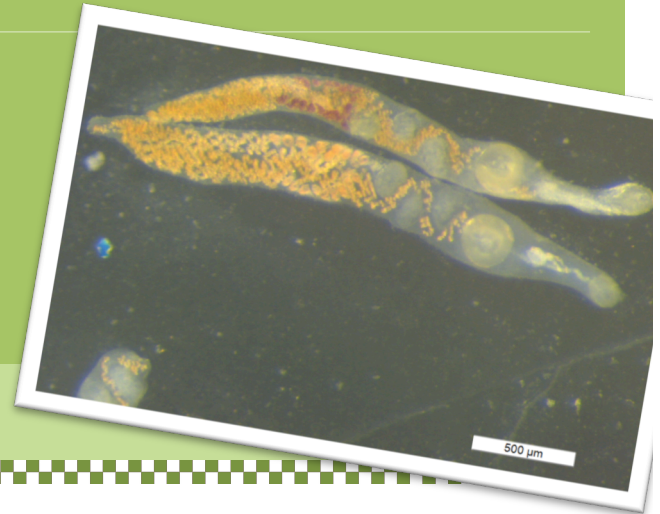


Animal Parasitology

“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: M: 11:30AM-1PM
W: 9:30-11AM
F: 10-11AM

Office: TNR 446

Phone: 715-346-4249

Email: Sarah.Orlofske@uwsp.edu

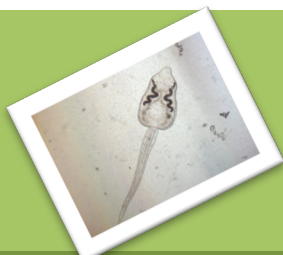
Text: *Foundations of Parasitology (FOP)*, 9th Ed. Roberts & Janovy (Bookstore rental)

Lab Supplies: *Animal Parasitology Lecture-Laboratory Manual (APLLM)* by Taft & Huspeni (Available from the Bookstore)

Dissection Kit & Gloves

Course Objectives

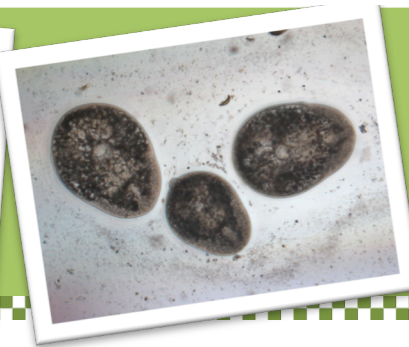
- To help students gain a fundamental understanding and basic level of familiarity with the diversity of animal parasites, interactions with hosts, life history, physiology, and evolution.
- To assist students with incorporating knowledge of parasites into other branches of biology including community 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.

Parasite Specimen Collection:

Throughout the semester students will necropsy hosts for parasite specimens from hosts provided for research projects or those they choose to donate for class projects. The purpose will be to obtain a collection of molecular and morphological specimens that will become a permanent part of the UWSP Parasitology Museum Collection for future research.

Research Project: Students will write *an individual research paper* based dissection data and/or class data set and

analysis. Papers will be 6-8 double spaced pages and include at least 4 primary scientific sources. Students will choose either the style of a scientific paper or case report.

Parasite Public Outreach:

Scientists frequently communicate their research to non-scientist audiences. Students work in groups to make a display for a public audience to be hosted on campus for the UWSP Parasitology Museum Collection.

Case Study: Students will work as groups to solve

real-life parasitology problems. Students participate in class discussions, give oral presentations or write position statements about their proposed solutions.

Practice Activities: These are several options to gain skills and specialize in topics most beneficial to your career. These items will be assessed for completeness rather than graded, giving students opportunities to by doing.



Assessments of your learning

Lecture Exams: Lecture exams will include an in-class portion emphasizing key concepts, principles, taxonomic groups and characteristics of organisms and diseases they cause. Part of the exams will consist of longer take home essay questions requiring synthesis of primary scientific

literature.

Practicals: Practical exams will be given in lab and 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
In class Exams 2 X 50 Final Exam 1 X75	100 75	Practicals 3 X 60	180
Take Home Exam 2X25	50	Scientific Paper Reading	20
Case Study	25	Specimen Collection	15 Midpoint 35 Final
Outreach Project	35	Research Paper (Case Report or Survey) - Draft	15
Practice Activities 3 X 5 Choose from list of options.	15	Research Paper - Final	35
Total	300	Total	300

Grading scale and Point distribution

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

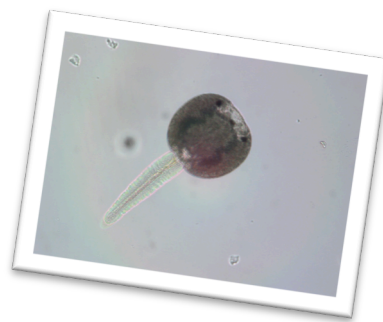
A = $\geq 93\%$	A- = 89.9%
B+ = 87%	B = 83%
B- = 79.9%	C+ = 77%
C = 73%	C- = 69.9%
D+ = 67%	D = 63%
F $\leq 59.9\%$	

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 her/his final grade. We will frequently use living material, and scheduling make-up opportunities for missed classes is exceedingly difficult. Make-up exams 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



You don't want to miss exciting parasite action!

of the beginning of class regarding the specific dates she/he will be absent.

Academic Integrity.

UW-Stevens Point values a safe, honest, respectful, and inviting learning environment. In order to ensure that each student has the opportunity to succeed, we have developed a set of expectations for all students and instructors. This set of expectations is known as the *Community Rights and Responsibilities* document, and it is intended to help establish a positive living and learning environment at UWSP. Click here for more information:

<http://www.uwsp.edu/dos/Documents/CommunityRights.pdf> - page=11.

Continued

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. For more information, see the UWSP "Student Academic Standards and Disciplinary Procedures" section of the *Community Rights and Responsibilities* document, Chapter 14, which can be accessed through the link above.

Disabilities.

The Americans with Disabilities Act (ADA) is a federal law requiring

educational institutions to provide reasonable accommodations for students with disabilities.

For more information about UWSP's policies, check here:

<http://www.uwsp.edu/disability/Pages/faculty/lawAndPolicy.aspx>.

If you have a disability and require classroom and/or exam accommodations, please register with the Disability and Assistive Technology Center and then contact me at the beginning of the course. I am happy to help in any way that I can. For more information, please visit the Disability and Assistive Technology Center, located on the 6th floor of the Learning

Resource Center (the Library). You can also find more information here: <http://www.uwsp.edu/disability/Pages/default.aspx>.



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
Location: TNR 460
Meeting times:
MON & WED
1-3:50 PM

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



Important notes about grading!

I will return graded material no later than 1 week after the assignment is due (2 weeks on rare occasions). If you believe I've 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 reevaluate it outside of class time. I will not reconsider the assigned grade after one week.

Date	Topic	Reading
Jan 22	Introduction, general principles, definitions	Chaps. 1 & 2
	Lecture Continued: Parasite adaptations, host specificity, Begin Platyhelminthes	
Jan 24	Turbellaria, Monogenea, Aspidoboth.	Chap. 13-14, 19
	Lab 1: Turbellaria, Monogenea & Aspidobothrea + Laboratory Expectations & Tutorials	Pp. 1-17
Jan 29	Digenea: schistosome pathology, immunology, distribution, & life cycle	Chap. 3, 15-16
	Lab 2 & 3: Digenea Intro., Digenea II & III <i>Schistosoma</i> (Adult worms)	Pp. 18-36
Jan 31	Other medically important trematodes + Case Study Intro	Chap. 17 & 18
	Lab 4: Digenea IV + <i>Paper Discussion 1</i>	Pp. 37-52
Feb 5	Trematode community ecology	
	Lab 5: Larval Digenea & Life Cycles + Data Recording and Descriptive Statistics	Pp. 53-63
Feb 7	Cestoda intro: Cestodaria, Pseudophyllidea	Chap. 20 & 21
	Passerine Dissection + Preservation Techniques	Protocols
Feb 12	Case Study Presentations	
	Lab 6 & 7: Cestodaria, major eucestode orders & Cyclophyllideans I	Pp. 79, 82-92, 99-116
Feb 14	Medically important Cestodes	Chap. 21
	Waterfowl Endoparasite Dissection (Collaboration with Wildlife Techniques Course)	Protocol
Feb 19	Parasite-host energetics, <i>Hymenolepis</i> competition	
	Lab 8: Cyclophyllideans II & Caryophyllidea + Staining and Mounting Platyhelminths	Pp. 117-124 & Protocols
Feb 21	Nematodes: General features and Major Groups	Chap. 22
	Lab 9: Nematodes I; + <i>Paper Discussion 2</i>	Pp. 125-131, 144-153
Feb 26	Geohelminths	Chap. 23-27
	Lab Practical 1	
Feb 28	Lecture Exam 1 + Take Home Assigned	
	Lab 12: Fecal analysis & Egg ID	Pp. 175 & 309-328
Mar 5	Nematodes: Guinea worm, filarial worms	Chap. 29-30
	Lab 10 & 11: Nematodes II & III + Photomicroscopy & Begin Outreach Project	Pp. 154-174
Mar 7	Insect nematodes, Nematomorpha & Acanthocephala & Annelida + Take Home DUE	Chaps. 31-32
	Lab 13: Acanthocephala, Mollusca, Annelida & Pentastomida + Mounting Nematodes	Pp. 176-182 & Protocols
Mar 12	Parasitic Arthropods Intro & Parasitic Crustacea	Chaps. 33-34
	Lab 14: Parasitic Crustacea	Pp. 183-189
Mar 14	Chelicerates (mites & ticks), Insecta: Siphonaptera	Chaps. 35, 38, 41
	Lab 15: Mites, Ticks & Siphonaptera; + Mounting Mites	Pp. 190-204 & Protocols

Tentative Course Schedule Continued

Date	Topic	Reading
Mar 19	Insecta: Phthiraptera (Mallophaga & Anoplura) Lab Practical 2	Chaps. 36
Mar 21	Insecta: Diptera, biological control and Hymenoptera Specimen Collection + Midpoint Check	Chaps. 39 & 40
Mar 26 & 28	SPRING BREAK ☺	
Apr 2	Parasite Outreach Project Due & In class Display Lab 16: Insecta: Phthiraptera (Mallophaga & Anoplura) + Mounting Insects	Pp. 207-213 & Protocols
Apr 4	Lecture Exam II + Take Home Assigned Lab 17: Insecta: Diptera I: sand flies, mosquitoes, black flies, etc...	Pp. 214-218, 229-238
Apr 9	Cnidaria (Myxozoa), Protista: Microspora & Amebae Lab 18: Insecta: Diptera II, Hemiptera, Hymenoptera, & Coleoptera	Chaps. 11, 4 & 7 Pp. 239-250
Apr 11	Gut and Reproductive Tract Flagellates + Take Home Due Lab 19: Myxozoa, Microsporidia & Amoebae	Chap. 6 Pp. 251-260
Apr 16	Hemoflagellates II: New World Sleeping Sickness, Leishmaniasis Lab 20: Gut Flagellates & Opalinida	Chap. 5 Pp. 261-266
Apr 18	Ciliates & Apicomplexa I: Gregarines & Coccidia Lab 21: Hemoflagellates	Chaps. 10 & 8 Pp. 267-270
Apr 23	Apicomplexa II: <i>Toxoplasma</i> life cycle & epidemiology Data Analysis for Papers	Chap. 8
Apr 25	Malaria: History & life cycle Lab 22 & 23: Ciliates & Apicomplexa I (Gregarines) & II (Coccidians)	Chap. 9 Pp. 275-287
Apr 30	Malaria life cycle & pathology I Draft Paper Due; In class Peer Review	Chap. 9
May 2	Malaria pathology II Lab 24 & 25: Malaria I & II	Chap. 9 Pp. 288-298
May 7	Malaria diagnosis, treatment & genetic adaptations to malaria Lab: Open lab for work on parasite collection	Chap. 9
May 9	Final Lecture Exam Final Specimen Collection due at end of class	
May 16	2:45-4:45AM Lab Practical III + Final Paper Due	



Open Lab Time:

I will attempt to leave the lab door open (or unlocked) during all other available hours. Students should plan dissections and slide preparation activities accordingly during open blocks of room time. Generally, prepared slides will be available for student review during all open lab times.



Dissection Specimens:

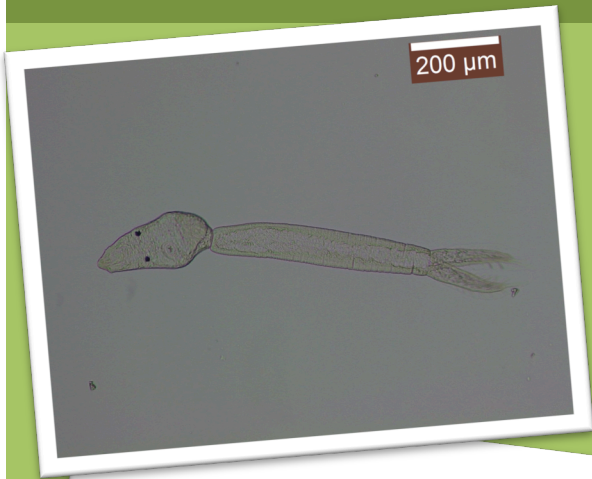
Assorted carcasses (e.g., passerines, raptors, assorted mammals, etc...) are available for student dissection and research projects. Donations of legally obtained hosts (from hunting/fishing) are also welcome. Please discuss specimens or questions about hosts for use in the class with the instructor prior to dissection.

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 paper.

Welcome to the World of Parasites!

Have a fun and productive semester.



Notes: