

## Department of Biology Course Outline

SC/BIOL 4360 3.00 Parasitology  
Fall 2016

### Course Description

Biology of animal parasites; developmental, structural and functional adaptations to the parasitic environments; immune and other responses of hosts; parasitic diseases. Three lecture hours. One term. Three credits.

### Prerequisites

SC/BIOL 2030 4.00

### Course Instructors and Contact Information

Course Director - Dr. Spencer Mukai  
Office – 002 Farquharson (Keele Campus), 344 York Hall (Glendon Campus)  
Email – [smukai@yorku.ca](mailto:smukai@yorku.ca)  
Office hours – 5:30 -6:30 pm OR by appointment

### Schedule

Tuesday 7:00-10:00 pm  
Life Sciences Building (LSB) 105

### Evaluation

#### Assignments and Grading:

Mid-Term Exam (Tuesday October 25, 2016 – 1.5-2 hr duration – in class).....	25%
Enquiry-based learning assignment (due November 29, 2016).....	20%
Parasite classification, structure & function (Quiz 1- Oct. 11, Quiz 2- Nov. 15) .....	10%
Participation (5 quizzes).....	5%
Final Exam (cumulative).....	40%
	<b>100%</b>

\*Final course grades may be adjusted to conform to Program or Faculty grades distribution profiles.

## Important Dates

Quiz 1 (first half of class time- October 11, 2016)  
Mid-term exam (1.5- 2 hr in class - October 25, 2016)  
Quiz 2 (first half of class time- November, 15, 2016)  
Enquiry-based assignment (due November 29, 2016)  
Final exam (during Fall exam schedule, Dec. 7-22, 2016)

First day of class: Tuesday September 13, 2016

Last day of class: Tuesday November 29, 2016

Drop date: Friday November 11, 2016

\*Course Withdrawal Period (withdraw from a course & receive a "W" on the transcript): Nov.12– Nov.29

\*You may withdraw from a course using the registration and enrolment system after the drop deadline until the last day of class for the term associated with the course. When you withdraw from a course, the course remains on your transcript without a grade and is notated as "**W**". The withdrawal will not affect your grade point average or count towards the credits required for your degree.

NOTE: for additional important dates such as holidays, refer to the "Important Dates" section of the Registrar's Website at <http://www.yorku.ca/yorkweb/cs.htm>

## Resources

Required Text: **Parasitology: A Conceptual Approach (2015)**. Eric S. Loker and Bruce V. Hofkin. Garland Science.

Other excellent reference texts:

- Parasitology: An Integrated Approach. Gunn, A. and Pitt, S.J. John Wiley & Sons Inc., NJ (2012)
- Human Parasitology 4<sup>th</sup> Edition. Bogitsh, B.J., Carter, C.E., and Oeltmann, T.N. Academic Press, MA (2013)
- Foundations of Parasitology 8<sup>th</sup> Edition. Roberts, L.S. and Janovy, J. Jr. McGraw- Hill, NY (2009)

Supplementary text books, manuals and CD-ROMs will be made available at the Reserve Desk in the Steacie Science & Engineering Library.

## Learning Outcomes

**Upon successful completion of this course, students should be able to:**

1. Describe general principles and concepts of parasitology
2. Understand the terminology used in parasitology and to use parasite terminology with proper context
3. Be able to classify major parasites of animals and humans
4. Identify, draw and describe the structure and function of cells, tissues and organs of various animal parasites
5. Describe and be able to compare and contrast the many strategies that parasitic animals have undertaken to successfully complete their life cycles in the face of discontinuity of hosts
6. Describe the diseases caused by animal parasites and understand the measures for treatment, prevention and control of each parasite
7. Generalize on the intestine as a place for animal parasites to inhabit and to predict the changes that animal parasites may make to the intestinal milieu that are supportive of the parasite
8. To develop an understanding of the physiological, morphological, and behavioral adaptations of a parasitic lifestyle
9. Describe how anthropogenic changes to the environment can alter parasite transmission
10. Describe, with the aid of figures, some of the ways by which the host may respond to the presence of animal parasites, in particular in mounting an adaptive and protective immune response, and to consider the many ways by which animal parasites may circumvent the defense mechanisms of the host
11. Work effectively and cooperatively in small groups to elucidate an answer to an enquiry-based research topic

## Course Content

### BIOL 4360 3.0- Parasitology

FALL 2016

#### Class dates & proposed lecture topics

**September 13**, Introduction; principles and general concepts; terminology

**September 20**, Parasitic Protozoa – Introduction to parasitic protozoa; Rhizopoda

(*Entamoeba histolytica*, *Naegleria floweri*, *Acanthamoeba* spp.)

**September 27**, Parasitic protozoa- Metamonada (*Giardia lamblia*, *Trichomonas vaginalis*)

**October 4**, Parasitic protozoa - Apicomplexa (*Plasmodium* spp., *Toxoplasma gondii*, *Cryptosporidium* spp., *Babesia* spp.)

**October 11**, Parasitic Protozoa – Kinetoplastida (*Leishmania* spp., *Trypanosoma* spp., other flagellates)

**October 18**, Platyhelminths – General features; Class Trematoda– the digeneans

**October 25, MID-TERM EXAM**

**October 27 – 30, Fall Reading Days**

**November 1**, Platyhelminths - Class Monogenea – monogeneans

**November 8**, Platyhelminths - Class Cestoda (Cestoidea) – the tapeworms

**November 15**, Nematodes – General features; Class Enoplea – *Trichuris trichiura*, *Trichinella spiralis*, mermithids

**November 22-29**, Nematodes - Class Rhabita (Rhabditea) - *Strongyloides stercoralis*, *Ancylostoma duodenale*, *Necator americanus*, *Ascaris lumbricoides*, *Wuchereria bancrofti*, *Brugia malayi*, *Onchocerca volvulus*, *Dracunculus medinensis*

## Experiential Education and E-Learning

A crucial component of a parasitologist's training is the ability to correctly identify the specific parasite that is contributing to animal or plant diseases. Digitized images from prepared slides of parasitic protozoa, helminths, and parasitic arthropods will be studied online (similar to a virtual microscope). In addition, traditional lab manuals which illustrate parasite diversity, structure and function will be placed on Course Reserve. Parasite cell, tissue and organ structure will be identified, described and related to functional adaptations of a parasitic lifestyle.

In addition, you will have a major enquiry-based group project (maximum 4 students/group). Details will be given in the next few weeks. Please form working groups within the next 2 weeks.

## Other Information

**Grading:** The grading scheme for the course conforms to the 9-point grading system used in undergraduate programs at York (e.g., A+ = 9, A = 8, B+ = 7, C+ = 5, etc.). Assignments and tests will bear either a letter grade designation or a corresponding number grade (e.g. A+ = 90 to 100, A = 80 to 90, B+ = 75 to 79, etc.)

(For a full description of the York grading system see the York University Undergraduate Calendar)

## Course Policies

- If you miss a test with a legitimate documented reason, only a "York Attending Physician's Statement Form" (can be downloaded as part of the Petitions Package) OR a similarly detailed doctor's note (i.e. not a form just stating that the student visited the clinic) will be accepted for medical excuses. The documentation should cover the date of the missed test. All documentation supporting your excuse for missing a test must be received by me by the beginning of next class. Students should contact me as early as possible after a missed test (within 24 hours). THERE WILL BE NO MAKE-UP TESTS. If you miss a test, you will receive a grade of zero for that test unless legitimate documentation (see above) is presented to me.
- Late assignments will be deducted 5% per calendar day
- If you believe that a written answer on a test was marked incorrectly, you must submit your (written) rationale and paper for remarking within 1 week of the test being made available to you. Only those answers written in ink will be eligible for remarking. Note: Remarking can result in the mark being raised, confirmed or lowered. In order to be fair and consistent with regards to the entire class, individual grades are not negotiable. I cannot provide "extra credit" assignments. Marks for assignments and tests will not be "rounded". Contact the course director about marks ONLY if there is a clear error in your mark (calculation, clerical, etc.) as soon as possible at smukai@yorku.ca. It is highly unlikely that you will receive a response regarding any other mark-related queries.
- DEFERRED STANDING: Students who do not write the exam during the December examination period, but have completed all other components and assignments by the scheduled dates, must submit a Deferred Standing Agreement (and relevant documentation) to the course director requesting permission to write a deferred exam (i.e., sign the Deferred Standing Agreement form). It is Senate Policy that "Normal requests for deferred standing must be communicated within one week following a missed examination, or on the last day to submit course work". Please check out the Registrar's Office Deferred Standing FAQs.

## University Policies

### Academic Honesty and Integrity

York students are required to maintain the highest standards of academic honesty and they are subject to the Senate Policy on Academic Honesty (<http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/>). The Policy affirms the responsibility of faculty members to foster acceptable standards of academic conduct and of the student to abide by such standards.

There is also an academic integrity website with comprehensive information about academic honesty and how to find resources at York to help improve students' research and writing skills, and cope with University life. Students are expected to review the materials on the Academic Integrity website at - [http://www.yorku.ca/spark/academic\\_integrity/index.html](http://www.yorku.ca/spark/academic_integrity/index.html)

### Access/Disability

York University is committed to principles of respect, inclusion and equality of all persons with disabilities across campus. The University provides services for students with disabilities (including physical, medical, learning and psychiatric disabilities) needing accommodation related to teaching and evaluation methods/materials. These services are made available to students in all Faculties and programs at York University.

Students in need of these services are asked to register with disability services as early as possible to ensure that appropriate academic accommodation can be provided with advance notice. You are encouraged to schedule a time early in the term to meet with each professor to discuss your accommodation needs. Please note that registering with disabilities services and discussing your needs with your professors is necessary to avoid any impediment to receiving the necessary academic accommodations to meet your needs.

### **Additional information is available at the following websites:**

Counselling & Disability Services - <http://cds.info.yorku.ca/>

Counselling & Disability Services at Glendon –

<http://www.glendon.yorku.ca/counselling/personal-counselling/what-is-counselling/>  
York Accessibility Hub - <http://accessibilityhub.info.yorku.ca/>

### **Ethics Review Process**

York students are subject to the York University *Policy for the Ethics Review Process for Research Involving Human Participants*. In particular, students proposing to undertake research involving human participants (e.g., interviewing the director of a company or government agency, having students complete a questionnaire, etc.) are required to submit an *Application for Ethical Approval of Research Involving Human Participants* at least one month before you plan to begin the research. If you are in doubt as to whether this requirement applies to you, contact your Course Director immediately.

### **Religious Observance Accommodation**

York University is committed to respecting the religious beliefs and practices of all members of the community, and making accommodations for observances of special significance to adherents. Should any of the dates specified in this syllabus for an in-class test or examination pose such a conflict for you, contact the Course Director within the first three weeks of class. Similarly, should an assignment to be completed in a lab, practicum placement, workshop, etc., scheduled later in the term pose such a conflict, contact the Course director immediately. Please note that to arrange an alternative date or time for an examination scheduled in the formal examination periods (December and April/May), students must complete an Examination Accommodation Form, which can be obtained from Student Client Services, Student Services Centre or online at [http://www.registrar.yorku.ca/pdf/exam\\_accommodation.pdf](http://www.registrar.yorku.ca/pdf/exam_accommodation.pdf)

### **Student Conduct in Academic Situations**

Students and instructors are expected to maintain a professional relationship characterized by courtesy and mutual respect. Moreover, it is the responsibility of the instructor to maintain an appropriate academic atmosphere in the classroom and other academic settings, and the responsibility of the student to cooperate in that endeavour. Further, the instructor is the best person to decide, in the first instance, whether such an atmosphere is present in the class. The policy and procedures governing disruptive and/or harassing behaviour by students in academic situations is available at - <http://secretariat-policies.info.yorku.ca/policies/disruptive-and-or-harassing-behaviour-in-academic-situations-senate-policy/>