

# BIOL 199 Special Topics in Biology: Avian Natural History

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## **Course Description:**

This course provides a basic introduction to avian natural history for non-science majors as well as lower level natural resources and biology-related majors. Topics in this course include the evolution, morphology, behavior, reproduction, ecology, and conservation of birds. The course includes required trips to field sites that will concentrate on avian ecology and identification.

## **Required Texts:**

- Scott, G. 2020. *Essential Ornithology, 2<sup>nd</sup> Ed.*, Oxford University Press, Oxford, UK. ISBN 978-0-19-880475.
- choice of field guide to birds of the United Kingdom
- field notebook – *Rite in the Rain*® All-Weather Birder's Journal N<sup>o</sup> 195 (4<sup>5</sup>/<sub>8</sub> in x 7 in)

## **Course Objectives:**

Students completing this course should be able to:

- describe the evolutionary origins of birds.
- identify common local species of birds in their natural habitats by sight and sound.
- identify and explain anatomical and physiological features unique to birds.
- describe the population dynamics and life histories of birds.
- describe the ecological relationships among birds and their environments.
- explain common conservation issues related to birds and their habitats.

## **Grading:**

The final grade is calculated on a percentage basis:

Discussion/Participation = 20%

Participation is expected and only possible by attending every meeting. Contributions to discussions, activities, and asking/answering questions during meetings will ensure full credit, but more importantly, participation will provide you the best opportunity to succeed in this course.

Lecture Exams (2) = 50%

Each non-cumulative exam will cover approximately equal proportions of the material in the text as well as supplemental reading assignments.

Species Accounts = 10%

Each student will produce a presentation of species accounts describing a group of bird species representing a taxonomic group native to and common in England. These accounts will include the species' physical descriptions, behavioral characteristics,

geographic distributions, and the relationships between each species and other plants and animals in their communities.

Field Trip Notebook = 20%

Four field trips will be scheduled to provide opportunities for students to learn to identify birds by sight and sound. Students will also use these trips to understand the relationships among birds and their environments and to investigate the behavioral ecology of common species. Accounts of these trips will be recorded in the field notebook and checked after each field excursion for completeness and tidiness of field trip accounts.

**Grade Scale:**

A	94-100%	A-	90-93%		
B+	87-89%	B	84-86%	B-	80-83%
C+	77-79%	C	74-76%	C-	70-73%
D+	67-69%	D	60-66%		
F	0-59%				

**Attendance/Make-up Policy:**

Attendance is mandatory and expected, but certain extreme circumstances may require an isolated absence. It is the student's responsibility to notify the professor as soon as possible of the expected absence (absolutely no later than one day following the absence, in the case of an emergency) and to make necessary arrangements for lecture or field trip materials.

It is a serious offense to miss an exam. If this happens a grade of zero will be assigned for the missed exam. It is the responsibility of the student to contact the professor prior to the exam to schedule a make-up. If a student fails to contact the professor prior to the absence/missed exam to make arrangements, a make-up may not be granted. Special considerations may be made, on a case by case basis, if an exam is missed due to completely unavoidable circumstances. In this case, a student may be permitted to take a make-up exam if they contact the professor prior to the day of the next scheduled class. Each student must present a valid excuse at the time of the make-up. Make-up exams, if they are granted, must be completed within 1 week of the original exam date. Make-up exams will be administered at the convenience of the professor.

**Students with Disabilities:**

If you are a student with a documented disability and wish to use academic accommodations, you should speak with Dr. Kimball and campus Academic Support Services to arrange accommodations.

**Academic Honesty:**

Academic honesty promotes continued academic and occupational success. Maintenance of academic honesty and quality education is the responsibility of both faculty and students. Any assignments submitted by the student must be of the student's original authorship. Representation of another's work as his/her own shall constitute plagiarism. Violations of these principles shall be dealt with in accordance with the procedures set forth in the student handbook.

**Lecture Schedule (subject to change):**

<b>Date</b>	<b>Subject</b>	<b>Text Material</b>
Meeting 1	Evolution of Birds	pg. 1-22
Meeting 2	Feathers and Flight	pg. 27-50
Meeting 3	Movement: Migration and Navigation	pg. 51-71
Meeting 4	Eggs, Nests, and Chicks	pg. 73-92
Meeting 5	Exam 1; Reproduction	pg. 93-118
Meeting 6	Foraging and Avoiding Predators	pg. 119-127
Meeting 7	Predator Avoidance	pg. 128-137
Meeting 8	Populations and Communities	pg. 138-150
Meeting 9	Extinction and Conservation	pg. 152-155
Meeting 10	Exam 2; Presentation of Species Accounts	

**Field Trip Schedule (subject to change):**

<b>Field Trip</b>	<b>Subject</b>	<b>Location</b>
1	Birds of Woodland Communities	TBD
2	Birds of Wetland and Riparian Communities	TBD
3	Birds of the Coast	TBD
4	Birds of the Heath and Shrubland	TBD

## Topical Outline and Objectives:

### Evolution of Birds

- Describe the evolutionary relationship between birds and dinosaurs.
- Describe the role of *Archaeopteryx* in understanding avian evolution.
- Compare and contrast convergent and homologous morphological features of birds.
- Describe current status of evolutionary relationships among extant avian taxa.
- Describe the evolution of Darwin's finches as an example of adaptive radiation.

### Feathers

- Describe the different classifications of feather types.
- Describe the embryological development of feathers.
- Describe the spatial pattern of feathering on the body of a bird.
- Describe coloration and pattern development in plumage.
- Explain causes of feather damage and describe how birds maintain feather condition.
- Define and describe molt in birds.

### Flight

- Define and distinguish among gliding, soaring, and flapping flight.
- Describe aspects of the respiratory system that are specialized for flight.
- Explain the mechanics and physics of flight and flight speed.
- Describe the evolution of flight and flightlessness.

### Movement: Migration and Navigation

- Describe the ecological reasons and consequences for migration.
- Explain the genetic basis for migration.
- Describe physiological adaptations for migration.
- Describe the effects of weather on migration.
- Distinguish among different forms of navigational cues and describe spatial memory.

### Eggs, Nests, and Chicks

- Describe gender differentiation in birds.
- Describe the adaptations of gonads for flight.
- Describe the anatomy and development of the egg.
- Explain the ultimate and proximate causes for variation in egg coloration.
- Describe incubation, embryo development, and hatching.
- Distinguish among classes of developmental differences in hatchlings.

### Reproduction

- Define and describe differences among mating systems, including monogamy, polygamy (including polygyny and polyandry), and promiscuity.
- Describe variations in courtship behaviors and mate choice decisions.
- Describe the role of song in mate choice and courtship.
- Define imprinting and describe the role of imprinting begging in rearing young.

### Foraging and Avoiding Predators

- Distinguish among ecological classes of foragers and prey acquisition.
- Describe foraging strategies, including flocking behavior and information sharing.
- Define optimum foraging and explain the role of territoriality in food acquisition.
- Explain the relationship between risk assessment and foraging.

### Predator Avoidance

- Describe and distinguish among techniques for predator avoidance, including camouflage, distraction displays, tonic immobility, alarm calls, mobbing, flocking and coloniality.

### Populations and Communities

- Define population and describe mechanisms for changes in population size.
- Explain the role of life history strategies in population growth.
- Define community and niche.
- Explain the effects of competition and predator release on community structure.

### Extinction and Conservation

- Identify potential extinction risks to populations and communities.
- Describe various conservation techniques including their relative potentials for long-term success.