

Student Directed Seminar:

(Spring 2010; Tue Thu 3.30-5.00pm(?))

Interdisciplinary Applications of Evolutionary Theory

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Abstract

Applying evolutionary thinking outside its traditional boundaries has a great potential to enhance the understanding of the world around us. This seminar will examine evolutionary theory and a successful example of its application in the humanities, evolutionary linguistics, culminating in a critical discussion of memetics and non-biological evolution. Participants will engage in an emulation of the full research process, from critical reading and analysis of academic literature, integration thereof into a research writing piece, climaxing in a presentation and peer review.

Aims and Objectives

Content objectives:

- recognise conditions resulting in evolutionary phenomena (heredity, variability, selection)
- explain the mechanisms driving evolutionary phenomena
- make predictions based on evolutionary theory

Research skills:

- Be able to follow the trail of academic thought
- Present an idea to peers coherently

Course Structure

Tuesdays: brief intro to topic (objectives, relevance, *brief* background); guest lecturer (or presentations about assigned readings/video lectures) followed by discussion

Thursdays: panel of short (15-20min) presentations by participants about main topic; followed by general discussion and a brief intro to assigned readings for next week (ie objectives, relevance, quick background)

*Tue and Thu schedules can be swapped; see course schedule

(Course becomes more flexible/discussion-based as the term goes by and more fundamentals are acquired.)

Formal project: academic literature-based research paper arguing a central thesis/model, to be presented at MURC (Multidisciplinary Undergraduate Research Conference) and submitted to UBC's peer reviewed undergraduate research journal *Road to Discovery*. The class will also feature topical presentations and discussions led by students, as well as guest lecturers.

Marking scheme:

Seminar presentation – 25% (peer reviewed)

Term project:

Proposal – 5%

Draft – 15% (peer reviewed)

MURC talk – 15% (evaluated by faculty advisor, invited faculty, and peer review)

Final paper for URO journal – 20%

Reflective journal [blog] entries – 15% (participation-based)

Mock 'grant proposal' – 5%

		Week	Tue	Thu	Readings/Assignments
		1 - Introduction	- Intro to diversity (biol, ling, cultural) - Course structure + evaluation - Policies, etc	- Science and the scientific method (how do we know something, testability, etc) *Guest lecturer? Other source? - Introduce term project	<i>The Selfish Gene</i> chapter on replicators Sagan – <i>Demon Haunted World</i> (2 chapters on nature of science) Other intro to evol material?
		2 – Fundamentals of biological evolution	Lecture: Greg Bole - units of selection, replicators,	Nature + limitations of mathematical modeling in evolution (contact Sally Otto)	Andrews Thomson 2009 <i>Psych Rev</i> ‘depression is adaptive’ (to discuss Thu) Something on phylogenies/lack of directionality?
		3 – Mechanisms of biological evolution I – phylogenetic thinking	Phylogenies – understanding that life is not a ladder; lack of directionality in evol - lineages + speciation	[hyper]adaptationism. (paper reading and discussion)	Lynch 2007 <i>PNAS</i> (following Thu discussion) Short LGT review?
Proposal due	Return proposals	4 – Mechanisms of biological evolution II – neutral evol	Constructive Neutral Evolution Defining complexity	LGT, horizontal inheritance (student-led seminars) Paper discussion	Papers depending on participant choice of topic
		5 – Misc topics in evolutionary biology	Evolution of sex Lecture: Rosie Redfield	Misc topics: Evol of multicellularity? What is an organism? (student-led seminars)	<working on MURC talk>
2wk break: Drafts due		6 - Introduction to linguistics	Compare evol in asexual life Diversity and commonalities of languages (student seminars?)	MURC PRACTICE Midterm course evaluations	Excerpt of Pinker’s <i>The Language Instinct</i> (or <i>The Stuff of Thought</i>)
		7 - Language fundamentals and acquisition	MURC PRACTICE (Or psycholing: what language is)	Language transmission/lang acquisition creoles/pidgins	- Excerpt of Kenneally 2007 <i>The First Word</i> Ling evol paper: S Kirby; 2009 <i>Nature Rev Genet</i> (optional)
MURC		8 - Historical and evolutionary linguistics, evolution of language capacity	Historical Linguistics Lecture: Gunnar Olafur Hansson Exploring how lang evol happens (incl areal ling)	Open to participants (student-led seminars)	Dan Dennett: ants, terrorism and memes (TED talk) Richerson & Boyd 2005 <i>Not by genes alone</i> : “Nothing about culture makes sense except in the light of evolution”
		Week 9 – Evolution in linguistics and biology Intro to cultural evolution	Compare/contrast biol and ling evol systems (student-led discussion)	Replicator revisited, how to apply to culture - what is culture (Student-led discussion) or: Lecture by Edward Slingerland?	(Optional: Dawkins 1976 meme chapter) Dennett 2009 <i>PNAS</i> (or Cold Spring Harbour Symposia... paper) Atran 2002 Trouble w memes
		Week 10- Mechanisms of cultural evolution	Cultural transmission – parallels/differences w biol systems	Folklore and culture Lecture: Adheesh Sathaye	Henrich et al. 2008
		Week 11	Open to participants Or: Lecture by Ara Norenzayan? (evolution of religion)	Open to participants	
Final paper due		Week 12	Open to participants	Conclusion, evaluations	