
Course goals:

The goal of the course is to give students a deep understanding of the biology and diversity of birds, knowledge that can be useful in a variety of settings, namely basic research, environmental policy and conservation biology.

Course format:

The course consists of lectures, 3-hour lab sessions each week, local half- and full-day field trips (minimum of 3 required throughout the semester), midterm and final in-class exams, and a final project. The final project consists of visiting a local park about 5 or 6 times across the spring semester with 3-4 other students in the class to tabulate and report on the changing diversity of birds over the spring semester.

Typical enrollees:

This course is typically taken by Integrative Biology majors. Freshmen are not allowed to enroll in the course. Other non-freshman students can take the course with the required prerequisites.

When is course typically offered?

Spring semester, usually every other spring.

Assignments and grading:

The grading scheme of past years will be followed and is presented below.

Enrollment cap, selection process, notification:

The main constraint on the number of students are the field trips and how many students can fit into one or more vans. There is an optional spring break field trip; typically, not all students attend and in principle we can take as many students as want to take the course so long as the spring break and other field trips are not oversubscribed. It would be helpful to learn from students when they apply to the course if they intend to take the spring break field trip or not. Seniors have priority, particularly IB majors; then juniors; then sophomores (sophomores can take the course in 2026 should that fit their schedule). Students without the relevant prerequisites are given lowest priority.

OEB190: Biology and Diversity of Birds, Spring 2024

Instructors: Prof. Scott Edwards & Dr. Jonathan Schmitt

Lectures will be held on Tuesdays and Thursdays from 12:00 – 1:15 pm, room 202, Museum of Comparative Zoology.

Laboratories: Schedule to be determined based on student preferences; likely Monday, Wednesday or Friday afternoons, 2.5 hours in length

Contact info:

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MCZ 118 Museum of Comparative Zoology

Weekly **office hours and optional collections exploration:** Fridays 2:30 – 3:30

Museum of Comparative Zoology Ornithology Collections, NW Labs, B3 level

Lecture Schedule: (Weekly Reading: papers from the primary literature. Chapters from L&F = Lovette and Fitzpatrick, Handbook of Bird Biology, are available on reserve but not required; see below)

| Week | Date | Topic | Reading* |
|------|-------------|--|---|
| 1 | Tue Jan. 23 | Course introduction: Why study birds? | L&F, Ch. 1 |
| | Thu Jan. 25 | Paleontology I: Dinosaur ancestors of birds | L&F, Ch. 6, through section 6.2.2; Figs 11.27 – 11.35 (Ch. 11); Handout, Sander pdf |
| 2 | Tue Jan. 30 | Paleontology II: The Radiation of Mesozoic Birds | Handout, pdf |
| | Thu Feb. 1 | Origin of feathers and flight | L&F, Ch. 4, sections 4.1 – 4.6 |
| 3 | Tue Feb. 6 | Origin of feathers and flight | L&F, Ch. 5 |
| | Thu Feb. 8 | Flight biomechanics and locomotion | L&F, Ch. 4, section 4.7 – end. |

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| 4 | Tue Feb. 13 | DEBATE 1: Origin of flight | |
| | Tue Feb. 13 | Mesozoic birds | L&F, Ch. 6, section 6.3 “end. |
| | Thu Feb. 15 | Mesozoic birds | L&F, Ch. 7 |
| 5 | Tue Feb. 20 | Bird brains and bird song | L&F, Ch. 10 |
| | Thu Feb. 22 | Anatomy / Reproductive cycles / Endocrinology | Handout, pdf |
| 6 | Tue Feb. 27 | Avian vision and coloration | L&F, Ch. 2 |
| | Laboratory midterm exam | | |
| | Thu Feb. 29 | Avian genetics and genomics & Diversity and systematic characters I | Handout, pdf |
| 7 | Tue Mar. 5 | Midterm exam | |
| | Thu Mar. 7 | Diversity and systematic characters II | Handout, pdf |
| 8 | Spring Break: March 9 - March 17 | | |

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| 9 | Tue Mar. 19 | Global biogeography of birds | Handout, pdf |
| | Thu Mar. 21 | Global biogeography of birds | L&F, Ch. 12 |
| 10 | Tue Mar. 21 | DEBATE 2: Hemispheric origins of birds | |
| | Tue Mar. 26 | Biogeography of North American birds | L&F, Ch. 14, section 14.9 |
| | Thu Mar. 28 | Migration: Global patterns and physiological cues | L&F, Ch. 9 |
| 11 | Tue Apr. 2 | Migration (contâ€™d) | Handout, pdf |
| | Thu Apr. 4 | Parasitism / Cooperative breeding | L&F, Ch. 17,18 |
| 12 | Tue Apr. 9 | Sexual selection | L&F, Ch. 9, section 9.6.4 and Handout |
| | Tue Apr. 9 | DEBATE 3: Function of bright coloration | |
| | Thu Apr. 11 | Life history evolution | Handout, pdf |
| 13 | Tue Apr. 16 | Diseases, Climate change and Extinction | -- |
| | Tue Apr. 16 | DEBATE 4: Funding bird conservation | |

Second lab exam

Thu Apr.
18

Conservation biology

Handout, pdf

14

Tue Apr.
23

In-class Final Exam

L&F, Ch. 15

*Background reading from Lovette, I. J. and Fitzpatrick, J. W. 2016. Handbook of Bird Biology (3rd edition), Cornell Lab of Ornithology. Available on reserve at the Ernst Mayr Library or at the Coop.

Review sessions will be arranged with the instructors before each written and lab exam.

Short in-class presentations

General topics for group in-class presentations, based on a recent published paper (no earlier than 2020), chosen by students and approved by instructors: Presentations will be 5-10 minutes (4 powerpoint slides max) and will take place at the beginning or end of the appropriate lecture slot.

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| Tue Feb. 6 | Paleontology |
| Thu Feb. 22 | Physiology/Anatomy |
| Thu Feb. 29 | Genetics |
| Tue Mar. 19 | Biogeography/Systematics |
| Tue Apr 2 | Migration |
| Tue Apr. 9 | Behavior |
| Tue Apr. 16 | Extinction/Conservation Biology |
| Thu Apr. 18 | Birds and climate change |

Grading:

| Activity | Percent of final grade |
|-------------------------|-------------------------------|
| Laboratory midterm exam | 15 |
| Written midterm exam I | 20 |
| Laboratory Final exam | 15 |
| Written midterm exam II | 20 |

Field project, written report 20

Topic presentations, laboratory participation 10

Field project write-up due Wed., May 1, 5 pm. Submitted via Canvas.