

Instructor: Dr. Anthony Fiumera  
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Office: S3 104  
Phone: 7-3474  
Office hours: Friday 9-10 (or by appointment)

Course Meets in S3 214  
Tuesday and Thursday 11:40 to 1:05

Instructor: Dr. Tom Powell  
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Office: S3 112  
Phone: 7-4439  
Office hours: Tuesday 2-3 (or by appointment)

### Learning Objectives

- Gain a strong background in evolutionary theory
- Become comfortable navigating the scientific literature independently
- Improve scientific writing skills
- Develop and critically review scientific experiments to test specific hypotheses
- Develop quantitative and problem solving skills
- Learn to apply statistical procedures to the analysis of biological data
- Gain an appreciation for 'what graduate school is all about'

### Proposed Course Format

- This course is a lecture/discussion course. Some days will be a 1.5 hour lecture and the following class we will discuss one or more related papers.
- We will use MyCourses for all announcements, required and supplementary readings, and posting grades

### Suggested Text

1. Primer of Ecological Genetics by Conner and Hartl (2004, Sinauer)  
<http://www.sinauer.com/a-primer-of-ecological-genetics.html>  
Available for rental through Barnes & Noble

### Grading

#### 20% REVIEW PAPER

This will be a review article on a topic of your choosing (pending approval) and is to be written in the format of Trends in Ecology and Evolution (TREE).

#### 10% CRITIQUE OF ANOTHER STUDENTS REVIEW PAPER

You will act as a reviewer of another student's 'submission'. You will need to provide a thorough and professional review, with the goal of helping the student improve their submission.

#### 20% REVISION OF REVIEW PAPER (REVISED VERSION)

This will be a revised version of the submission taking into account the reviewer's and editor's (my) comments. A detailed response to the comments will be required along with the revised version.

#### 25% WEEKLY PAPER SUMMARIES (1-2 pages long)

You will be required to critique one paper of your choice in addition to the required readings. This will be due on Thursday. This needs to be primary literature (not a review paper). You will need to 'answer' the questions posed on the 'how to read a scientific paper'. We expect this to summarize the paper and make meaningful comments on what is good about the paper and what could be improved or followed up on.

#### 5% HOMEWORKS (references and paper topic approval included here)

#### 20% PARTICIPATION

You are required to submit 2 questions about each required reading for class discussions. The questions need to be submitted via email to that week's instructor the night before the discussion (typically Wednesday night). They need to be in our inboxes by the time we check our email Thursday morning. The questions will be compiled and brought to class for the discussion. These need to be thoughtful questions, not simply "I wonder why they did X?". Think in terms of questions that can lead to fruitful discussion rather than straightforward answers.

We expect each of you to be intellectually engaged with the material and to actively contribute to the discussions each week.

## Course Policies

*Official BU policy of credit hours and work expectations-* This course is a 4-credit course, which means that students are expected to do at least 12 - 13 hours of course-related work or activity each week during the semester. This includes scheduled class lecture/discussion meeting times as well as time spent completing assigned readings, preparing for discussions, and completing assignments. Please note that in order to be successful in this course, you will need to devote a substantial amount of time to developing your review paper.

*Disability-related Equal Access Accommodations* – Students needing accommodations to ensure their equitable access and participation in this course should notify the instructor with an Academic Accommodation Authorization from Binghamton University's Services for Students with Disabilities (SSD) office as soon as they're aware of their need for such arrangements. Please visit the SSD website ([www.binghamton.edu/ssd](http://www.binghamton.edu/ssd)) for more detailed information. The office is located in University Union, 119.

*Academic Dishonesty-* I fully expect each of you to abide by the University's *Student Academic Honesty Code* (follow link on <https://www.binghamton.edu/harpur/faculty/acad-honesty.html>) in all of your work connected with this course. Please note that I reserve the right to use plagiarism detection software on any material you turn in. Any infractions will be reported to the Harpur College Academic Honesty Committee and will result in a grade of zero for the assignment.

*Dealing with stress and difficulties this semester* – Grad school can be very stressful. If during this semester, you find yourself undue personal or academic stress – please reach out for support. The people at this university, myself included, really want you to succeed and care about your well-being. Please don't hesitate to talk to me about any issues that may affect your work in my class. Additionally, I am more than happy to help you in reaching out to any one of a wide variety of campus resources.

Month	Day	Date	Leader	Assignments	Topics	Readings
AUG	R	24	THQP		Intro	
AUG	T	29	THQP		LEC: Pop Genetics	C&H 1,2
AUG	R	31	THQP	SUMMARY	Discussion – how do we know when something is “adaptive?”	<b>Gould &amp; Lewontin 1979</b> ; Neilsen 2009; <b>Barret and Hoekstra 2011</b>
SEP	T	5	THQP	<b>PAPER TOPIC DUE</b>	LEC: Pop Gen II & Quantitative Genetics I	C&H 3-4
SEP	R	7	THQP	SUMMARY	Discussion	<b>Schemske &amp; Bierzychudek 2007</b> ; <b>Watt et al. 2003</b> ; Wright 1943
SEP	T	12	THQP		LEC: Quantitative Genetic II & Molecular markers	C&H 5
SEP	R	14	THQP	SUMMARY	Discussion	<b>Weber et al. 2013</b> ; <b>Rockman 2011</b> ; Buckler et al. 2009
SEP	T	19	THQP	<b>30 REFERENCES</b>	LEC: measuring natural selection	C&H 6
SEP	R	21			NO CLASS	
SEP	T	26	THQP		LEC: Molecular Evolution	<b>Martin et al. 2012</b> ; TBD
SEP	R	28	THQP	SUMMARY	Discussion	<b>Siepielksi &amp; Benkman 2007</b> ; Weis & Gorman 1990; Lande & Arnold 1983
OCT	T	3	THQP		LEC: Phylogenetics/Comparative methods	TBD
OCT	R	5	THQP	SUMMARY	Discussion	<b>TBD</b>
OCT	T	10	THQP	<b>PAPER DUE</b>	LEC: Species/Speciation	Coyne & Orr 1989; TBD
OCT	R	12	THQP	SUMMARY	Species/Speciation	Reisch et al. 2017; Hopkins & Rausher 2012
OCT	T	17			NO CLASS	
OCT	R	19	THQP	<b>CRITIQUE DUE</b>	Discussion	Weir & Schluter 2009, TBD
OCT	T	24	ACF		LEC: life history evolution	

OCT	R	26	ACF		Discussion	Zera2001, <b>Heath et al. 2003</b> , <b>comments, response</b>
OCT	T	31	ACF		LEC: Multilevel Selection	
NOV	R	2	ACF		Discussion	<b>Nowak 2010 and responses</b> ; lots of others
NOV	T	7	ACF		LEC: Cost/Benefits of Sex	
NOV	R	9	ACF		Discussion <b>EDITORS DECISION</b>	<b>Goddard 2005</b> ; Agrawal; Otto
NOV	T	14	ACF		LEC: Pre-Post Copulatory Selection	
NOV	R	16	ACF	SUMMARY	Discussion	<b>Qvarnstrom2006</b> ; Kruuk 2005; Kokko
NOV	T	21			LEC: Sexual Conflict	
NOV	R	23			NO CLASS	
NOV	T	28	ACF	QUESTIONS	Discussion	<b>Mank 2009</b> ; Rice 1984, Boundiaransky 2009 ; Gallach 2011
NOV	R	30	ACF	SUMMARY	Parent-Offspring Conflict	
DEC	T	5	ACF	QUESTIONS	Discussion	<b>Kolliker 2000</b> , Kolliker 2001, Royle 2015, Wells 2203
DEC	R	7		<b>PAPER REVISION WITH RESPONSE</b>		

THIS IS ONLY A PARTIAL DRAFT OF THE SYLLABUS. IT WILL CHANGE

Papers underlined and in bold will be the focus of the discussion. They are the required readings. The other papers may help in understanding but are not "required".