Entomology 601 - Fall 2013

Principles of Systematic Entomology

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Course meets MWF, 11:30-12:20, HPCT 210

Course web site: https://insects.tamu.edu/entocourses/ento601

Schedule of Lectures		
Week 1	Aug 26	1. Introduction. Course goals and procedures.
	Aug 28	2. Folk taxonomies. Historical development of systematics: Greeks through Linnaeus.
	Sept 30	3. Historical development of systematics: Darwin through the Evolutionary Synthesis. **Class discussion: Can we describe all of the species on earth?**
Week 2	Sept 2	4. Concept of the population. Population structure.
	Sept 4	5. The Neodarwinian view of species. Polytypic species and geographic differentiation.
	Sept 6	6. Homology: the central concept in comparative biology. **Class discussion: Subspecies vs. species: implications for biodiversity and conservation.**
Week 3	Sept 9	7. Character systems: morphology.
	Sept 11	8. Character systems: allozymes.
	Sept 13	9. Character systems: mitochondrial DNA. **Class discussion**: **What is the role of morphology in contemporary systematic biology?**
Week 4	Sept 16	10. Character systems: protein-coding DNA
	Sept 18	11. Character systems: ribosomal DNA.

	Sept 20	12. Character systems: microsatellites, AFLP markers, "Next Generation Sequencing", SNP's **Class discussion: Homology and molecular biology**
Week 5	Sept 23	13. Evolutionary systematics: weighting of characters.
	Sept 25	14. Phenetic methods: philosophical foundations, definition and coding of characters, measures of distance and association.
	Sept 27	15. Phenetics: clustering algorithms. Ultrametric and non-ultrametric clustering methods **Class discussion: The future of molecular systematics**
Week 6	Sept 30	16. Phenetics: Summary and critique.
	Oct 2	17. Phylogenetic systematics: philosophical foundations, terminology, cladistic evidence and hypotheses **First Midterm Examination distributed.**
	Oct 4	18. Phylogenetics: determination of character polarity. **Class discussion**: **DNA "bar-coding"**
Week 7	Oct 7	19. Phylogenetics: resolution of conflicting data, the parsimony criterion.
	Oct 9	20. Phylogenetics: tree-building algorithms. **First Midterm due by email (no later than COB, 5:00 pm).**
	Oct 11	21. Phylogenetics: Parsimony methods. **Class discussion**: **To be determined**
Week 8	Oct 14	22. Phylogenetics: Assessing the quality of data and robustness of results.
	Oct 16	23. Phylogenetics: Maximum likelihood methods.
	Oct 18	24. Phylogenetics: Bayesian methods **Class discussion: bootstrap resampling and clade support**
Week 9	Oct 21	25. Phylogenetics: Applying the results in classification, ranking of taxa, evolutionary systematics revisited.

	Oct 23	26. Phylogenetics: conclusions.
	Oct 25	27. Introduction to speciation theory, allopatric speciation. **Class discussion**: **Gene trees vs. species trees**
Week 10	Oct 28	28. Semispecies, ring species and related problems.
	Oct 30	29. Species concepts: biological, phenetic, recognition. **Second Midterm Examination distributed.**
	Nov 1	30. Parthenogenesis, species concepts in the absence of sexual reproduction. **Class discussion**: **Role of endosymbionts in insect reproductive relationships**
Week 11	Nov 4	31. Sympatric speciation and host-associated differentiation.
	Nov 6	32. A case study in speciation: the Hawaiian *Drosophila***.** **Second Midterm Examinations due (email only, by COB)**.
	Nov 8	33. Hybrid zones, species boundaries, parapatric speciation **Class discussion: host-associated differentiation**
Week 12	Nov 11	**Class cancelled, ESA meetings in Austin**
	Nov 13	**Class cancelled, ESA meetings in Austin**
	Nov 15	34. Species concepts: evolutionary, phylogenetic. **Class discussion: Species concepts**
Week 13	Nov 18	35. Zoological Nomenclature 1
	Nov 20	36. Zoological Nomenclature 2
	Nov 22	37. Zoological Nomenclature 3 **Class discussion: The future of taxonomic publication**
Week 14	Nov 25	38. Biodiversity Informatics
	Nov 27	39. Applications of systematic: study of coevolution and adaptation, the “comparative method”.

		Final Examination distributed.
	Nov 29	**Thanksgiving Holiday**
Week 15	Dec 2	**Class discussion: course critique, open discussion of any topics of interest**
	Dec 4	Reading Day. No Lecture
Friday	**Dec 6**	**Final Examinations Due electronically by 5:00 pm.**

Office Hours:

SCSE (Minnie Bell Heep Bldg.) 315 (office), 311 (lab)
Mon, Wed, Fri, 3:00-5:00 pm, or by appointment.

Readings:

There is no single assigned text for this course. We will use a variety of texts, review papers, and papers from the primary literature. I will do my best to make pdf copies of the reading available to you on the course web site well ahead of the days they are assigned (but I can't always be successful with this). Copies of Powerpoint files used in lecture will also be available on the web site.

Class Discussion:

Each **Friday** we will devote the last 20 minutes or so of class to a discussion relevant to that week's lectures. Background reading for the discussion will be posted on the course web site. Depending on how these discussions go, I may assign a different person to lead each discussion.

Examinations:

Two midterms and one final examination are scheduled as noted above. The examinations will be "take home" in format. You will have one week to complete each take-home exam. The examinations will consist primarily of essay questions, and they will require synthesis of material discussed in lecture or assigned as readings. They will be similar to the sorts of questions that many of us ask in Ph.D. written exams. I'll post exams from previous years on our web site.

Course Grading:

10% Class Participation and Discussions
25% First Examination

30% Second Examination
35% Final Examination

Remarks:

Class periods will combine lectures and discussions of the current topic. Please initiate these discussions whenever you have a question or problem with the material (someone else almost certainly does too), or whenever you have something to contribute. If you can't get my attention immediately, be persistent or noisy, that usually works. Note that 10% of the grade will be determined by participation in lecture discussions. Thus, it is to your advantage to have read the assigned materials prior to the lectures. In any case, you will find reading all of the assigned material during exam weeks to be burdensome.

Americans With Disabilities Act

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If a student believes he or she has a disability requiring an accommodation, he or she should contact the Office of Support Services for Students With Disabilities in Room 126 of the Koldus Building (845-1637) so that such accommodation can be made.

Class Attendance

Student rules governing class attendance can be found on the Texas A&M University Website, under Student Rules 2002-2003 at http://student-rules.tamu.edu/ .

Plagiarism.

As commonly defined, plagiarism consists of passing off as one's own the ideas, words, writings etc. which belong to another person. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated. Conclusive evidence of plagiarism on an exam will result in an automatic zero grade for the exam.

If you have any questions regarding plagiarism, please consult the latest issue of the *Texas A&M University Student Rules*, under the section "Scholastic Dishonesty".

Academic Integrity

"An Aggie does not lie, cheat or steal, or tolerate those that do".

Further information on the Rules and Procedures of the Honor Council can be found at http://www.tamu.edu/aggiehonor.

Campus Emergency Information

I have been asked to make you aware of the following emergency phone numbers:

Police/Fire/Medical Emergencies: Dial 911 if Off-Campus or using a cell phone, dial 9-911 if using a campus phone.
University Police, non-emergency: 979-845-2345
Poison Control: 1-800-222-1222