EEEB G6110: FUNDAMENTALS OF EVOLUTION

Department: Ecology, Evolution, and Environmental Biology (E3B)
Term: Fall 2019
Instructors: Deren Eaton (de2356@columbia.edu) and Joel Cracraft (jlc@amnh.org)
Teaching Assistant: Natalie Niepoth (natalie.niepoth@columbia.edu)
Location: Schermerhorn Extension 1015
Time: Tu and Th 11:00am - 12:50pm.
Course level: 6000 (graduate but open to advanced undergraduates with permission.)
Office hours: Fridays 4-5pm in Schermerhorn Extension 1015

Goals: By the end of the course you will have (1) increased your familiarity with evolutionary theory and the research practices in this field; and (2) explored the links between evolution and other related biological and societal issues.

Format: Each session will include a mixture of lecture, discussion, and occasional in-class exercises, quizzes or exams. In addition to class time you should expect to dedicate at least 4 hours per week to reading.

Reading: There will be readings assigned from published articles as well as from the *required textbook*: Futuyma, D. and Kirkpratrick, M. (2017) Evolution (Fourth edition). Sinauer Associates, Inc. Assigned articles will be posted to Canvas each week. Assigned chapters from the textbook are listed on the syllabus. All assigned readings may be used in quizzes or exams.

Grading: Grades will be based on participation (attendance and in-class discussions), quizzes, assignments, and two exams. Quizzes will take place at the beginning of classes to assess comprehension of reading assignments. There will be no opportunities for extra credit. Missed quizzes can only be made up if absence is excused by written permission.

50% (10 assignments)
10% (participation)
10% (in-class quizzes)
15% (midterm)
15% (final exam)

Attendance policy: The course relies upon student participation in class and thus, attendance is expected. Absences will incur a grade penalty. Students who are unable to attend class for health or other personal reasons should reach out to the instructors.

Statement on policy for students with disabilities:
If you are a student with a disability and have a Disability Services-certified 'Accommodation Letter' please contact the instructors before the course starts to confirm your accommodation needs. If you believe that you might have a disability that requires accommodation, you should

contact Disability Services at 212-854-2388 and disability@columbia.edu.

Statement of academic integrity: Academic dishonesty is a serious offense and will not be tolerated in the class. Students are expected to reference sources appropriately in any work, including reference to third party software tools used in assignments or projects. Students are allowed to discuss homework assignments but should respond to questions and tasks on their own, not using a group answer. Violation of the rules of academic integrity (e.g., plagiarizing materials) from Columbia College or the Graduate School of Arts and Sciences, will result in automatic failure of the course. Rules and consequences are outlined in Columbia College's Faculty Statement on Academic Integrity:
http://www.college.columbia.edu/faculty/resourcesforinstructors/academicintegrity/statement

Schedule:

Date	Session	Weekday	Topic	Assignment	Reading: textbook
9/3/2019	**1**	T	The importance of evolutionary research		1
9/5/2019	**2**	Th	History and diversity of life		2, 17
9/10/2019	**3**	T	Tree thinking and intro to lab		16
9/12/2019	**4**	Th	Phylogenetic inference: introduction	Assignment 1	
9/17/2019	**5**	T	Markov models and historical inference		
9/19/2019	**6**	Th	Phylogenetic inference: advanced	Assignment 2	4
9/24/2019	**7**	T	The genome: structure, genes, inheritance		14
9/26/2019	**8**	Th	The genome: expression, development, variation	Assignment 3	15
10/1/2019	**9**	T	Population genetics: HW, drift, migration, selection.		7
10/3/2019	**10**	Th	Population genetics: pop genomics lab	Assignment 4	
10/8/2019	**11**	T	Population genomics: Coalescent		
10/10/2019	**12**	Th	Population genomics: Coalescent sim lab	Assignment 5	
10/15/2019	**13**	T	Review Session		
10/17/2019	**14**	Th	MIDTERM		

10/22/2019	**15**	T	Selection and Adaptation:		3, 5
10/24/2019	**16**	Th	Selection and Adaptation: Levels, Convergence	Assignment 6	6
10/29/2019	**17**	T	Speciation: history, terminology, genetics		9
10/31/2019	**18**	Th	Speciation: reinforcement, ecological, genomics	Assignment 7	
11/5/2019	--	T	NO CLASS - ELECTION DAY		
11/7/2019	**19**	Th	Diversification analyses with lab	Assignment 8	18
11/12/2019	**20**	T	Co-Evolution: ...		
11/14/2019	**21**	Th	Sexual selection		
11/19/2019	**22**	T	Macroevolution: species selection,		20
11/21/2019	**23**	Th	Macroevolution: species selection,	Assignment 9	
11/26/2019	**24**	T	Human evolution:		13
11/28/2019	--	Th	NO CLASS - THANKSGIVING BREAK		
12/3/2019	**25**	T	Human evolution:	Assignment 10	21
12/5/2019	**26**	Th	Review Session		
12/10/2019	--		NO CLASS - READING WEEK		
12/12/2019	--		NO CLASS - READING WEEK		
12/17/2019	**27**		FINAL EXAM		