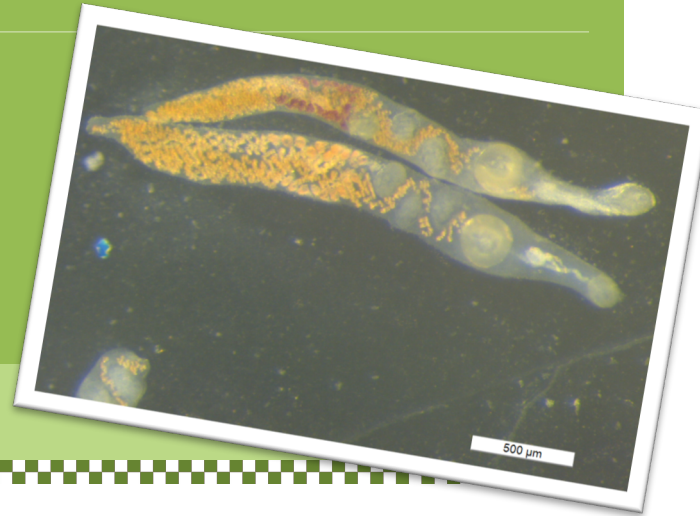


Animal Parasitology

“The medical tapestry of the world is full of organisms too small to see, carried by flying and creeping creatures too numerous to eradicate.” Robert Desowitz, *New Guinea Tapeworms and Jewish Grandmothers*



Instructor: Dr. Sarah A. Orlofske

Office Hours: MW: 9:00 – 10:00

AM or zoom by appointment

Office: TNR 446

Email: Sarah.Orlofske@uwsp.edu

Text: *Foundations of Parasitology* 9th Ed. Roberts & Janovy (Bookstore rental)

Lab Supplies: *Animal Parasitology Laboratory Manual* by Taft, Huspeni & Orlofske (Available from the Bookstore) and Dissection Kit (if you have one available from a previous class)

Course Objectives

- To help students gain a fundamental understanding and familiarity with the diversity of animal parasites, interactions with hosts, life history, physiology, and evolution.
- To assist students with incorporating knowledge of parasites into other branches of biology including community ecology, behavioral ecology, and conservation.
- To help students distinguish between parasites and disease and recognize the conditions that result in disease as well as appropriate and efficient preventative measures and management responses.
- To provide students realistic preparation for field and laboratory disease investigations through hands on experiences.



PARASITOLOGIST:

Quaint person who seeks truth in strange places; a person who sits on one stool, staring at another.

Roberts and Janovy 9th Edition.



Assignments

Hands on projects – Doing the work of a Parasitologist.

Lecture Activities: Throughout the semester students will watch recorded lectures outside of class in a “Flipped” Classroom format. The in-class lecture activities will serve as an interactive study and discussion period. Throughout the semester several graded assignments will be provided that will be completed in class.

Outreach Project: Each student in class will have the opportunity to choose a parasite or parasitology concept to explore in more detail and will create an original project to

communicate that information to the public. Outreach projects can take a variety of formats but will require incorporation of the scientific literature.

Scientific Paper Discussions:

Students will read a peer-reviewed scientific paper and work in small groups online and in class to analyze, evaluate, and synthesize the literature with respect to their other activities and lecture content.

Research Skills & Research Project:

Over the course of several labs students will be

guided in the main methods and techniques used in the study of animal parasites. These lessons correspond to potential research projects and students will have the opportunity to work in small groups during labs to develop their own questions and projects based on those research projects including hypotheses testing, data collection and analysis. The project will culminate with a group oral presentation and individual research portfolio documenting the connections the student makes among lab and lecture components.



Assessments of your learning

Take Home Exams: Lecture exams will emphasize key concepts, principles, taxonomic groups and characteristics of organisms and diseases they cause. Questions will include short answer, mathematical calculations, and essays.

Lab Quizzes: Lab quizzes will

require students to identify organisms, life stages, host use, anatomical structures as well as conduct diagnoses of infections based on host use, pathology, and geography. Microscopes will be used to present the specimens for identification.

Lecture	Points	Lab	Points
Take Home Exams (2 X 60 pts)	120	Lab quizzes (5 X 20 pts)	100
Lecture Activities (10 X 5 pts)	50	Research Skills (5 X 10 pts)	50
Outreach Project	50	Research Portfolio	50
Scientific Paper Discussions	30	Research Presentation	50
Total	250	Total	250

Grading scale and Point distribution

Final grades will be assigned based on the following **minimum** cutoff percentages:

A = $\geq 93\%$	A- = 89.9%
B+ = 87%	B = 83%
B- = 79.9%	C+ = 77%
C = 73%	C- = 69.9%
D+ = 67%	D = 63%
F $\leq 59.9\%$	

Course policies

Attendance.

Attendance for lecture and lab is mandatory, and past experience indicates there is a strong positive correlation between the amount of time a student spends in class and the final grade. We will frequently use research specimens and scheduling make-up opportunities for missed classes is exceedingly difficult. Make-up labs will be provided only in the case of serious illness (requiring a physician's note), or the death of a relative. However, absences relating to a student's religious beliefs will be accommodated according to [UWS 22.03](#),

providing the student notifies the instructor within the first three weeks of the beginning of class regarding the specific dates she/he will be absent.



You don't want to miss exciting parasite action!

Academic Integrity.

UW-Stevens Point values a safe, honest, respectful, and inviting learning environment. To ensure that each student can succeed, we have developed a set of expectations for all students

and instructors. Please see the resources on the Dean of Students webpage <https://www3.uwsp.edu/dos/Pages/stu-academic.aspx>

Academic integrity is central to the mission of higher education in general and UWSP in particular. Academic dishonesty (cheating, plagiarism, etc.) is taken very seriously. Don't do it! The minimum penalty for a violation of academic integrity is a failure (zero) for the assignment.

Communication.

I will attempt to respond to student emails within 48 hours or by Monday if you email over the weekend. Students need to send professional emails

Continued

including complete sentences, greeting, and closing. Remember that email is not texting or chatting. You are required to use your UWSP email address.

Disabilities.

The Americans with Disabilities Act (ADA) is a federal law requiring educational institutions to provide reasonable accommodations for students with disabilities. If you have a disability and require accommodations, please register with the Disability Resource Center: <https://www.uwsp.edu/disability-resource-center/>

Late Work Policy.

Be sure to pay close

attention to deadlines—there will be no make-up assignments or quizzes, or late work accepted without a serious and compelling reason and instructor approval before the deadline.

Grading.

If you believe I have made a mistake in grading your work, you must bring your concern to my attention within one week of receiving the graded assignment and I will re-evaluate it. I will not reconsider the assigned grade after one week. Please note that your grade at the end of the class will be based solely on the assignments and exams

turned in up to and a grade no matter how close you are to the next letter grade. Please do not ask; the answer will be no. In addition, attending tutoring or office hours, class participation, and overall effort in the class will help improve your understanding but will not be considered when assigning grades.



Contact me early if you need accommodations!

Learning Objectives - After completing the course students should be able to:

- Distinguish parasitism as a life history strategy.
- Identify the major groups of animal parasites: Trematoda, Cestoda, Nematoda, Acanthocephala, Protista, Insecta, etc.
- Describe general parasite life cycles, geographic distribution, and patterns of host use.
- Apply knowledge of parasite biology to fundamental questions in ecology and evolution.
- Design treatment or management strategies based on parasite biology in the context of wild and domestic animal and human health.
- Synthesize scientific resources to evaluate real-world problems including the role of parasites in host conservation, invasive species establishment and persistence, food web stability, and spillover between domestic and wild animals.

Tentative Course Schedule (Subject to Change)



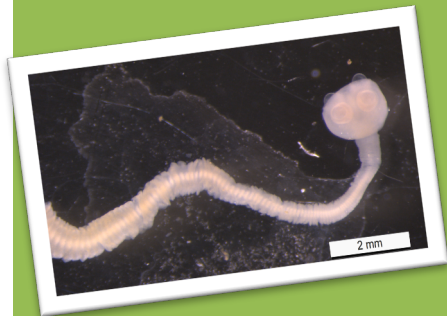
Course Meetings

Lecture: 10-10:50 MW
TNR 170

Lab 1: 11-12:50 MW
TNR 460

Lab 2: 1-2:50 MW
TNR 460

Coming late to class is disruptive. Please arrive to class on time!



I have failed in finding parasites in mosquitoes fed on malaria patients, but perhaps I am not using the proper kind of mosquito.

— Sir Ronald Ross

Day	Lecture Topic (Recorded)	Textbook	In class Activity	Lab Manual	Lab Materials
7-Sep	Introduction, general principles, definitions	Chap 1 & 2	Introductions - Course Design	Lab: 1-10	Lab introduction, Safety and Lab 1: Turbellaria, Monogenea & Aspidobothrea
12-Sep	Parasite adaptations, host specificity. Begin Platyhelminthes	Chap 1 & 2	Parasitology Math Skills	Lab: 30-35	Lab 4: Larval Digenea & Life Cycles & Snail Shedding
14-Sep	Turbellaria, Monogenea, Aspidoboth.	Chap.13-14,19	Lecture Activities	Lab: 11-17	Lab 2: Digenea I (Adult worms)
19-Sep	Digenea: schistosome distribution, & life cycle	Chap. 3, 15-16	Molecular Pre-lab Due		Research Skills - Molecular Project Part 1
21-Sep	Digenea: schistosome pathology, immunology, control methods	Chap. 3, 15-16	Outreach Project Introduction	Lab: 18-29	Lab 3: Digenea II (Adult worms)
26-Sep	Other medically important trematodes	Chap. 17 & 18	Lecture Activities		Research Skills - Molecular Project Part 2 Quiz 1 (Labs 1-4) Lab 5: Cestodaria & Major eucestode orders. (Museum and Collection Project)
28-Sep	<i>Scientific Paper Discussion 1</i>		<i>In-class Discussion</i>	Lab: 36-42	
3-Oct	Cestoda intro: Cestodaria, Pseudophyllidea	Chap. 20	Dissection Pre-lab Due		Research Skills - Dissection Project (Half of class)
5-Oct	Medically important Cestodes	Chap. 21	Outreach Project		Research Skills - Dissection Project (Half of class)
10-Oct	Parasite-host energetics, <i>Hymenolepis</i> competition		Research Project Introduction	Lab: 43-53	Lab 6: Cyclophyllideans
12-Oct	Nematodes: General features and Major groups	Chap. 22	Lecture Activities	Lab: 54-64	Lab 7: Nematodes I
17-Oct	Geohelminths	Chap. 23 - 28 (in part)	Research Project	Lab: 65-84	Lab 8: Nematodes II Quiz 2 (Lab 5-7) Lab 10: Acanthocephala, Mollusca, Annelida & Pentastomida
19-Oct	Nematodes: Guinea worm, filarial worms	Chap. 29-30	Lecture Activities	Lab: 86-96	
24-Oct	Nematomorpha & Acanthocephala & Annelida	Chaps. 31-32	Research Project	Lab: 85	Lab 9: Fecal analysis & Egg ID Lab 11: Parasitic Crustacea (Combined with Lecture Chapt 33,34)
26-Oct	Take Home Exam DUE		Exam - No in class meeting :)	Lab: 97-101	

Tentative Course Schedule Continued

Day	Lecture Topic (Recorded)	Textbook	In class Activity	Lab Manual	Lab Materials
31-Oct	Introduction to the Arthropods	Chaps. 33, 41, 38	Outreach Project		Research Project Work Quiz 3 (Labs 8-11)
2-Nov	Chelicerates (mites & ticks), Insecta: Siphonaptera	Chaps. 33, 41, 38	Lecture Activities	Lab:102-109	Lab 12: Mites, Ticks & Siphonaptera
7-Nov	Outreach Projects		Outreach Project Presentations and Peer Review		Research Project Work
9-Nov	Insecta: Phthiraptera (Mallophaga & Anoplura)	Chaps. 36	Research Project	Lab:110-114	Lab 13: Insecta: Phthiraptera (Mallophaga & Anoplura)
14-Nov	<i>Scientific Paper Discussion 2</i>		<i>In-class Discussion</i>		Research Project Work
16-Nov	Insecta: Diptera, biological control and Hymenoptera	Chaps. 37, 39 & 40	Lecture Activities	Lab: 115-126	Lab 14: Insecta: Diptera II: sand flies, mosquitoes, black flies, etc...
21-Nov	Cnidaria (Myxozoa), Protista: Microspora & Amoebae	Chap. 4, 11 & 7	Research Project		Research Project Work
23-Nov	Gut and Reproductive Tract Flagellates	Chap. 6	Lecture Activities	Lab: 127-135	Lab 15: Insecta: Diptera II, Hemiptera, Hymenoptera, & Coleoptera
28-Nov	Hemoflagellates I: New World Sleeping Sickness	Chap. 5	Research Project	Lab: 136-142	Lab 16: Myxozoa & Amoebae Quiz 4 (12-15)
30-Nov	Hemoflagellates II: Leishmaniasis	Chap. 5	Lecture Activities	Lab: 143-148	Lab 17: Gut Flagellates & Opaline
5-Dec	Apicomplexa I: Gregarines & Coccidia, Toxo	Chap. 10, 8	Research Portfolio Due		Group Presentations and Peer Review. Slide Collections DUE. Lab 18:
7-Dec	Malaria life cycle & pathology	Chap. 9	Lecture Activities	Lab: 149-154	Hemoflagellates & Ciliates
12-Dec	<i>Scientific Paper Discussion 3</i>		<i>In-class Discussion</i>	Lab: 155-164	Lab 19: Apicomplexa: Gregarines & Coccidians
14-Dec	Lecture Catch Up!		Lecture Activities	Lab: 165-176	Lab 20: Malaria
12/16/2022 8-10AM	Take Home Exam DUE				Quiz 5 (16-20)



Parasites are absolutely a bad thing if you're the individual infected by them. But they are a very natural component of ecosystems. Parasitism is the most popular animal lifestyle on the planet.

— Kevin Lafferty



Nowhere is it more true that "prevention is better than cure," than in the case of Parasitic Diseases.

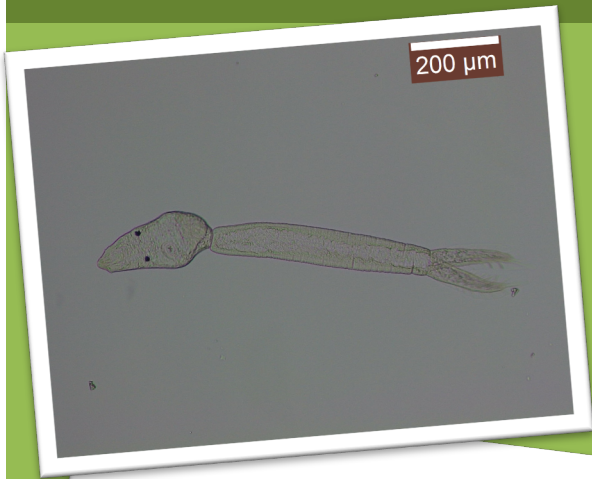
— Rudolf Leuckart

Course Expectations:

The lecture and laboratory portions of the course are intended to complement and reinforce one another and are given equal weight. The lecture will cover the diverse taxonomic groups of animal parasites and the concepts related to the study of parasitology and of its interdisciplinary components, ecology, evolution, behavior, molecular biology, conservation and medicine. The laboratory will consist of demonstrations, dissections, and examples of the groups of parasites covered, their lifecycles, host use, pathology, physiology, and development. The laboratory will also serve as a realistic research experience as students will collect, preserve, and identify parasite specimens as well as analyze data and prepare a scientific research presentation.

Welcome to the World of Parasites!

Have a fun and productive semester.



Notes: