

# Parasitology

EFB 453/653

Lecture Times:

Laboratory:

Course Resources:

Tue/Thu 2-3pm Illick 5

Wed 1:50 - 4:50 Illick 122

<http://blackboard.syr.edu/>

Spring 2014

## Professor:

Dr. Christopher Whipps

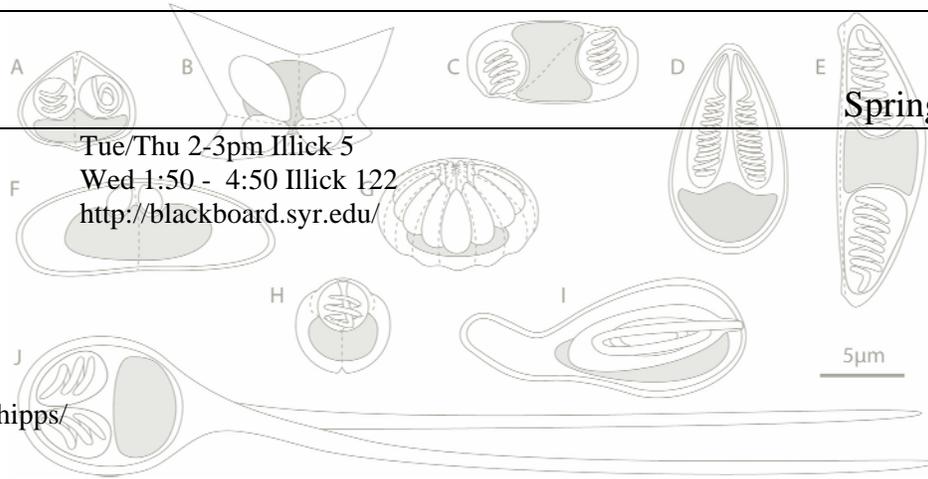
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Office Hours: TBA



## Undergraduate TAs

Samantha Page & Derry Albert

**Prerequisites:** One year of Introductory Biology, Ecology

**Overview:** This is an upper division course in Parasitology. We will cover the major taxonomic groups of parasites, focusing on the diversity of parasites, mechanisms of pathogenesis and life cycles, causation, key epidemiological concepts, terminology needed to study parasites and broader evolutionary implications. Subject matter will focus on parasites of medical and veterinary importance, as these are most well known, but we will also discuss parasites of other organisms and the evolutionary and ecological dynamics of parasite infections.

Student participation is emphasized in lecture and lab. The laboratory is intended to expose students to an array of parasite forms and functions. Labs will focus on examining preserved specimens and dissections of wild-caught animals. In this way, a known set of parasites will be examined and many more will be discovered and need to be identified. Students successfully completing this course should be conversant in the major concepts in Parasitology and should be able to identify important parasites or groups of parasites.

## Major Concepts:

- Diversity of parasites
- Parasite life cycles
- Ecology of Parasites

- Control of parasitic diseases
- Techniques in Parasitology
- Collection and diagnosis

## Required Text:

Parasitism: The Diversity and Ecology of Animal Parasites, 2nd Ed. (2013) Timothy M. Goater, Cameron P. Goater, Gerald W. Esch. *Cambridge University Press*. ISBN-13: 978-0521122054

## GRADES AND REQUIREMENTS:

### EFB453

- 45% Exams (3 x 15% each)
- 15% Lab (lab briefs and participation)
- 20% Lab Practicals
- 10% Case studies
- 10% Research article summary

### EFB653

- 45% Exams (3 x 15% each)
- 10% Lab briefs
- 20% Lab Practicals
- 10% Case studies
- 15% Presentation

## Exams (EFB453 & 653)

Three equally weighted 1-hour exams (2 hours for final) will be administered covering the information from lecture and lab. Questions may include; definitions, short answer, essay answer, and calculations. See schedule for dates – Exam dates are firm, so plan accordingly.

### *Laboratory (EFB453 & 653)*

Over the course of the semester laboratory activities will complement lecture materials of explore other areas of study better suited to the laboratory. Short reports will be required for some labs, typically due a week following the lab completion. These may be a summary of data and brief conclusion or a completed dissection sheet, line drawings of parasite, etc. I will also evaluate participation. I.e., are students doing their share of the work, are actively asking questions and exploring the materials provided? The remainder of the lab component will be based on 2 practical exams. Students will identify parasites, explain details of life cycles and indicate appropriate methods for the diagnosis of certain parasites.

Laboratory sections require reading the lab protocols ahead of time and collaborating well with others. During necropsies, findings in one specimen may vary widely from the next. Share and describe what you're finding with your colleagues.

### *Case Studies (EFB453 & 653)*

There will be 4 monthly case studies that students will be required to solve throughout the semester. These are posted at the CDC website (<http://dpd.cdc.gov/dpdx/HTML/Cases.htm>) and responses will be due within a week after the cases are posted. Previous cases and answers are posted and we'll use these in lecture as well. The goal of sing these case studies is to familiarize students with navigating the CDC parasitology website, learn about parasite identification and diagnosis through a research and discovery process, and provide logical arguments for differential diagnoses.

### *Research Article Summary (EFB453)*

In order to become familiar with parasitological research, students will be asked to pick a journal article from a parasitological journal (e.g., Journal of Parasitology, Parasitology, International Journal of Parasitology, Parasitology Today, etc.) or a journal with more general science interests (e.g., Science, Nature, Animal Behavior, Evolution, Ecology, etc.). The article must address some ecological, evolutionary, or behavioral aspect of parasitism. In addition, the article must have been published within the past 5 years. Articles must be submitted for approval prior to February 28th.

From this article you will prepare a summary written in the style of a Science Daily article or Editor's Choice article in Science (links below). The text will fit to one page, approximately 500 words, and can include pictures. Your article must have a title and the full citation of your journal article at the bottom. The idea is to distill the content of a complex scientific study into something that a non-scientist can understand and learn, and to provide a compelling lead-in that would attract readers to your journal article.

<http://www.sciencedaily.com/>

[http://www.sciencemag.org/cgi/collection/this\\_week\\_in\\_literature](http://www.sciencemag.org/cgi/collection/this_week_in_literature)

The first draft of the written summary is due March 21st and is will go through a peer review process. Following peer review (dates TBA), the first draft is turned in worth 80% of the overall score for the assignment. A revision must be submitted that addresses the comments in the first draft to earn the final 20% for the assignment (due date will be announced in class).

### *Class presentations (EFB653)*

Graduate students will give a 15minute presentation sometime during the semester on a parasite of their choosing (with instructor approval). The basics of any particular parasite are required, but students are encouraged to delve more deeply into other aspects of a parasite. Some potential topics might be parasite vaccines, drug resistance, host-parasite coevolution, tropic interactions, behavior, etc. Students will develop this presentation throughout the semester by first choosing a topic, identifying key literature, and writing a brief synopsis of their topic.

### **GRADING SCHEME**

A = 93% - 100%, A- = 90% - 92%, B+ = 87% - 89%, B = 83% - 86%, B- = 80% - 82%, C+ = 77% - 79%, C = 73% - 76%, C- = 70% - 72%, D = 60% - 69%, F = 59% or less

## UNIVERSITY AND DEPARTMENTAL POLICIES

**Support for Students With Learning And Physical Disabilities:** SUNY-ESF works with the Office of Disability Services (ODS) at Syracuse University, who is responsible for coordinating disability-related accommodations. Students can contact ODS at 804 University Avenue- Room 309, 315-443-4498 to schedule an appointment and discuss their needs and the process for requesting accommodations. Students may also contact the ESF Office of Student Affairs, 110 Bray Hall, 315-470-6660 for assistance with the process. To learn more about ODS, visit <http://disabilityservices.syr.edu>. Authorized accommodation forms must be in the instructor's possession one week prior to any anticipated accommodation. Because accommodations may require early planning and generally are not provided retroactively, please contact ODS as soon as possible.

### Academic Dishonesty

Academic dishonesty is a breach of trust between a student, one's fellow students, or the instructor(s). By registering for courses at ESF you acknowledge your awareness of the ESF Code of Student Conduct (<http://www.esf.edu/students/handbook/StudentHB.05.pdf>), in particular academic dishonesty includes but is not limited to plagiarism and cheating, and other forms of academic misconduct. The Academic Integrity Handbook contains further information and guidance (<http://www.esf.edu/students/integrity/>). Infractions of the academic integrity code may lead to academic penalties as per the ESF Grading Policy (<http://www.esf.edu/provost/policies/documents/GradingPolicy.11.12.2013.pdf>).

### Student responsibilities relative to the educational experience

*-Demonstrate Academic Honesty:* Students must avoid dishonest practice, including plagiarism and cheating, and other forms of academic misconduct.

*-Know Policies and Expectations:* It is each student's responsibility to be familiar with College regulations and to abide by them ([www.esf.edu/students/handbook](http://www.esf.edu/students/handbook) or in hard copy in 110 Bray Hall)

*-Report Academic Integrity Violations:* Dishonest actions, by even one individual, erode the very foundation of ESF's integrity as an institution. All members of the ESF community must take action when the College's collective honor is threatened or compromised. Violations of academic integrity can be reported directly to instructors or to any member of the Student Life staff.

*"The foundation of scholarship in all academic disciplines is honesty. At ESF, it is expected that you will pursue your educational aspirations with passion and integrity, honestly completing each assignment, every problem, and all exams and papers."*

## OTHER RESOURCES

### Texts:

Evolutionary Biology of Parasites – by Peter Price (Princeton Publishing)

Evolutionary Ecology of Parasites - by Robert Poulin (Princeton University Press)

Evolutionary Parasitology: The Integrated Study of Infections, Immunology, Ecology, and Genetics – by Paul Schmid-Hempel (Oxford Biology)

Georgis' Parasitology for Veterinarians by Dwight D. Bowman (Saunders)

The Art of Being a Parasite – by Claude Combes (University Of Chicago Press)

Veterinary Parasitology Reference Manual by Bill Foreyt (Wiley)

### Good reads (These are just great books):

\*Parasite Rex: Inside the Bizarre World of Nature's Most Dangerous Creatures – by Carl Zimmer (Free Press).

Keith County Journal – by John Janovy Jr. (Bison Books.)

The Malaria Capers: More Tales of Parasites and People, Research and Reality – by Robert Desowitz (W.W. Norton & Co.).

## TENTATIVE SCHEDULE

The following page has a list of topics that will be covered throughout the semester. Timing is approximate, particularly for lab schedule which must remain flexible to accommodate availability of specimens. Exam dates are firm to allow students adequate planning.

Tentative Schedule EFB453/653			
Week	Date	Lecture	LAB ( <u>Wednesdays</u> each week)
1	14-Jan	1 Principles of Parasitology	
	16-Jan	2 Principles of Parasitology	
2	21-Jan	3 Immunology and Pathology	Set up / Overview / Microscopy
	23-Jan	4 Apicomplexans: Gregarines	
3	28-Jan	5 Apicomplexans: Coccidians	Earthworm parasites
	30-Jan	6 Apicomplexans: Toxoplasma/Cryptosporidium	
4	4-Feb	7 Parasitic Protozoa	Apicomplexa
	6-Feb	8 Kinetoplasts and other Flagellates	
5	11-Feb	9 Amoeba	Protozoa
	13-Feb	10 Apicomplexans: Malaria	
6	18-Feb	11 Apicomplexans: Malaria	Cockroach lab
	20-Feb	12 <b>Exam 1</b>	
7	25-Feb	13 Myxosporeans/Microsporidia	<b>Lab Practical 1 - Protozoa</b>
	27-Feb	14 Platyhelminthes	
8	4-Mar	15 Digeneans	Digeneans
	6-Mar	16 Digeneans	
9	SPRING BREAK		
10	18-Mar	17 Digeneans	Frog Lab 1
	20-Mar	18 Cestodes	
11	25-Mar	19 Cestodes	Cestodes
	27-Mar	20 Cestodes	
12	1-Apr	21 <b>Exam 2</b>	Nematodes
	3-Apr	22 Nematodes: Overview	
13	8-Apr	23 Nematodes: Trichinellids	Frog Lab 2
	10-Apr	24 Nematodes: Hookworms	
14	15-Apr	25 Nematodes: Dracunculus, Filarial worms	<b>TBA</b>
	17-Apr	26 Nematomorphs	
15	22-Apr	27 Arthropods: Intro and fleas	<b>Lab Practical 2</b>
	24-Apr	28 Arthropods: Lice and crustaceans	
16	29-Apr	29 Overview	
		<b>Exam 3 during finals week</b>	