

Spring 2025

EEOB 5630: Molecular Phylogenetics (3 credits)

Course Syllabus

Instructor:

Dr. Dennis Lavrov, Associate Professor

Office: 343A Bessey Hall,

Phone: 294-9091

Email: dlavrov@iastate.edu

Web: <https://lavrovlab.github.io/>

Slack: <https://eeob563.slack.com/>

Office hours: by appointment

Course Information:

Class meets on Tu/Th: 1:10-3:00 AM, 203 Bessey.

Class schedule and other class materials are available online at <https://isumolphyll.github.io/EEOB563/>.

Course Description:

This course is designed to introduce you to the theory and practice of phylogenetic analysis. The course emphasizes a hands-on approach to molecular phylogenetics and combines lecture presentations with computer exercises and discussion of original scientific literature.

Preparation:

Knowledge of basic genetics (e.g., BIOL 313) and basic evolutionary theory (e.g., BIOL 315) is important to understand material of the course.

Also, the following computer skills will come in very handy (and will be introduced in the course):

- Unix: many program we'll use in the labs require operational knowledge of unix.

- Git and GitHub: we will be using Git and github for version control and file sharing

Learning Objectives:

The four main learning objectives of the course are to learn

- how to read and interpret phylogenetic trees in published studies;
- how to choose appropriate methods and build phylogenetic trees based on molecular data;
- how to use various programs for phylogenetic analysis;
- when and how to use phylogenetic analysis to elucidate broader biological questions.

Textbook:

Elizabeth S. Allman, John A. Rhodes. *Lecture Notes: The Mathematics of Phylogenetics*. 2016 ([available online](#)). The book provides an alternative (more mathematical) perspective on several topics in the class. However, I will not follow this book directly and I will list readings to supplement particular topics.

I will also provide occasional handouts as references.

Attendance policy:

Attendance of lectures and participation in discussion is expected, please let me know in advance if you have to miss a class. **Missed labs need to be completed and a summary report submitted to the instructor.**

Grading:

Grades will be based on homework assignments, completion of laboratory exercises, a midterm exam, and the final paper/presentation.

- Homework assignments (7 assignments 5 points each): 35%;
- final paper and presentation: 25%;
- midterm exam: 25%,
- lab exercises: 10%
- article presentation/participation in discussions: 10%

[>93%=A; 87-93%=A-/B+; 83-87%=B; 77-83%=B-/C+; 73-77%=C, etc.]. Late work will be penalized by subtracting 1 pt/day unless an arrangement has been made prior to the due date.

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Academic Dishonesty

The class will follow Iowa State University's policy on academic dishonesty. Anyone suspected of academic dishonesty will be reported to the Dean of Students Office.

Accessibility Statement

Iowa State University is committed to assuring that all educational activities are free from discrimination and harassment based on disability status. Students requesting accommodations for a documented disability are required to work directly with staff in Student Accessibility Services (SAS) to establish eligibility and learn about related processes before accommodations will be identified. After eligibility is established, SAS staff will create and issue a Notification Letter for each course listing approved reasonable accommodations. This document will be made available to the student and instructor either electronically or in hard-copy every semester. Students and instructors are encouraged to review contents of the Notification Letters as early in the semester as possible to identify a specific, timely plan to deliver/receive the indicated accommodations. Reasonable accommodations are not retroactive in nature and are not intended to be an unfair advantage. Additional information or assistance is available online at www.sas.dso.iastate.edu, by contacting SAS staff by email at accessibility@iastate.edu

Discrimination and Harassment

Iowa State University does not discriminate on the basis of race, color, age, ethnicity, religion, national origin, pregnancy, sexual orientation, gender identity, genetic information, sex, marital status, disability, or status as a U.S. Veteran. Inquiries regarding non-discrimination policies may be directed to Office of Equal Opportunity, 3410 Beardshear Hall, 515 Morrill Road, Ames, Iowa 50011, Tel. 515-294-7612, Hotline 515-294-1222, email eooffice@iastate.edu

Free Expression

Iowa State University supports and upholds the First Amendment protection of freedom of speech and the principle of academic freedom in order to foster a learning environment where open inquiry and the vigorous debate of a diversity of ideas are encouraged. Students will not be penalized for the content or viewpoints of their speech as long as student expression in a class context is germane to the subject matter of the class and conveyed in an appropriate manner.

Religious Accommodation

Iowa State University welcomes diversity of religious beliefs and practices, recognizing the contributions differing experiences and viewpoints can bring to the community. There may be times when an academic requirement conflicts with religious observances and practices. If that happens, students may request the reasonable accommodation for religious practices. In all

cases, you must put your request in writing. The instructor will review the situation in an effort to provide a reasonable accommodation when possible to do so without fundamentally altering a course. For students, you should first discuss the conflict and your requested accommodation with your professor at the earliest possible time. You or your instructor may also seek assistance from the Dean of Students Office at 515-294-1020 or the Office of Equal Opportunity at 515-294-7612.

Contact Information:

If you are experiencing, or have experienced, a problem with any of the above statements, email academicissues@iastate.edu.