

**COURSE SYLLABUS for BIO 4460 – Parasitology**  
**4 credit hours; Fall 2016**

**Important Note:** This syllabus is subject to change at the discretion of the instructor

**Instructor:** Dr. Tamara J. Cook

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**Office Hours:** Mon-Thu 8:00 - 10:00 a.m.; or by appointment

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**LOCATION & TIME:** Lecture: LDB 215, MWF 11:00 – 11:50; Lab: LDB 139, W 3:00 – 5:50 p.m.

<b>EVALUATION:</b>	3 Lecture Exams @ 100 pts	300 pts
	Comprehensive Essays	50 pts
	3 Mystery Case Studies @ 50 pts	150 pts
	2 Laboratory Practicals @ 75 pts	150 pts
	2 Mini Case Studies @ 25 pts	50 pts
	Laboratory Notebook	50 pts
	Laboratory Technique	50 pts
	<b>TOTAL POSSIBLE POINTS</b>	<b>800 PTS</b>

**GRADING:** A = 720+    B = 640-719    C = 560-639    D = 480-559    F < 480

**LECTURE TEXT:** *Foundations of Parasitology*, 8<sup>th</sup> or 9<sup>th</sup> edition

**You must bring your textbook to ALL laboratory sessions.**

**Course Content:** Parasitology is an introduction to the biological relationship known as parasitism. Although there are many different types of parasites, our discussions will focus primarily on parasites that cause disease in humans. Lectures are intended to be dynamic, interactive presentations/discussions of the general biology of selected parasites. I feel that my role as instructor is to be a guide to learning rather than simply a dispenser of knowledge. Your active participation in the course will provide you with a basic, contemporary understanding of the material.

Lectures focus on the morphology, life cycles, physiological adaptations, evolution, ecology and distribution of the major parasitic organisms of humans. Parasitology is really an interdisciplinary course, encompassing the fields of pathology, immunology, ecology, entomology, epidemiology, and systematics. Thus, you will not only learn about parasites but you will gain valuable knowledge of related disciplines.

Laboratory exercises focus on morphology, anatomy, and classification of parasites. We will concentrate on diagnostic life cycle stages and all labs will include extensive drawing of examined material.

**Course Objectives:** To learn and understand the principles of parasitology through acquisition of: 1) a basic working vocabulary, 2) the ability to diagnose parasitic infections, 3) knowledge of the theories and principles, and 4) the intellectual tools that allow students to apply facts and concepts to novel situations.

**Preparation and Expectations:** You are expected to attend all lecture and laboratory sessions. Parasitology is an advanced course that will demand careful preparation and study, and as such, attendance is absolutely essential for success in meeting the basic course requirements. Further, the lectures are drawn from a wide variety of sources including the primary literature. The textbook serves as a reference, but the course does not directly track its content. I operate on the assumption that you actively participate in your own education and therefore I also assume that you are doing your part to prepare for class by completing the appropriate textbook reading. Because of the quantity of material we cover in this class, it will be to your advantage to keep up on your readings and to regularly attend lecture. Because your laboratory notebook is a significant portion of your grade and because the scheduled lab time is the ONLY time you will be able to complete assignments, there are obviously serious penalties for missing labs!

## COURSE EVALUATION

**LECTURE EXAMINATIONS (350 POINTS):** There will be three lecture exams (100 points each) consisting of a combination of fill in the blank, short answer, and essay questions taken from lecture material and reading assignments. They will require you to not only recall definitions and facts, but to also understand their meaning and context and to synthesize information from more than one lecture. The third exam will be given during the regularly scheduled final exam time and in addition to the 100 points for the regular lecture exam, there will be 50 points worth of comprehensive essay questions.

**CASE STUDIES (150 POINTS):** Three times during the semester I will provide you with various scenarios regarding parasitic infections in humans that we do not cover in lecture or lab. Adequate responses will require independent consultation with the primary literature and appropriate websites. Your responses to case study questions are to be typewritten. Each case study is worth **50 points**.

**LABORATORY EXAMINATIONS (150 POINTS):** There will be two lab practicals (75 points each). Approximately 25 items, representative of the parasites presented to you during the lab sessions, will be displayed for identification.

**LABORATORY MINI CASE STUDIES (50 POINTS):** To help you review for the lab practicals and begin synthesizing information from lecture and laboratory I will provide you with short scenarios regarding infections with parasites we have examined in lecture/lab. You will be given about 2 hours in lab to formulate solutions and during the last hour of lab, after you have turned in your responses, we will go over each case in preparation for the lab practical, which will be given the following week.

**LABORATORY NOTEBOOK (50 POINTS):** You are to prepare, **in lab**, a set original drawings of lab material **as you observe it**. We may look at some parasites that we do not cover in lecture. In this event, you will also be required to provide some written information about these species. Detailed instructions will be provided in lab.

**LABORATORY TECHNIQUE (50 POINTS):** The capabilities of scientists to make useful observations, to perform scientific investigations, and to uphold the safety and quality control standards mandated by regulatory agencies are dependent on the proper maintenance of support facilities. During laboratory sessions, I will rate your performance in these areas. This will include your use and maintenance of microscopes, maintenance of clean work area, and participation and attitude.

### MISCELLANESOUS IMPORTANT STUFF

**ACADEMIC DISHONESTY:** All students are expected to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain complete honesty and integrity in the academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action. The University and its official representatives may initiate disciplinary proceedings against a student accused in any form of academic dishonesty including, but not limited to, cheating on an examination or other academic work which is to be submitted, plagiarism, collusion and the abuse of resource materials.

**CELL PHONE USE:** During exams, cell phones and any other equipment capable of receiving, recording and/or transmitting information, must be put away in a book bag or purse. In short, it must not be readily accessible or accessed during an exam. *If I even SEE such devices during an exam, I will take this as defacto evidence of cheating and you will receive a zero for that exam and may fail the course.*

**CLASSROOM RULES OF CONDUCT:** Students are expected to assist in maintaining a classroom environment that is conducive to learning. Students are to treat faculty and students with respect. Students are to turn off all cell phones while in the classroom. Under no circumstances are cell phones or any electronic devices to be used or seen during times of examination. Students may tape record lectures and/or take notes using a laptop computer *provided they do not disturb other students in the process.*

**STUDENT ABSENCES ON RELIGIOUS HOLY DAYS:** Students are allowed to miss class and other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. Students remain responsible for all work. *See Student Syllabus Guidelines.*

**TENTATIVE LECTURE SEQUENCE:** The following schedule is a list of the lecture sequence. The numbers in parentheses represent the number of lecture periods I intend to spend on each topic and the corresponding chapter in the 9<sup>th</sup> edition of *Foundations of Parasitology*. I assume that you will follow this schedule in preparing for class and completing the appropriate textbook reading.

**Course Introduction (3, chapters 1-3)**

Grading; significance of parasitism in world affairs; general principles and concepts; transmission; factors influencing parasitism; outcomes and implications of parasitism  
Outline of “areas of responsibility” for selected groups of parasites

**Introduction to the protozoa (1, chapter 4)**

Terminology, structures, major life cycle events, and systematics

**Amoebae (2, chapter 7)**

*General:* structure, life history  
*Amebiasis:* course of infection, pathology, diagnosis and treatment  
*Epidemiology:* of intestinal amoebae  
*Commensal amoebae:* why they matter  
*Various opportunistic parasitic amoebae*

**Flagellates (intestinal and urogenital) (2, chapter 6)**

*General:* structure, life history

**Hemoflagellates of humans (4, chapter 5)**

*General:* structure and life history  
*Leishmania:* Kala azar, cutaneous and mucocutaneous  
*Trypanosomes:* trypanosomiasis & world affairs, African and American trypanosomiasis

**Lecture Exam 1 (September 26, 2016)**

**Apicomplexa (3, chapter 8)**

*General:* anatomy, structure, life history  
*General Coccidiosis:* economic impact in animals, role as human pathogens  
*Toxoplasma, Eimeria & Cryptosporidium:* epidemiology and course of infection

**Plasmodium (4, chapter 9)**

*General:* life history and course of infection  
*Malaria:* pathology, symptoms, treatment and prognosis  
*Malaria and human affairs*  
*Current research on malarial control*

**Introduction to Trematoda (1 chapters 13, 15, 17-18)**

*General:* Adult anatomy/ reproductive biology; life cycles/development

**Trematodes (4, chapters 17-18)**

*Liver flukes:* life histories, epidemiology, and pathology  
*Lung flukes:* life histories, epidemiology, and pathology  
*Others time permitting*

**Lecture Exam 2 (October 28, 2016)**

### **Schistosomes (4, chapter 16)**

*General:* course of infection, histopathology, treatment and prognosis  
*Schistosomiasis and human affairs:* antigenic mimicry  
*Ecological models:* approaches to parasite control  
*Cercarial dermatitis*

### **Cestodes (4, chapters 20-21)**

*General:* life history patterns among cestodes  
*Pseudophyllidea of humans:* dibothriocephaliasis and sparganosis  
*Cyclophyllidiea of humans:* *Taenia* and *Echinococcus*  
*Larval tapeworms:* human disease

### **Nematodes (5, chapters 22-30)**

*Enterobia:* clinical manifestations, treatment/prognosis, parasitism & human institutions  
*Trichinella:* course of infection, diagnosis/treatment, epidemiology, moral implications  
*Intestinal nematodes of humans:* the diseases, intestinal nematodes and human nutrition  
*Hookworm disease*  
*Filariasis:* course of infection, pathology, treatment and control

### **Lecture Exam 3 & Comprehensive Essays (December 7, 2016 from 12:00-2:00 p.m.)**

Please note the following holidays:

Sep. 5                      Labor Day  
Nov. 23, 25              Thanksgiving

### **TENTATIVE LABORATORY SCHEDULE**

Aug	24	No Lab
	31	Discussion of lab requirements and review of microscope skills
Sep	7	Parasitic and Commensal Amoebae
	14	Parasitic and Commensal Amoebae
	21	Intestinal and urogenital flagellates
	28	Hemoflagellates
Oct	5	Apicomplexa
	12	Protozoan Mini Case Studies
	19	<b>Lab Practical 1</b>
	26	No Lab
Nov.	2	Trematoda
	9	Cestoidea
	16	Nematoda
	26	<i>Thanksgiving Holiday; NO LAB</i>
	30	Helminth Mini Case Studies
Dec.	7	<b>Lab Practical 2</b>

## INFORMATION FOR PARASITOLOGY LABORATORY

The laboratory portion of this course is essentially *diagnostic parasitology*. Thus, it is designed to teach you the basics of identification of common parasites & commensals of humans. There is no required laboratory manual. I will provide you with the necessary information, **but you must bring your textbook to ALL laboratory sessions. I will not help anyone who does not have their textbook with them and open to the appropriate page!**

**WE HAVE BRAND NEW MICROSCOPES THIS YEAR (~ \$2000 each)!!!!** Thus, it is imperative that you are familiar with good microscope practices, therefore we will spend some time during the first lab period reviewing basic skills. You are responsible for the microscope and slides you examine this semester. I know how many slides of each specimen we have and I expect that there will be the same number at the end of the lab period as there was at the beginning. Of course, an occasional slide is inadvertently broken during the semester and we have budgeted for that. However, I ask you to please be particularly careful when handling the slides. One common way of misplacing and/or breaking slides is to accidentally leave them on the stage of your microscope at the end of the class period, or lying on your open text book. So, you are NOT allowed to have more than one slide at your station at a time and PLEASE check your microscope stage before you leave at the end of each laboratory period. **Note that 50 points of your total grade comes from good laboratory technique.**

The lab portion of this course meets on Wednesday afternoons from 3:00 –5:50 p.m in LDB 139. Although I may occasionally schedule some open lab times it is unwise to count on having access to the material at any time other than our scheduled laboratory time. It is extremely important that you come to every lab, stay for the entire lab, and complete all of your work during our regularly scheduled lab time. If you have another course that conflicts with a portion of the laboratory, then you simply need to make a decision about which course you want to take. A duplicate laboratory will NOT be created for you, and a duplicate laboratory practical will NOT be created for you. Again, do not ask. This is probably a no brainer for most of you, but I receive multiple requests for these types of special favors each year. You may NOT take slides or microscopes out of the laboratory or to another room and you may NOT be in this room unless I am present. The way I see it, if you miss a class, you can either 1) study intensely during the next laboratory to make up the material, or 2) drop the course.

During some laboratories, demonstrations may be set up to supplement the slide collections. These demonstrations generally consist of specimens either too valuable or too rare to allow you to look at them at your own work station. And they may be demonstrations of parasites that we do not cover in lecture. Demonstrations will be set up for ONE laboratory period only and you will be tested over this material.

It was pretty much impossible to have lecture and lab topics coincide. However, I generally will have at least introduced every major group in lecture prior to looking at it in lab. Therefore, if you prepare well for lecture, you will be prepared for lab. At the very least, it will be helpful, and will save laboratory time, if you briefly review each group of parasites before coming to lab. Believe me, it reduces confusion on your end and helps to reduce blood pressure on my end.

### Requirements for lab notebook:

1. Pencil with #3 or #4 lead (NOT #2)
2. A three ring binder (probably 1 inch will do)
3. A good eraser
4. High quality, 8<sup>1/2</sup> x 11, heavy, white paper
5. Ruler

Students often complain that they are not able to find the correct type of paper and/or pencils. Please note that I searched Office Depot's online store and found both for sale. They may not be available in the store, but you can order from the website, so I suggest you get these ordered early (you will need them by September 9<sup>th</sup>). Please note that the paper is often sold as "card stock" and some book stores stock "biology drawing paper". These are essentially the same thing and both are acceptable.