




### Introduction

- **Blake Mathys**
  - Ph.D. from Rutgers
  - Visiting Assistant Professor, Stockton College
- **Contact**
  - mathys@rci.rutgers.edu
- **Office Hours by request**
  - Plant Physiology Building

### Course Structure

- **Three Parts**
  - Lectures
  - Labs
  - Field Trips





### Lecture

- Mostly from Textbook
- Powerpoints posted
  - <http://blakemathys.com/ornithology.html>
- Two Quizzes, Two Exams
  - Total of 70% of grade
- Textbook Website

### Lab

- Bartlett Hall Room 012 (Basement)
- Learning to identify birds
  - Photographs and specimens
- Taxonomy
  - Order, Family, Common Name

### Field Trips

- Thursdays beginning next week
- Meet in this parking lot at **7 a.m.**
- We will return by 11:00 a.m.
- Wear **appropriate clothing**
- Bring binoculars if available
- Field Guide optional



Grading	
Quizzes (2 x 10% each)	20%
Test	25%
Lab Practical	20%
Final Exam	25%
Participation	10%

Letter Grades	
A = 91 – 100%	
B + = 88 – 90%	B = 81 – 87%
C + = 78 – 80%	C = 71 – 77%
D = 60-70%	
F = < 59%	

Schedule				
Monday	Tuesday	Wednesday	Thursday	Friday
	1	2	3	4
7 Lab	8	9 Quiz	10 Field	11
14 Lab	15	16 Test	17 Field	18
21 Lab	22	23	24 Field	25
28 Lab	29 Quiz	30	1 Field	2
5 Lab	6	7	8 Final	

- | Academic Honesty  |
|---|
| <ul style="list-style-type: none"> <li>• Don't Cheat</li> <li>• If you cheat, I'll turn you in</li> </ul> |

- | Attendance   |
|--|
| <ul style="list-style-type: none"> <li>• Not required for lecture, but recommended               <ul style="list-style-type: none"> <li>• <u>Required</u> for Field Trips</li> </ul> </li> <li>• Please be on time; if you're late, be courteous</li> <li>• No make-up exams or quizzes               <ul style="list-style-type: none"> <li>– Except extraordinary circumstances</li> </ul> </li> <li>• Email me <u>immediately</u> if you must miss an exam or quiz</li> </ul> |

- | Electronic Devices   |
|--|
| <ul style="list-style-type: none"> <li>• Make every effort to avoid disruption to others</li> <li>• If your use of a device is too distracting during lecture, I may ask you to put it away</li> <li>• Must be turned off and put away during exams, quizzes, and while outside the vans on field trips</li> </ul> |

### Communication

- <http://blakemathys.com/ornithology.html>
  - Announcements, lectures, pictures, ancillary material posted there
- Email: if you have a different email address than the one I emailed you at yesterday (or you didn't get the email), email me at [mathys@rci.rutgers.edu](mailto:mathys@rci.rutgers.edu) and let me know

### My lecture style

- Little text on slides, more talking
- Informal, feel free to ask questions
- Please participate, there is no such thing as a bad guess

### What is a Bird?

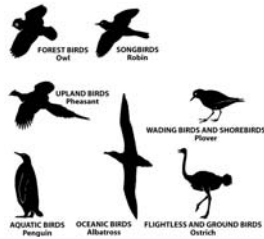


### What is a Bird?

- Feathers
- Furcula ("wishbone")
- Endothermic
- Bipedal
- Wings  
(but not necessarily flight)
- Toothless
- 1 occipital condyle
- Bills
- Gizzard
- Hollow Bones
- Four-chambered Heart
- External Eggs
- Large Brain
- Syrinx
- Nucleated RBCs
- Heterogametic Female
- One-way Respiration

### Species Diversity

- Domain Eukarya
- Kingdom Animalia
- Phylum Chordata
- Subphylum Vertebrata
- Class **Aves**
- 30 Orders
- 193 Families
- 2,099 Extant Genera
- ~10,000 Extant Species
  - Around 300 billion individuals



### Order Charadriiformes



### Table 1-1 Page 12

- Learn all 30 Order Names, and members – Simplified List

### Size Diversity

- **Smallest:** Bee Hummingbird – weighs ~2 g, the same as a penny
- **Largest:** Ostrich – equal to 50,000 Bee Hummingbirds

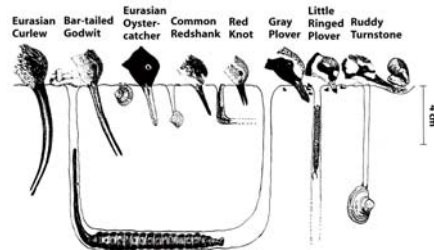


### Geographic Diversity

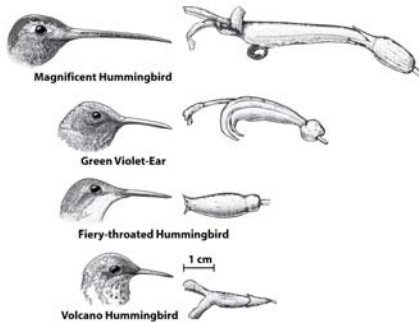
- Every continent
- Pervasive on land and water, including open ocean (but not nesting)
- Every latitude/altitude (a skua was seen crossing the South Pole, geese seen migrating over Mt. Everest)



### Dietary Diversity

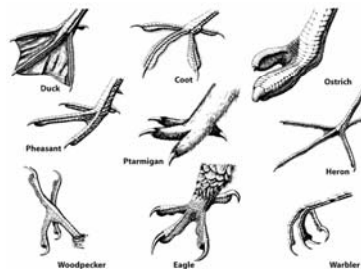


### Dietary Diversity




### Foot Diversity

- Ecology can be determined by morphology




### Adaptive Radiation

- When a taxon diversifies into many ecological niches and phenotypes





### Adaptive Radiation

- Order Passeriformes
  - 5,753 Species (next highest 429 species)
- Songbirds or Perching Birds





### Life History Diversity

- Laysan Albatross
  - > 50 year lifespan, 1 egg at a time
- Vermilion Flycatcher
  - 5 years maximum, 3 eggs at a time

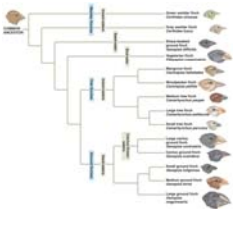
### Diversity is due to Natural Selection

- Mechanism for adaptation that leads to speciation
- Proposed by Charles Darwin and Alfred Russell Wallace in mid-1800s

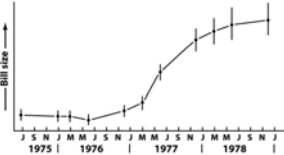




### Diversity is due to Natural Selection

- “Descent with modification”
- Heritable traits are not all passed on equally




### Diversity is due to Natural Selection


Medium Ground Finch  
Photo by Philip Precey

### Convergence


- Natural Selection for similar ecology/life history
- Unrelated taxa similar




Yellow-throated Longclaw



Eastern Meadowlark



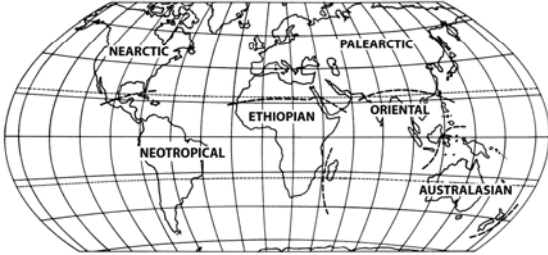
Peruvian Diving-Petrel



Razorbill

### Biogeography

- The geography of life
  - Where organisms occur, and why



### Biogeography

- The geography of life
  - Where organisms occur, and why
- Dispersal vs. Vicariance
  - Birds are good at dispersing