ANTH722: Ecological Anthropology

Spring 2017

/\/\/*SYLLABUS SUBJECT TO REVISION ***/\/\/**

Note (1/15/2017): This is the syllabus from 2016, which I am posting for your reference. The assignment dates will be adjusted for 2017 shortly.

Prof: Dr. Sean S. Downey

Class Location: Woods Hall Seminar Room (Rm. 1102)

Office Hours: Woods Hall 0113a, Thursday 10:00-11:00 (or by appointment)

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Course Description

This course is intended to provide an overview of some important approaches to ecological anthropology. We will examine populations, community ecology, political ecology, and behavioral and evolutionary ecology as they have been applied to a range of anthropological questions. We will also consider complexity theory (nonlinear dynamics) and touch upon topics in behavioral economics and game theory. My aim is to help you map the field of ecological anthropology and to assess the strengths and weaknesses of contemporary approaches, methods and theories. Along with readings, lectures and discussions, this course will expose you to some of the logic and theories that are necessary for anthropological computer modeling; however, NO mathematical or computer skills are required in this course. Note, that this seminar is required for all students in the graduate program in the Anthropology Department. There are no prerequisites, but I assume everyone has a working knowledge of "Darwinian" evolutionary theory, including concepts such as natural selection, mutation, drift, and inheritance. If not -- or if you are rusty -- an optional reading is provided during Week 1.

The course is structured as a seminar in which participants will have the opportunity to introduce the readings and lead discussion.

Learning Outcomes

Upon successful completion of the course, students will understand the following:

- How ecological theory is applied to the human species, including community ecology, optimal foraging theory, behavioral ecology, and niche construction.
- Applications of theories of natural selection, group selection, duel-inheritance theory, and neutrality to humans; with specific applications to evolution of modern diet and health.
- How complex adaptive systems theory and the concept of 'emergence' relates equilibrium-based theory.
- That the evolution of pro-social behavior and cooperation occurs among many species, not just humans.
- How theoretical origins of resilience theory developed and applications to contemporary sustainability.
- How theories regarding the relationship between global political and community-level organization can be used to understand coupled-human/nature environments.

Course Requirements

1) Read all required readings in advance of each class session. The only book that you must purchase for the course is a short book by Len Fisher (2009):

Fisher, Len. 2009. *The Perfect Swarm: The Science of Complexity in Everyday Life*. Basic Books, New York. This book can be purchased from Amazon.com at low cost:

http://www.amazon.com/Perfect-Swarm-Science-Complexity-Everyday/dp/B004LQ0ERI

All other readings, along with syllabus and related course materials, will be available from our course webpage

2) Here we carry on the ancient Oxbridge tradition of tutorial essays, amended to suit the seminar format. You will write ten short synopses (1-2 pages, double-spaced) of the key arguments in selected weekly readings over the course of the semester. These short essays are due the week that the relevant readings are discussed, and uploaded to our course website by the start of class. Late essays will not be accepted. Use footnotes and bibliographic citations. Avoid using direct quotations; accurate paraphrasing is very strongly preferred.

There are twelve weeks of content in the course (Week 1 is an introduction with no readings, so there is nothing to write) and because only ten essays are required over the entire semester, you will be able to skip two weeks. It will be wise to save at least a couple of these "free passes" for the end of the semester! Just like the airlines, weather delays are not reimbursed, so snow days are counted against your free passes. In other words, regardless of the number of snow days and when they fall, you are still required to submit 10 synopses by the end of the semester.

For each short essay, your task is to write a few paragraphs summarizing the essence of whatever arguments appear to link the assigned readings of that week. For example, if you were reading

about the Prisoner's Dilemma model, you would be expected to summarize the arguments that link this idea in game theory to real-world situations. In addition you must provide 2-3 pithy questions following (on a separate page from) your essay for discussion in class. Note that you are not being asked to critique the readings, but rather to set out the central thesis persuasively, in such a way as to highlight the strengths and possibilities of each approach. Save your critiques for our seminar discussions, and use the essays to explore the attractions of each of the approaches we will consider.

Dr. Downey will read and critique these short essays according to three criteria: (1) how well you captured the essential argument(s); (2) how clearly you expressed your understanding of the arguments (and evidence if applicable); and, (3) the thoughtfulness of the questions you raise about it. The essays will be graded on a numerical scale from 1 to 10, with "10" representing perfection. If (as will frequently be the case) the readings make several distinct arguments, summarize what strikes you as most important and interesting, but don't exceed two double-spaced pages for the entire essay.

3) Active participation in class discussions of the readings. Your contributions of pithy questions for the discussion are essential for getting a good grade. Each week, one or more students will be assigned the role of discussion leader(s). How you choose to fulfill this weighty obligation is up to you, but at the very least you should prepare a brief spoken summary and a series of "talking points" related to the specific readings for the week. Of course you can do something more elaborate, but before you prepare a 30 minute film or interpretive dance piece on the week's topic remember that the idea is to involve the whole class in the conversation. See below for further guidance on leading our discussions.

4) A final research paper, 10-15 pages in length (double-spaced) utilizing one of the theories from class, on a topic of your choice. You should discuss the topic for this final paper with Dr. Downey before you go forward with it. You are encouraged to consult with your fellow students in addition to Dr. Downey. This final assignment may take a number of forms and formats: (a) research article; **(b) a NSF-style research proposal**; or (c) a report based on a pilot study of a relevant dataset. Choose an appropriate for the type of paper you wish to write (preferably in consultation with the Professor) and please be sure to specify this on the first page of your final product. The final paper must be submitted in electronic form via the course website.

Grades

Grading: *short papers (40%) + discussion leader (10%) + participation (10%) + final project (40%) = 100%.*

Discussion Leaders

Leading discussion and maintaining the interest and engagement of your fellow students in the discussion requires preparation and planning. Here are some tips to consider.

- Introduction – In the beginning briefly introduce all five the readings to get things rolling. The goal would be to articulate the common theme or themes among them perhaps, as in this case, outlining the historical trajectory. The you can go into them in more detail and involve others in the discussion.
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- Order of readings during discussion - It is critical to present the reading in an intuitive order that reflects the main themes, as you see them. This may or may not not correspond to the order they are listed on the syllabus. Often times chronological order will work well, but this is not the only way to organize the readings.
- In general, it is helpful to use although not essential to use slides to highlight key points or themes, or to reproduce an figure or graph you felt was particularly helpful for explaining certain ideas. Regradless whether you prepare slides or just work off notes, please upload something to ELMS to get credit for presenting.
- The key is to engage your classmates in the discussion. Remember, each student has prepared their own questions based on the readings. You can involve them in the discussion by soliciting these. This will lighten the pressure on yourselves. In other words, you did not have to direct all aspects of the discussion, and instead opened it up to the student to pose their prepared questions.

Proper Citation and plagiarism

Plagiarism of any kind will not be tolerated and will result in a failing grade for the course. Provide citations for everything. Credit directly quoted and paraphrased words of others as well as sources of information. This includes internet sources as well.

If you have any questions about proper citation, please refer to the library help page or ask me:

http://www.lib.umd.edu/ues/guides/citation-tools

The UMD Code of Academic Integrity can be viewed online

http://www.president.umd.edu/policies/iii100a.html

Incompletes

Incompletes should be reserved for extreme emergencies that prevent the completion of course assignments toward the end of a school semester. It is very difficult to make up course assignments from a previous semester once a new semester begins, and students are often not able to prevent an Incomplete grade from lapsing into an F before the assigned deadline. If you think it is necessary to apply for an Incomplete grade due to an end of semester emergency, please contact the instructor immediately to arrange for a new submission date for the incomplete work and to fill out the proper paperwork. The instructor reserves the right to refuse an Incomplete grade to any student.

Late assignments

Late assignments will only be accepted under extreme circumstances, and if accepted, will be subject to point deductions at the instructor's discretion. Always alert the instructor ahead of time if you think that you may not be able to submit an assignment on time.

Special Needs

If any student has any special study or test-taking needs (e.g., test anxiety, dyslexia, poor vision or hearing, special seating requirements, etc.), please let me know as soon as possible so that we can make your participation in this course a rewarding one. In addition, I will make students aware of special services/facilities on this campus that might be of assistance in the course of your studies here at UMCP including Disability Support Services (http://www.counseling.umd.edu/DSS/) and the University Counseling Center (http://counseling.umd.edu).

Religious Observance

Effort will be made to avoid scheduling assignments with major religious holidays. However, it is the student's responsibility to inform the instructor of any intended absences for religious observances other than those listed on the UMD website in advance (http://www.faculty.umd.edu/teach/attend_student.html#religious). Prior notification via the ELMS Messaging is required by the end of the second week of class.

Copyright

All course materials (presentations, exams, handouts, labs, etc. in digital or paper format) are subject to copyright protection and may only be used for personal use. Course materials must not be distributed without permission of the instructor.

Grading Scheme

At the end of the semester your numeric grade will be converted to a letter grade using the following scheme:

A	100%	to 94%
A-	< 94%	to 90%
B+	< 90%	to 87%
B	< 87%	to 84%

B-	< 84%	to 80%
C+	< 80%	to 77%
C	< 77%	to 74%
C-	< 74%	to 70%
D+	< 70%	to 67%
D	< 67%	to 64%
D-	< 64%	to 61%
F	< 61%	to 0%

Week 1 - Introduction to Ecological Anthropology

Introductory Lecture to Ecological Anthropology (Downey)

Schedule weekly discussion leaders (decide which topics you want to present to the class and lead discussion)

Steward, J. 1955. The Patrilineal Band.

If you need a refresher on basic evolutionary theory and macroecology, here is a background reading: Lewis et al. 2013. If you've never encountered this material before, please read this carefully as this course assumes knowledge and understanding of basic evolutionary theory.

Week 1 - Course Introduction.pdf

Week 2 - Ecological Anthropology / Scale & Evolutionary Forces (Feb 4)

Discussion Leaders: Fabio, Patrick

Levin, S. 1992. The problem of pattern and scale in ecology. The Robert H. MacArthur Lecture.*Ecology* 73: 1943-1967.

Lewontin, R. 2002. *The Triple Helix: Gene, Organism, and Environment.* Cambridge, MA. Harvard University Press. Pp 41-68.

Orlove, B. 1980. Ecological Anthropology. *Annual Review of Anthropology* 9: 235-273.

Scoones, I. 1999. New Ecology and the Social Sciences: What Prospects for a Fruitful Engagement? *Annual Review of Anthropology* 28: 479-507.

Orr, Y., Lansing, J. S., & Dove, M. R. 2015. Environmental Anthropology: Systemic Perspectives. *Annual Review of Anthropology*, *44*(1).

Optional: Biersack, A. 1999. From the "New Ecology" to the new ecologies. *American Anthropologist* 101: 5-18.

Week 3 - Community Ecology / Humans & Biotic Diversity (Feb 11)

Discussion Leaders: Sarah H., Rebecca Q., Emily D.

Pianka, E. R. 1994. *Evolutionary Ecology* (Fifth Edition). New York: HarperCollins College Publishers. Ch 17 (Community and Ecosystem Ecology) and Ch 18 (Biotic Diversity and Community Stability).

Blondel, J. 2006. The 'Design' of Mediterranean Landscapes: A Millennial Story of Humans and Ecological Systems during the Historic Period. *Human Ecology* 34: 713-729.

Brown, J., et al. 2002. The fractal nature of nature: power laws, ecological complexity and biodiversity. *Philosophical Transactions of the Royal Society, London (B)* 357: 619-626.

Brown, J. H., Heske, E. J. 1990. Control of a desert-grassland transition by a keystone rodent guild. *Science* 250(4988): 1705-1707.

Williams, J. W., et al. 2005. Anthropogenic impacts upon plant species richness and net primary productivity in California. *Ecology Letters* 8: 127–137.

Week 4 - Foraging Theory: Models and Tools (Feb 18)

Discussion Leaders: Lyle, Hannah

Hawkes, K., et al. 1982. Why hunters gather: optimal foraging and the Aché of eastern Paraguay.*American Ethnologist* 9: 379-398.

Winterhalder, B. 1997. Gifts given, gifts taken: the behavioral ecology of non-market, intra-group exchange. *Journal of Archaeological Research* 5: 121-168.

Winterhalder, B. and E.A. Smith 2000. Analyzing adaptive strategies: Human behavioral ecology at twenty-five. *Evolutionary Anthropology* 9(2): 51-72.

Smith, E.A., M. Borgerhoff Mulder & K. Hill. 2001. Controversies in the evolutionary social sciences: a guide for the perplexed. *Trends in Ecology and Evolution* 16: 128-135.

Nettle, D., Gibson, M. A., Lawson, D. W., & Sear, R. (2013). Human behavioral ecology: Current research and future prospects. *Behavioral Ecology*, *24*(5), 1031-1040.

Week 5 - Behavioral Ecology and Sexual Selection Theory (Feb 25)

Discussion Leaders: Umai, Leslie

Roughgarden, J., Oishi, M., & Akçay, E. (2006, February). Reproductive social behavior: Cooperative games to replace sexual selection. *Science (New York, N.Y.)*, *311*(5763), 965-969.

Smuts, B.1995. The evolutionary origins of patriarchy. *Human Nature* 6: 1-32.

Bliege-Bird, R. 1999. Cooperation and conflict: the behavioral ecology of the sexual division of labor. *Evolutionary Anthropology* 8(2): 65-75.

Gurven, M. and K. Hill. 2009. Why Do Men Hunt? A Reevaluation of "Man the Hunter" and the

Sexual Division of Labor. *Current Anthropology* 50(1): 51-74.

Bliege-Bird, R. and D.W. Bird. 2008. Why Women Hunt: Risk and Contemporary Foraging in a Western Desert Aboriginal Community. *Current Anthropology* 49(4): 655-693.

Week 6 - Niche & Niche Construction (Mar 3)

Discussion Leaders: Sarah H., Kate

Laland, K., Uller, T., Feldman, M., Sterelny, K., Müller, G. B., Moczek, A., ... & Futuyma, D. J. (2014). Does evolutionary theory need a rethink?. *Nature*, *514*(7521), 161.

Laland, K.N., Odling-Smee, F.J. & Feldman, M.W. 2000. **Niche construction, biological evolution and cultural change.** *Behavioral and Brain Sciences* 23(1): 131-175.

Odling-Smee, F.J., Laland, K.N. & Feldman, M.W. 1996. **Niche construction**. *American Naturalist* 147(4): 641-648.

Bliege-Bird, R. et al. 2008. The "fire stick farming" hypothesis: Australian Aboriginal foraging strategies, biodiversity, and anthropogenic fire mosaics. *PNAS* 105(39).

Lansing, SJ and K Fox. 2011. Niche construction on Bali: the gods of the countryside. Philosophical Transactions of the Royal Society B: Biological Sciences 366:1566, 927-934.

**Background readings provided (optional): Chave (2004); Harte (2003); Hu et al. (2006); Pianka (1994, Ch 13 *The Ecological Niche*).

Week 7 - Dynamical systems, Selection and Neutrality (Mar 10)

Discussion Leaders: Emily C., Hannah

Gould, S.J. and R. C. Lewontin 1979. The Spandrels of San Marco and the Panglossian Paradigm: A Critique of the Adaptationist Programme. Proceedings of the Royal Society of London 205.

Kauffman, S.A. 1991. Antichaos and adaptation. *Scientific American* (August): 78-84.

Nowak, M. 2006. Finite Populations. In *Evolutionary Dynamics*, pp. 93-97.

Mitchell, M. 2009. Dynamics, chaos and prediction. In *Complexity: A Guided Tour*. Oxford University Press, pp. 15-39.

Lansing, J.S. and M. Cox. 2011. The Domain of the Replicators: Selection, Neutrality, and Cultural Evolution. *Current Anthropology* 52(1): 1-22.

Hahn, M. W. & Bentley, R. A. 2003. Drift as a mechanism for cultural change: An example from baby names. *Proceedings. Biological Sciences / the Royal Society*, *270*(Suppl 1), S120-S123.

SPRING BREAK (Mar 17)

NO CLASS - Downey at NSF (Mar 24)

Week 8 - Complex Adaptive Systems (Mar 31)

Discussion Leaders: Kate, Leslie, Fabio

Fisher, L. 2009. *The Perfect Swarm: The Science of Complexity in Everyday Life*. Basic Books, New York. (To be purchased via Amazon.com or similar source)

Holland, John. 1992. Complex Adaptive Systems. Daedalus. Vol. 121, No. 1, pp. 17-30.

Lansing J.S. and S. Downey 2011. Anthropology and Complexity. Philosophy of Complex Systems: Part VII.

Arthur. B. 2013. Complexity Economics: A Different Framework for Economic Thought. Sante Fe Institute Working Paper Series.

**Background readings provided (optional): Lansing 2003; Albert and Bárbasi (2002); Dunne et al. (2002); Levin (2003); Folke (2006).

Week 9 - Couple Human and Natural Systems (Resilience) (Apr 7)

Discussion Leaders: Sarah J., Emilia G.

Holling C.S. 2001. Understanding the Complexity of Economic, Ecological, and Social Systems. Ecosystems 4(5): 390-405.

Folke, C. (2006). Resilience: The emergence of a perspective for social--ecological systems analyses. *Global Environmental Change*, *16*(3), 253-267.

Scheffer, M., et al. 2012. Anticipating critical transitions. *Science* 338 (19 October): 344-348.

Lansing, J.S., et al. 2012. Alternate stable states in a social-ecological system. *Santa Fe Institute Papers.*

Downey, S. S. (2010). Can properties of labor-exchange networks explain the resilience of swidden agriculture? *Ecology and Society*, *15*(4).

Week 10 - Institutions, Cooperation / Group Selection (Apr 14)

Discussion Leaders: Umai, Rebecca Q.

Wilson, D.S. 1983. The group selection controversy: History and current status. *Annual Review of Ecology and Systematics* 14: 159-187.

Becker, C.D. and E. Ostrom 1995. Human ecology and resource sustainability: The importance of institutional diversity. *Annual Review of Ecology and Systematics* 26: 113-133.

Bergstrom, T.C. 2003. Evolution of social behavior: Individual and group selection. *Journal of Economic Perspectives* 16(2): 67-88.

Ostrom, E. 2003. How types of goods and property rights jointly affect collective action. *Journal of Theoretical Politics* 15(3): 239-270.

Pepper, J.W. and B.B. Smuts. 2002. A mechanism for the evolution of altruism among non-kin: Positive assortment through environmental feedback. *The American Naturalist* 160(2): 205-213.

Week 11 - Field Experiments in Behavioral Economics (Apr 21)

Discussion Leaders: Lyle, Patrick

Henrich, J., Boyd, R., Bowles, S., Camerer, C., Fehr, E., Gintis, H., et al. 2001. In search of homo economicus: Behavioral experiments in 15 small-scale societies. *American Economic Review*, 73-78.

Cardenas, J.-C. and E. Ostrom. 2004. What people bring into the game: Experiments in the field about cooperation in the commons. CAPRi Working Paper, no. 32. International Food Policy Research Institute, Washington DC. http://www.capri.cgiar.org.

Henrich J, Ensminger J, McElreath R, Barr A, Barrett C, Bolyanatz A, Cardenas JC, Gurven M, Gwako E, Henrich N, Lesorogol C, Marlowe F, Tracer D and Ziker J. 2010. Markets, Religion, Community Size, and the Evolution of Fairness and Punishment. *Science* 327(5972): 1480–1484.

Weissner, P. 2009. Experimental Games and Games of Life among the Ju/'hoan Bushmen. Current Anthropology 50:1. pp. 133-138.

Cardenas, JC,M. Janssen, and F. Bousquet. 2013. Dynamics of Rules and Resources: Three New Field Experiments on Water, Forests and Fisheries. In Handbook on Experimental Economics and the Environment", John List and Michael Price, eds. Edward Elgar Publishing.

Week 12 - Urban Ecology (Apr 28)

Discussion Leaders: Emilia G., Sarah J.

Alberti, M., et al. 2003. Integrating Humans into Ecology: Opportunities and Challenges for Studying Urban Ecosystems. *BioScience* 53(12): 1169-1179.

Grimm, N.B. and C. Redman. 2004. Approaches to the study of urban ecosystems: The case of Central Arizona—Phoenix. *Urban Ecosystems* 7: 199-213.

Wackernagel, M. et al. 2006. The Ecological Footprint of cities and regions: comparing resource availability with resource demand. *Environment and Urbanization* 18(1): 103-112.

Bettencourt, L.M.A., J. Lobo, D. Helbing, C. Kühnert, and G.B. West. 2007. Growth, innovation, scaling, and the pace of life in cities. *Proceedings of the National Academy of Sciences* 104(17): 7301-7306.

Ortman, S. G., Cabaniss, A. H., Sturm, J. O., & Bettencourt, L. M. 2014. The pre-history of urban scaling. *PloS One*, *9*(2), e87902.

Week 13 - Political Ecology: History, Concepts, Methods (May 5)

Discussion Leaders: Emily C. Emily D

Greenberg, J.B. and T.K. Park. 1994. Political Ecology. *Journal of Political Ecology* 1: 1-12.

Biersack, A. 2006. (Chapter 1). Imagining Political Ecology: Culture/Power/History/Nature. IN*Reimagining Political Ecology*. A. Biersack and J.B. Greenberg (eds). Durham, NC: Duke University Press.

Gibson, C.C., et al. 2000. The Concept of Scale and the Human Dimensions of Global Change: A Survey. *Ecological Economics* 32: 217–239.

Helmreich, Stefan. 1999. Digitizing 'Development': Balinese water temples, complexity and the politics of simulateion. Critique of Anthropology 1999 19: 249.

Lansing, SJ. 2000. Foucault and the Water Temples: A Reply to Helmreich. Critique of Anthropology, 20(3) 309–318.