

# IB 302: Evolution – Course Syllabus

## Spring 2020

### Instructors

Dr. Julian Catchen (Professor)  
jcatchen@illinois.edu  
233B Morrill Hall  
Office Hours: Tuesday, 3-4PM or by appt.

Dr. Charles Roseman (Professor)  
croseman@illinois.edu  
203 Shelford Vivarium  
Office Hours: Wednesday 10-11AM or by appt.

Dr. Lily Arias (Lab Coordinator)  
larias@illinois.edu  
3010 Natural History Building  
Office Hours: By appt.

Angel Rivera-Colòn (Course Coordinator)  
angelgr2@illinois.edu  
233 Morrill Hall  
Office Hours: By appt.

### Course Information

**Course website:** <https://learn.illinois.edu/course/view.php>

**Lecture Time & Location:** 12-12:50PM MWF, 100 Gregory Hall

**Credit:** 4 hours

**Prerequisites:** IB150, MCB150, IB204

### Communications

If you have questions on course logistics, planned absences, homework or exam questions, please contact the Course Coordinator (Angel Rivera-Colòn). If you have questions regarding the labs or lab assignments, first contact your lab TA, and if that does not resolve your question/issue, contact our Lab Coordinator (Dr. Lily Arias).

### Required Texts and Materials

1. ***Evolutionary Analysis, Fifth Edition, Jon C. Herron, Scott Freeman, and Benjamin Cummings***
  - (a) Physical copies are available at the University Bookstore.
  - (b) E-Textbook: <http://www.coursesmart.com/evolutionary-analysis-fifth-edition/jon-c-herron-scott-freeman/dp/9780321706966>
2. Lab Manual Online in Moodle (updated each week with the next weeks lab)

### Introduction to IB302

“Nothing in biology makes sense except in light of evolution” – T. Dobzhansky.

Welcome to Evolution! Evolution is the unifying concept of biological science. Most people are familiar with evolution as the subject of controversy in elementary and high school education. In reality, evolutionary ideas link all the different fields of biology.

This course is a broad introduction to evolutionary biology, including natural selection and microevolution, phylogeny, speciation, molecular evolution, macroevolution and the fossil records. The laboratory emphasizes a survey of biodiversity and processes and patterns of evolution.

## Student Learning Outcomes

1. Students learn how evolution is the central theoretical explanation for all of life, for all its diversity of form and function.
2. Students learn that evolution is a significant part of understanding who we are as humans.
3. Students learn practical skills like constructing phylogenetic trees (used in understanding the great diversity of medically important bacteria and viruses), calculating the statistics of genetic differences between populations (used in medical genetics), and calculating genetic relatedness of individuals (used in forensics).

## Course Structure

IB302 is a four-hour credit course and it therefore has both lecture and lab components. The lecture component will comprise 70% of your final grade, and the laboratory component will comprise 30%. You should expect to spend 9 hours per week outside of class working on course and lab materials.

Course Component	Points	Percent
Exam 1	150	15%
Exam 2	150	15%
Exam 3	150	15%
Participation	250	25%
Labs	300	30%
<b>Course Total</b>	1000	

### Participation

Component	Points	Percent
Homework Assignments	132	13.2%
In-class Participation	118	11.8%
<b>Participation Total</b>	250	25%

### Labs

Week	Lab	Points	Percent
Week 2	Lab 1	25	8.3%
Week 3	Lab 2	25	8.3%
Week 4	Lab 3	25	8.3%
Week 5	Lab 4	25	8.3%
Week 6	Lab 5	25	8.3%
Week 7	Lab 6	25	8.3%
Week 8	Lab 7	25	8.3%
Week 9	Lab 8	25	8.3%
Week 10	Lab 9	25	8.3%
Week 11	Lab 10	25	8.3%
Week 12	Lab 11	25	8.3%
Week 13	Lab 12	25	8.3%
<b>Lab Total</b>		300	30%

## Labs

There will be 12 weekly labs, each is worth 25 points. If you miss a lab, you may attend another lab section during the same week, at the discretion of the TA in charge of the section. Labs will not be accepted once the due date has passed without an excused absence.

## Homeworks

There will be 12 weekly homeworks on Moodle. Each is worth 12 points and we will drop your lowest grade. Late homeworks will not be accepted.

## In-class Participation

Every lecture there will be one or more iClicker questions. Students are responsible for bringing a working iClicker to class. Each individual class with an iClicker question will provide 2 points toward the participation grade. *If a student is found using an iClicker of another student or misusing the iClicker system it will be considered a violation of Academic Integrity.*

In addition, at least once a week we will supply class time for in-class assignments. For these assignments, you will work in groups, based on your lab section, and you will turn in the in-class work which will be worth 4 points per assignment toward the participation grade.

If a student were to complete all in-class assignments (iClicker and group work), they would earn 136 total points. However, the participation grade maxes out at 118 points, so it is possible to miss a few participation assignments without affecting your grade. **This means it is not possible to make up participation points if missed, whether or not a particular absence is excused.**

## Exams

You must take all three exams. If you have a known conflict, you must notify the instructor in advance. If you have an unavoidable medical or personal emergency, then you may take a make-up exam given the absence is properly documented (see below). Exams will cover lecture material, assigned readings, and material covered in labs, homework and recommended problems. You may bring basic scientific calculators (no smart phones or other computers) to exams. You should make certain that you can perform all required calculations on it. Calculators may be used only to perform calculations. Storing formulae or notes in a calculator is a violation of Academic Integrity.

## Expectations of Students

We are all expected to

1. Come to class (lecture and lab).
2. Read the textbook before each lecture. Read the lab manual and reading for discussion before each lab.
3. Complete the weekly homework assignment online (similar questions will be on exams).

## No Screen Policy

Screens (laptops, tablets, phones, etc.) are not permitted for use during lecture. Calculators are allowed for in-class activities, quizzes, and exams. If you must take or make a call during lecture you must excuse yourself from the room. Students using the above mentioned devices during lecture will first be asked to put it away, then asked to leave after subsequent violations; any missed points will not be allowed to be made up and will not be pro-rated.

## Absences

Attendance in lecture, labs, and exams is mandatory. If a student misses part of the course due to illness or a family emergency, work may not be made up without a note from the Dean of Students. For planned absences, students must make arrangements with the instructors prior to the event, at the discretion of the instructor. If a student is involved in a University-sponsored team or activity or military service etc. requiring regular travel, arrangements for completing work off-schedule must be made at the beginning of the course.

## Student Accommodations

To ensure that disability-related concerns are properly addressed from the beginning, students with disabilities who require assistance to participate in this class are asked to contact the instructors as soon as possible. All accommodations will follow the procedures as stated in Article 110 of the Student Code ([http://studentcode.illinois.edu/article1\\_part1\\_1110.html](http://studentcode.illinois.edu/article1_part1_1110.html)).

## Academic Integrity

According to the Student Code, “It is the responsibility of each student to refrain from infractions of academic integrity, from conduct that may lead to suspicion of such infractions, and from conduct that aids others in such infractions.” Academic integrity means being honest about your intellectual work. In the context of our course, this means that you assert that work you submit for the course is a product of your own intellectual effort and not the work of someone else. Please know that it is our responsibility as instructors to uphold the academic integrity policy of the University, which can be found here: [http://studentcode.illinois.edu/article1\\_part4\\_1-401.html](http://studentcode.illinois.edu/article1_part4_1-401.html). Some specific examples of activities that are prohibited in the course and may result in serious penalties, up to receiving a failing grade in the course, include:

1. Cheating on exams, having someone else take your exam, or having someone else answer in-class questions in your absence;
2. Copying the work of others (plagiarism), whether during an exam or in problem sets or lab work;
3. Posting of course materials, including, but not limited to, lectures, assignments, or test questions, on any website or in any online forum, whether privately or publicly available.

Incidences regarding academic integrity may be adjudicated through the University Faculty Academic Integrity Reporting system.

## Maintaining a good learning environment

We expect everyone to be respectful of TAs, class members, and instructors. During lecture or lab, students should maintain an environment conducive to learning and refrain from interrupting the course environment. Harassment or other like misconduct will not be tolerated.

## Copying material to outside sources

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We ask you to refrain from doing so because we put considerable effort into creating material for the course and we wish to maintain control over that material to enhance the experience of students yet to take evolution. Disseminating course materials to unauthorized recipients also cheapens your experience in the course

We routinely monitor online websites and forums to ensure course materials are not being re-distributed.

## Course Schedule

Date	Day	Topic	Instructor	Reading
Jan 20	Mon	No class MLK Day		
Jan 22	Wed	Introduction - HIV & Evolution 1	Roseman	Ch 1
Jan 24	Fri	HIV & Evolution 2	Roseman	Ch 1
Jan 27	Mon	HIV & Evolution 3	Roseman	Ch 1
Jan 29	Wed	The Pattern of Evolution/Natural Selection	Roseman	Ch 2
Jan 31	Fri	Phylogeny 1: Reading trees	Roseman	Ch 3
Feb 3	Mon	Phylogeny 2: Making trees	Roseman	Ch 4
Feb 5	Wed	Variation	Catchen	Ch 5
Feb 7	Fri	Mendelian Genetics 1: Selection and Mutation	Catchen	Ch 6
Feb 10	Mon	Mendelian Genetics 1: Selection and Mutation	Catchen	Ch 6
Feb 12	Wed	Mendelian Genetics 2: Migration and Drift	Catchen	Ch 7
Feb 14	Fri	Mendelian Genetics 2: Migration and Drift	Catchen	Ch 7
Feb 17	Mon	Linkage and Sex	Catchen	Ch 8
Feb 19	Wed	Linkage and Sex	Catchen	Ch 8
Feb 21	Fri	<b>Exam 1</b>		
Feb 24	Mon	Quantitative Genetics	Roseman	Ch 9
Feb 26	Wed	Quantitative Genetics	Roseman	Ch 9
Feb 28	Fri	Adaptation	Roseman	Ch 10
Mar 2	Mon	Adaptation	Roseman	Ch 10
Mar 4	Wed	Adaptation	Roseman	Ch 10
Mar 6	Fri	Sexual Selection	Catchen	Ch 11
Mar 9	Mon	Sexual Selection	Catchen	Ch 11
Mar 11	Wed	Sexual Selection	Catchen	Ch 11
Mar 13	Fri	Social Behavior	Catchen	Ch 12
Mar 16	Mon	No class: Spring Break		
Mar 18	Wed	No class: Spring Break		
Mar 20	Fri	No class: Spring Break		
Mar 23	Mon	Social Behavior	Catchen	Ch 12
Mar 25	Wed	Aging and life history	Roseman	Ch 13
Mar 27	Fri	Aging and life history	Roseman	Ch 13
Mar 30	Mon	Evolution and Human Health	Roseman	Ch 14
Apr 1	Wed	Evolution and Human Health	Roseman	Ch 14
Apr 3	Fri	<b>Exam 2</b>		
Apr 6	Mon	Genome Evolution	Catchen	Ch 15
Apr 8	Wed	Genome Evolution	Catchen	Ch 15
Apr 10	Fri	Genome Evolution	Catchen	Ch 15
Apr 13	Mon	Origin and Evolution of Early Life	Roseman	Ch 17
Apr 15	Wed	Species and Speciation	Catchen	Ch 16
Apr 17	Fri	Species and Speciation	Catchen	Ch 16
Apr 20	Mon	Evolution and the Fossil Record	Roseman	Ch 18
Apr 22	Wed	Evolution and the Fossil Record	Roseman	Ch 18
Apr 24	Fri	Evolution and the Fossil Record	Roseman	Ch 18
Apr 27	Mon	Development and Evolution	Catchen	Ch 19
Apr 29	Wed	Development and Evolution	Catchen	Ch 19
May 1	Fri	Human Evolution Fossils	Roseman	Ch 20
May 4	Mon	Human Evolution Genomes	Catchen	Ch 20
May 6	Wed	<b>Exam 3</b>		