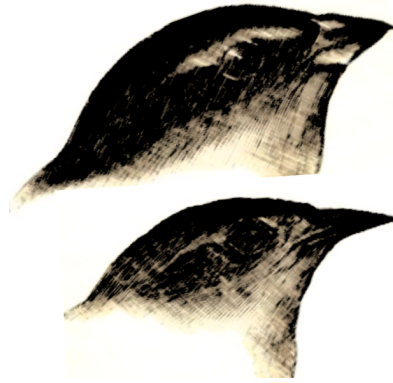


SYLLABUS

SPECIATION GENETICS
VIBS/EEBL/GENE 689, section 600
FALL 2018

INSTRUCTOR: Dr. Vaishali Katju,
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Office Hours: Mondays, 1-2 pm (or by appointment)



DAYS, TIME AND LOCATION:
Tuesdays and Thursdays, 11:10 am – 12:25 pm
VIDI 127

GENERAL COURSE OBJECTIVE AND SCOPE:

The purpose of this course is to provide graduate-level students with an introduction to the one of the most fundamental processes in populations and living systems, namely the ability to speciate into biologically diverse forms via microevolutionary processes. In this course, we will review the literature on the origin of species beginning with Darwin and continuing through contemporary work. The course aims to provide an overview of several major topics in speciation with special emphasis on the genetics of speciation in this genomic era.

This course uses a combinatorial approach of formal lectures, student-led short presentations on assigned readings from the primary literatures and seminar-style discussions. Following lecture delivery, a short presentation of the assigned readings from the primary literature will be led individually by two students but all students are expected to fully participate in the discussion thereafter. This course has an extremely heavy reading component comprising both text chapters from Coyne and Orr (2004) as well as readings from the primary literature. All students are required to read the assigned material prior to each class. There are no midterms or final exams but a term paper is due in the last week of classes.

Students are strongly encouraged to ask questions. But students also need to come prepared to the class, both by reading the assigned material and also devoting careful thought to it. This is a graduate-level course and in order to draw out participation, students may be called on to explain key concepts from the readings to the remainder of the class.

PREREQUISITES:

GENE 603 Genetics (or equivalent)
BIOL 610 Evolution (or equivalent)

A basic knowledge of evolution and genetics is assumed. Students are expected to be familiar with the basic concepts of the textbook *Evolutionary Biology* (Third Edition) by Douglas Futuyma. If you have not taken a course in Evolution, you should read Chapters 15 and 16 of this book immediately. Both chapters will be provided as pdf files.

TEXTBOOK (REQUIRED):

Primary Text:

Coyne, J.A., and Orr, H.A. 2004, *Speciation*, Sinauer Press, Sunderland, MA.

ATTENDANCE AND GRADING POLICIES:

Class attendance is deemed essential and mandatory for this course. While some component of the class time is assigned to lectures, the remaining time is used for accomplishing class goals via journal club and seminar-style discussions, student-led presentations and active participation by students in the audience. Repeated class absence will influence the grade fraction set aside for participation as well as submitted article summaries which are due at the beginning of the lecture, unless an explanation and documentation of extenuating circumstances of absence are provided. If the student is seeking an excused absence, “the student must notify his or her instructor in writing (acknowledged e-mail message is acceptable) prior to the date of absence if such notification is feasible.” If prior notification is not possible (e.g., emergency), “the student must provide notification by the end of the second working day after the absence.” Please refer to university-approved excuses for missed deadlines as described in the TAMU Student Rules and found at: <http://student-rules.tamu.edu/rule07>.

Therefore, students are VERY STRONGLY ADVISED to attend all lectures.

All assignments should be received by their posted deadlines in order to receive full credit.

Assignments submitted past the deadline will only be considered for credit under extenuating circumstances (accident, illness or emergency) with permission from the Instructor. Please refer to University Rules (<http://student.rules.tamu.edu>) for further explanation.

GRADING SCALE:

- A = 90-100
- B = 80-89
- C = 70-79
- D = 60-69
- F = 0-59

COURSE BREAKDOWN:

<u>Item</u>	<u>% of course grade</u>
One-page summaries of assigned articles from the primary literature	20%
Student-led group discussion	20%
Participation in discussion of primary literature	20%
Term Paper	40%

STUDENT-LED GROUP DISCUSSION ON ASSIGNED READING FROM THE PRIMARY LITERATURE:

Commencing in the third week, one or two students will lead a discussion on class topics of the week. The designated students will be assigned a paper from the primary literature on the topic being discussed. These papers will form the basis of a general discussion and will be e-mailed out as pdf files to the entire class a week in advance. There may be some weeks where we will be time-pressed to cover lecture material, and primary literature papers may be assigned for writing summaries, but class time may not be devoted to journal club/group discussion.

When leading a discussion, students should prepare an overview of the specific paper from the primary literature that have been assigned to them. This overview should include an outline of the key points, tables or illustrations, a bibliography of the relevant papers, and a list of questions to

generate discussion in powerpoint format. The lead student will present the salient points of the assigned paper for 15 minutes, followed by 20 minutes of discussion by the entire class in journal club style.

ONE-PAGE SUMMARIES OF ARTICLES FROM PRIMARY LITERATURE:

To facilitate discussion, all students are required to turn in a one-page summary for each assigned article per lecture. The summary document will be sent you electronically in the first week of class. Please save it and use it for submission of all reading summaries through the length of the semester. These should be typed and printed out and turned in at the *beginning* of the class (please do NOT send these to me electronically).

These summaries should describe the following:

- The main question being addressed?
- What the authors did?
- What the authors found?
- The significance of the findings.
- Two or three questions for further discussion.

TERM PAPER:

Each student will write a term paper reviewing an important topic in speciation, a printed copy of which is due to the Instructor at the beginning of the last day of class, December 4th. I will assign three to four review topics within the first two weeks of class. Each student must select one topic and convey their topic selection to me at the earliest, but no later than October 2nd, 2018. Students are also encouraged to decide on a review topic of their own choice but must consult me regards its feasibility and get my permission to pursue the topic before proceeding. The main body of the term paper (excluding bibliography) must adhere to a single-spaced six-page limit or less, font size 12.

STUDENTS WITH DISABILITIES:

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 you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit <http://disability.tamu.edu>.

PLAGIARISM:

As commonly defined, plagiarism consists of representing as one's own the ideas, words, writings, etc., which belong to another. It is theft, plain and simple. 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. You are committing plagiarism if you quote or very nearly quote someone else's work in a paper or presentation without acknowledging the source of the words, tables, figures, etc. Plagiarism is one of the worst academic sins, for the plagiarist destroys trust among colleagues, without which research cannot be safely communicated. BASIC RULE: if the information is not common knowledge and comes from someone else, indicate this by citing the reference (as in a scientific paper) or, if using someone else's words, quote the passage and cite the

source. If you have any questions regarding plagiarism, please consult the latest issue of the Aggie Honor System rules at <http://aggiehonor.tamu.edu/>.

COPYRIGHT STATEMENT:

The materials used in this course are copyrighted. These materials include but are not limited to syllabi, exams, additional problems, in-class materials, review sheets, and additional problem sets. Because these materials are copyrighted, you do not have the right to copy or distribute the class handouts and/or materials posted on the course website, unless permission is expressly granted by the instructor.

ACADEMIC MISCONDUCT STATEMENT:

Academic honesty is the foundation upon which a university is based. No matter how high your GPA or how preeminent the results of your research, all can be destroyed if a student or professor demonstrates dishonesty and a lack of integrity. Texas A&M University has identified academic honesty as an Aggie tradition that needs to be reemphasized. Remember, Aggies do not lie, cheat, or steal, nor do they tolerate those who do. Instances of scholastic dishonesty will be treated in accordance with Section 20 of the TAMU Student Rules. Please inform yourself on the student rules regarding cheating, plagiarism, fabrication of information, and conspiracy at the website <http://student-rules.tamu.edu/rule20>. Ignorance of rules, regulations, or policies will not be accepted as an excuse for scholastic dishonesty.

Schedule of classes (Abbreviated version)

Note: As the instructor, I will try to adhere to this schedule, but we may cover topics faster or slower than anticipated as this is the first time this course is being taught at TAMU.

<i>Lecture #</i>	<i>Date</i>	<i>Topic</i>	<i>Required Reading</i>
1	Aug 28, Tues	<i>Overview lecture part 1: History, major themes and players, key concepts & methods</i>	
2	Aug 30, Thurs	<i>Overview lecture part 2: History, major themes and players, key concepts & methods</i>	
3	Sept 4, Tues	<i>Species Concepts and Definitions</i>	Coyne & Orr, Ch. 1
4	Sept 6, Thurs	<i>Species Concepts and Definitions</i>	
5	Sept 11, Tues	<i>Studying Speciation</i>	Coyne & Orr, Ch. 2
6	Sept 13, Thurs	<i>Studying Speciation</i>	
7	Sept 18, Tues	<i>Allopatric Speciation</i> – Peripatric and Vicariant	Coyne & Orr, Ch. 3 pp. 83–111
8	Sept 20, Thurs	<i>Allopatric Speciation</i> – Peripatric and Vicariant	
9	Sept 25, Tues	<i>Parapatric Speciation</i>	Coyne & Orr, Ch. 3 pp. 111–124
10	Sept 27, Thurs	<i>Parapatric Speciation</i>	
11	Oct 2, Tues	<i>Sympatric Speciation</i> TOPIC OF TERM PAPER DUE	Coyne & Orr, Ch. 4
12	Oct 4, Thurs	<i>Sympatric Speciation</i>	
13	Oct 9, Tues	<i>Ecological Prezygotic Isolation</i> – Habitat, Pollinator & Temporal	Coyne & Orr, Ch. 5
14	Oct 11, Thurs	<i>Ecological Prezygotic Isolation</i> – Habitat, Pollinator & Temporal	
15	Oct 16, Tues	<i>Nonecological Prezygotic Isolation</i> – Behavioral and Mechanical	Coyne & Orr, Ch. 6
16	Oct 18, Thurs	<i>Nonecological Prezygotic Isolation</i> – Behavioral and Mechanical	
17	Oct 23, Tues	<i>Postzygotic Isolation</i>	Coyne & Orr, Ch. 7
18	Oct 25, Thurs	<i>Postzygotic Isolation</i>	
19	Oct 30, Tues	<i>Genetics of Postzygotic Isolation</i>	Coyne & Orr, Ch. 8
20	Nov 1, Thurs	<i>Genetics of Postzygotic Isolation</i>	
	Nov 6, Tues	NO CLASS – Penn State University trip -----	
	Nov 8, Thurs	NO CLASS – Penn State University trip -----	
21	Nov 13, Tues	Guest speaker, Dr. Leif Andersson	
22	Nov 15, Thurs	<i>Polyploidy and Hybrid Speciation</i>	Coyne & Orr, Ch. 9
23	Nov 20, Tues	<i>Reinforcement</i>	Coyne & Orr, Ch. 10
	Nov 22, Thurs	NO CLASS – Thanksgiving Break -----	
24	Nov 27, Tues	<i>Selection versus Drift</i>	Coyne & Orr, Ch. 11
25	Nov 29, Thurs	<i>Selection versus Drift</i>	
26	Dec 4	<i>Rates of Speciation</i> TERM PAPER DUE	Coyne & Orr, Ch. 12