PATH*3040 Principles of Parasitology W (3-3) [0.50]
WINTER SEMESTERS

SCHEDULING:

24 × 90 minute lectures (2/week)
– OVC, P/AHL (Bldg 89), Room 1810, Tues/Thurs 11:30-12:50
(unless informed otherwise)

12 × 180 minute laboratory (1/week)
– OVC, P/AHL (Bldg 89), Room 1813, Thurs 2:30PM - 5:20PM

Prerequisite(s):

- 10 credits; min grade 050
- 1.50 credits from subject biol mbg zoo micr bot hk biom; min grade 050

NOTE: This course will be of general interest to students in zoology, biology and/or biomedical sciences. In particular, the course could be considered as an elective within the following Majors (Honours Programs) - Wild Life Biology (IB-CBS), Zoology (IB-CBS), Biological Science (CBS), Microbiology (MCB-CBS), and Bio-Medical Sciences (HB+NS-CBS and BMS-OVC). Less closely related Majors that could use this course as an elective include Marine and Freshwater Biology (IB-CBS) and Molecular Biology and Genetics (MCB-CBS).

CALENDAR DESCRIPTION:

Parasitism is the most common biological association on the planet; virtually all organisms are parasitized by numerous parasites and many, such as the protists that cause malaria, are responsible for serious medical and/or veterinary diseases. This course will provide an in depth introduction to parasites and parasitism by exploring common protists, helminths and arthropods that infect animals and humans globally. The nature of parasitism will be explored by examining the development and transmission of many common parasitic agents, including their pathogenesis, zoonotic potential, diagnosis and treatment options.

Course Coordinator and Instructor:

Dr. John R. Barta,
Department of Pathobiology,
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Teaching Assistant: One GTA.

COURSE OBJECTIVES:

1. to introduce the concept of parasites and parasitism (including commensalistic, mutualistic and truly parasitic associations), the most common ecological association among extant eukaryotic species on the planet;
2. to explore the current breadth of parasitic agents known to infect wildlife, domestic animals and humans globally. Students should be able to name, spell and identify the common parasites discussed in this course to a degree of accuracy permitting an association with a particular organism/group or disease (e.g. trichostrongyle, *Plasmodium falciparum*, malaria, *Anopheles*, *Demodex*, *Ancylostoma caninum*, stomach bot, *Hypoderma*, *Eimeria*, *Strongylus vulgaris*, etc.).
3. to examine the patterns of development of various parasitic agents and thus the basis of their successful transmission from host to host (pathogenesis and pathology associated with those agents will be explore where relevant).
4. to understand and gain experience with basic laboratory diagnostic methods in parasitology (e.g. fecal flotations, skin scraping, Baermann techniques).
5. to introduce the variety of strategies currently employed to control some of the medically and/or economically important parasites

TEACHING STRATEGIES:

Both lecture and laboratory teaching formats are to be used with fixed and living specimens available for study. In addition, web- and/or CD-ROM-based material will be made available throughout the course to supplement the physical materials presented in the laboratory setting.

EVALUATION METHODS:

1. MID-TERM TEST: DATE TBA

Written, essay and/or short answer.
This test includes all material covered up until one week before the mid-term date. Minimally, this will include the introduction to parasites and parasitism as well as more detailed coverage of protistan and arthropodan parasites. A number of image-based, timed, short-answer questions will form part of the mid-term test to aid in the formative assessment of laboratory skills and knowledge. The remainder of the mid-term test will be a mixture of short answer and essay questions. An example can be found on CourseLink.

2. FINAL TERM TEST: DATE TBA

This test is divided into two parts:

(a) Written, essay and/or short answer - This test covers all material presented within the course (lectures and laboratories). **This test is written during the final examination period.**
(b) Practical - This test is based on all material covered in laboratory periods 1 to 12 inclusive. The specimens for examination will consist of whole parasites, organs with gross lesions, glass slides with parasites or histological sections and/or

images as used throughout the course. Emphasis will be upon identification of parasites (diagnosis) and the life cycle stage presented with short answer questions appropriate to this end. **This test is written prior to the final examination period during the last week of classes in our normal lecture slot.**

3. VALUE OF TESTS (%)

Mid-term Test (TBA – at conclusion of 'Protists')	35%
Final practical (Last week of classes)	35%
Final written (During Scheduled Examination Period):	30%
Total	100%

REQUIRED TEXT:

Course and laboratory notes prepared by the instructor available through CourseLink.

SUPPLEMENTARY TEXTS (NOT REQUIRED):

***Parasitology and Vector Biology*, 2nd Edition**. 1999. William Marquardt, Richard Demaree, & Robert Grieve. ISBN: 0-12-473275-5, 702 pages. Academic Press, London.

***Foundations of Parasitology*, 8th Edition.** 2008. Gerald D. Schmidt & Larry S. Roberts. ISBN 978–0–07–302827–9, 720 pages. McGraw-Hill Publishing.

TEACHING RESOURCES:

CourseLink - Course Notes and Related Materials - Course notes will be available through D2L (CourseLink @ the University of Guelph). Review images, the course outline and schedule of labs and lectures can be found at this site as well.

Glass Slides - a set of glass slides of parasite forms and lesions used in the laboratories are available from Nathalie Lemieux, Department of Pathobiology, Room 1810. Cumulative review sets will be made available following each of the laboratory sessions for the remainder of the semester.

TENTATIVE SCHEDULE OF LECTURES AND LABORATORIES
(subject to modification)

Week 1
Lecture 1 – Introduction to parasitology and parasitism; course overview and description of resources.
Lecture 2 – Arthropods 1 – Overview of parasitic groups plus ectoparasitic diptera (parasites and vectors)
Lab 1 – Introduction to Parasites – An overview.

Week 2
Lecture 3 – Arthropods 2 - Endoparasitic diptera, pentastomes, parasitic copepods
Lecture 4 – Arthropods 3 – Arachnids – Ticks, Mites and Spiders
Lab 2 – Arthropods (Mallophaga, Anoplura, Siphonaptera, Hippoboscids, bots, arachnids [ticks, mites, spiders], parasitic copepods, Diptera)

Week 3
Lecture 5 – Introduction to Protists plus kinetoplastids (trypansomes and relatives)
Lecture 6 – Introduction to Apicomplexa plus monoxenous coccidia, gregarines
Lab 3 – Flagellates and coccidia (mealworm dissection for gregarines/fecal float introduction), live *Eimeria*

Week 4
Lecture 7 – Heteroxenous coccidia
Lecture 8 – Haemoparasitic apicomplexan parasites – malaria and piroplasms
Lab 4 – Heteroxenous Apicomplexa – plus blood sampling techniques (blood smears, microhematocrit centrifugation for trypanosomes, molecular methods (IFA and/or PCR from blood). coccidia culture.

Week 5
Lecture 9 – Microsporidia and myxosporean/actinosporean parasites
Lecture 10 – Introduction to Helminths
Lab 5 – Microsporidia and myxosporean/actionosporea, helminth overview demonstration

Week 6
Lecture 11 – Introduction to Trematodes and Aspidogastrea/Monogenea
Lecture 12 – Trematodes (Digenea)
Lab 6 – Trematodes

Week 7
Lecture 13 – Introduction to Cestodes plus Cyclophyllidea
Lecture 14 – Cyclophyllidea continued, remaining major orders (Pseudophyllidea and Proteocephalidea)
Lab 7 – Cestodes (all orders)

Week 8
Lecture 15 – Acanthocephala (thorny headed worms) and Introduction to nematodes
Lecture 16 – Ascarid nematodes
Lab 8 – Introduction to nematodes, acanthocephala

Week 9
Lecture 17 – Introduction to strongylid (bursate) nematodes - hookworms.
Lecture 18 – Strongylid lab 1 - Hookworms
Lab 9 – Overview of Strongylids, plus hookworms

Week 10
Lecture 19 – Trichostrongyles.
Lecture 20 - Lungworms
Lab 10 – Strongylid lab 2 – remaining bursate nematodes

Week 11
Lecture 21 – Spirurid nematodes and their relatives – sushi diseases; Filarial worms and filarial diseases of humans
Lecture 22 – Enoplid nematodes – Trichinella, whipworm and kidney worms
Lab 11 – Stomach, filarial and enoplid nematodes –

Week 12
Lecture 23 – Host responses to parasitic infection, ecology, population biology
Lecture 24 – Control strategies for parasitic diseases
Lab 12 – Unknowns and review – review of diagnostic methods, zoonoses