a computer, drop the course!

Bernays, E. A. 2001. Neural limitations in phytophagous insects: implications for diet breadth and evolution of
Bernays, E. A. And Wicslo. 1994. Sensory capabilities, information processing, and resource specialization.
Bixenmann, R. J., P. D. Coley, and T. A. Kursar. 2010. Is extrafloral nectar production induced by herbivores
or ants in a tropical facultative ant–plant mutualism? Oecologia. Online first. DOI 10.1007/s00442-
010-1787-x.
Bloch, D. and A. Erhardt. 2008. Selection toward shorter flowers by butterflies whose probosces are shorter than
Bostock, RM. 2005. Signal crosstalk and induced resistance: straddling the line between cost and benefit.
Brockhurst, M.A., T. Chapman, K.C. King, J.E. Mank, S. Paterson and G.D.D. Hurst. 2014. Running with the
Brodie, J.H., O. Helmy, W. Brockelman, and J. Maron. 2009b. Bushmeat poaching reduces the seed dispersal
172:412-428.
Bruce, T.J.A. 2014. Interplay between insects and plants – dynamic and complex interactions that have coevolved
over millions of years but act in milliseconds. Journal of Experimental Botany. doi:10.1093/jxb/eru391
Brosi, B.J. and H.M. Briggs. 2013. Single pollinator species losses reduce floral fidelity and plant
13048.
146: 832–838.
Ecology 75:1635-1646.
Burkepile, D.E. and M.E. Hay. 2006. Herbivore vs. nutrient control of marine primary producers: context-
Burkle, L.A., J.C. Marlin and T.M. Knight. 2013. Plant-pollinator interactions over 120 years: loss of
Campbell, D.R. 1996. Evolution of floral traits in a hermaphroditic plant: field measurements of
15:227-231.


Emmons, L.H.. 1989. Tropical rain forests: why they have so many species and how we may lose this biodiversity without cutting a single tree. Orion 8: 8-14.


Most term papers serve student interests and are basically fun. A few go further. One on cow gut mutualists led to an epiphany for junior Erin Argyilan, who dropped plans for vet school, got a Ph.D. here, and is now a professor in Indiana. Other term papers have led to dissertations at other universities. The following are former (infinitely revised) publications that started as term papers from my UIC courses. This is an unusual outcome, but interesting.


Ken Schmidt got interested in plant defenses as components of resource quality for squirrels. The idea led to part of his dissertation.


In elite research universities this is not uncommon; graduate students are urged to, and are motivated to, develop and publish ideas they get from courses, seminars, late nights staring at the moon, or whatever. Three of my grad publications (one major, two minor) were from courses. Most of the UIC people above were grads when they first had their ideas. David Zaya was a sophomore in this course.