**BIO 4320 – Medical Parasitology**

**Oakland University, College of Arts and Sciences, Biology**

# **Course Information**

**BIO 4320**, **CRN 45374**

**Fall 2018, MSC 102, 5.0 credit hours**

**Monday, Wednesday, and Friday (1:20-2:27), plus weekly lab periods (W 9:00-11:55; ODH 115)**

**September 5-December 8 (Exam Week December 10-15)**

**Course description**: Study of medically important protozoan, helminth, arthropod, and other organisms; their morphology, biology, clinical manifestations, pathogenesis, immunology, epidemiology and control. Includes laboratory methods of identification of medically important parasites. You must also be enrolled in Bio 4651, the companion lab for this course.

**Course format**: on-campus meetings

# **Instructor Information**

**Name: Dr. Thomas Raffel**

**Office Location**: 354 Dodge Hall (DHE)

**My office hours** are on Wednesdays 3:00-4:00 p.m. or by appointment.

**You can reach me** at 248-370-3551 or at raffel@oakland.edu

# **Learning Outcomes**

Students will be able to:

* Formulate testable hypotheses about parasitism and disease including graphical and numerical models
* Communicate scientific ideas to each other and to the instructor
* Work in collaborative groups to solve problems related to parasite biology, diagnosis, and control
* Critically evaluate scientific information about parasitic disease
* Recall essential facts about the biology, identification, and diagnosis of parasitic infections

# **Materials and Textbooks**

## Required Materials

* **i>clicker2®** (available in the OU Bookstore; an original **i>clicker®** may be used if you own one already)
* **SimUText Registration:** "How Diseases Spread" lab exercise ($5). Link available on Moodle.

## Required Texts

Copies of assigned papers and/or supplemental book chapters will be made available on Moodle at least two days prior to covering them in class. You are required to read assigned texts before class.

## Recommended Textbook

(other editions acceptable; textbook readings are recommended but not required)

Roberts, L., J. Janovy, and S. Nadler. 2013. *Foundations of Parasitology, 9th ed.* McGraw Hill Higher Education, ISBN 978-0-07-352419-1

# **Assignments and grade weight**

* 50% Lecture Exams (Exam 1: 12%; Exam 2: 16%; Final 22%)
* 10% Final Project Presentation (Individual assignment)
* 10% Final Project Report (Individual assignment)
* 20% Lecture Assignments
* 10% Participation (Attendance and Peer assessments)

**Assignments:** Written assignments will supplement lecture and lab activities. Most assignments will entail answering questions on handouts, but some will involve written reports. I will determine how many points each assignment is worth, and whether assignments will be graded credit/no credit or for a letter grade. All assignments are to be placed in your folder by the end of class on their due dates, unless otherwise stated. All regular assignments (aside from final reports) should be turned in on Assignment Check due dates, as paper-clipped packets.Each assignment should be completed, legible, and stapled for full credit. Electronic submission of assignments is acceptable with permission from the instructor. Excuses of “I had a problem with my printer” are unacceptable. I will deduct 10% from your grade for every day an assignment is late. Group assignment credit and Participation points will be determined in part by peer assessments of group member contributions.I reserve the right change the exam/assignment schedule at any time.

## Grading Scale

**GPA = (X%-50)/15+1**

* A range –Comprehensive, thorough coverage of all objectives, required content, critical and higher level thinking, original and creative, sound use of English skills, both written and oral
* B range –Competent, mastery of basic content and concept, adequate use of English
* C range –Slightly below average work, has met minimum requirements but with difficulty
* D range –Has not met requirements of assignment/course, has significant difficulties in many areas
* F – Has not completed requirements; has not officially withdrawn from course before drop date

## **Oakland University Grading Scale**

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| --- | --- | --- |
| Scale as of Fall 2018 | Minimum % | Old Scale |
| A | 93 | 4.0 |
| A- | 90 | 3.7 |
| B+ | 87 | 3.3 |
| B | 83 | 3.0 |
| B- | 80 | 2.7 |
| C+ | 77 | 2.3 |
| C | 73 | 2.0 |
| C- | 70 | 1.7 |
| D+ | 67 | 1.3 |
| D | 63 | 1.0 |
| F | < 63 | 0.0 |

# **Using Moodle**

Students must visit the BIO 465/565 site on [Moodle](https://moodle.oakland.edu/login/index.php) within the first week of class. Materials associated with class will be disseminated through Moodle. (Link to Moodle: moodle.oakland.edu)

# **Classroom and University Policies**

## **Laboratory Safety**

If you hurt yourself during a lab session, please see your instructor immediately for administration of first aid and to make a report of the injury. Students are expected to treat all laboratory specimens with respect, especially when dissecting vertebrates. Photography of laboratory specimens by students will not be allowed. All dissection specimens, slides, etc., are to remain in the lab. Anyone caught removing lab material will fail the course. Separate waste disposal bins will be provided for animal tissue and regular trash. I reserve the right to assign any student to remove biological waste from the regular trash.

## **Student Conduct**

1. [**In-Class Behavior**](https://www.oakland.edu/deanofstudents/policies/)**.** Be respectful of other students during class. If you arrive to class tardy, please enter the classroom as quietly as possible. Cell phone usage will not be tolerated during class for any reason. Refrain from talking while someone has the floor but please do not hesitate to participate when questions are asked. Students are not permitted to take notes or record lectures for the purpose of sale.
2. **Plagiarism.** Plagiarism will not be tolerated. Although you will be working in groups for many activities, you are required to do writing assignments independently and to acknowledge assistance where appropriate. Copying each other’s written work will be considered plagiarism and will result in being referred to the Academic Conduct Committee. For more information, review OU’s [Academic Conduct Regulations](https://www.oakland.edu/deanofstudents/conduct-regulations/). (Link to Academic Conduct Regulations: [https://www.oakland.edu/deanofstudents/policies/)](https://www.oakland.edu/deanofstudents/policies/%29)
3. [**Academic conduct policy**](https://www.oakland.edu/deanofstudents/policies/)**.** All members of the academic community at Oakland University are expected to practice and uphold standards of academic integrity and honesty. Academic integrity means representing oneself and one’s work honestly. Misrepresentation is cheating since it means students are claiming credit for ideas or work not actually theirs and are thereby seeking a grade that is not actually earned. Following are some examples of academic dishonesty:
	1. Cheating. This includes using materials such as books and/or notes when not authorized by the instructor, copying from someone else’s paper, helping someone else copy work, substituting another’s work as one’s own, theft of exam copies, falsifying data or submitting data not based on the student’s own work on assignments or lab reports, or other forms of misconduct on exams.
	2. Falsifying records or providing misinformation regarding one’s credentials.
	3. Unauthorized collaboration on computer assignments and unauthorized access to and use of computer programs, including modifying computer files created by others and representing that work as one’s own.

For more information, review OU’s [Academic Conduct Regulations](https://www.oakland.edu/deanofstudents/conduct-regulations/). (Link to Academic Conduct Regulations: https://www.oakland.edu/deanofstudents/policies/)

1. **Behavioral Code of Conduct**. Appropriate behavior is required in class and on campus. Disrespectful, disruptive and dangerous behavior are not conducive to a positive learning environment and may result in consequences. Core Standards for Student Conduct at OU includes
	1. Integrity. See academic conduct policy points above.
	2. Community. Policies regarding disruptive behavior, damage and destruction, weapons, and animals.
	3. Respect. Policies regarding harassment, hazing, and [sexual misconduct](https://www.oakland.edu/policies/health-and-safety/625/) (Link to Sexual Misconduct policy: https://www.oakland.edu/policies/health-and-safety/625/)
	4. Responsibility. Policies regarding alcohol, drugs, and other substances

See the[**Student Code of Conduct**](https://www.oakland.edu/deanofstudents/student-code-of-conduct/philosophy-and-purpose/)for details. (Link to Student Code of Conduct: https://www.oakland.edu/deanofstudents/student-code-of-conduct/philosophy-and-purpose/)

## **Accommodation and Special Considerations**

Oakland University is committed to providing everyone the support and services needed to participate in their courses. Students with disabilities who may require special accommodations should make an appointment with campus [Disability Support Services](https://www.oakland.edu/dss/) (DSS). If you qualify for accommodations because of a disability, please submit to your professor a letter from Disability Support Services in a timely manner (for exam accommodations provide your letter at least one week prior to the exam) so that your needs can be addressed. DSS determines accommodations based on documented disabilities. Contact DSS at 248-370-3266 or by e-mail at dss@oakland.edu.

For information on additional academic support services and equipment, visit the [Study Aids](https://www.oakland.edu/dss/study-aids/) webpage of Disability Support Services website. (Link to Disability Support Services website: https://www.oakland.edu/dss/)

## **Attendance policy**

Attendance is important for this course due to its emphasis on student participation and in-class assignments. Students who miss class will forfeit participation points awarded during that class period. If you must miss a particular class for an emergency or illness you must notify me within 24 hoursto avoid loss of participation points or to schedule a make-up exam. Upon your return, you must provide me with a note from your physician, etc., providing evidence of the reason for your absence. There are no scheduled makeup labs or exams**.** In the event that you miss an exam/quiz, I reserve the right to issue an alternative assignment/exam or to drop that score from your average. This will be handled on a case‐by‐case basis.

## **Excused Absence Policy**

This policy for university excused absences applies to participation as an athlete, manager or student trainer in NCAA intercollegiate competitions, or participation as a representative of Oakland University at academic events and artistic performances approved by the Provost or designee. A student must notify and make arrangements with the instructor in advance. For responsibilities and procedures see [Academic Policies and Procedures](https://www.oakland.edu/provost/policies-and-procedures/). (Link to Academic Policies and Procedures: https://www.oakland.edu/deanofstudents/conduct-regulations/)

## **Religious Observances**

Student should discuss with instructor at the beginning of the semester to make appropriate arrangements. Although Oakland University, as a public institution, does not observe religious holidays, it will continue to make every reasonable effort to help students avoid negative academic consequences when their religious obligations conflict with academic requirements. See The [OU Diversity Calendar](https://www.oakland.edu/diversity/calendar/) for more information. (Link to calendar: https://www.oakland.edu/diversity/calendar/)

## **Add/Drops**

The university policy will be explicitly followed. It is the student’s responsibility to be aware of [deadline dates for dropping courses](https://www.oakland.edu/registrar/registration/dropornot/) and officially drop the course. (Link to deadlines for dropping courses: https://www.oakland.edu/registrar/registration/dropornot/)

## **Emergency Preparedness**

In the event of an emergency arising on campus, the instructor will notify you of actions that may be required to ensure your safety. It is the responsibility of each student to understand the evacuation and “lockdown” guidelines to follow when an emergency is declared. These simple steps are a good place to start:

* OU uses an emergency notification system through text, email, and landline. These notifications include campus closures, evacuation, lockdowns and other emergencies. [Register for Emergency Notification](https://oupolice.com/). (Link to register for emergency notification: https://oupolice.com)
* Based on the **class cellphone policy**, ensure that one cellphone is on in order to receive and share emergency notifications with the instructor in class.
* If an emergency arises on campus, call the OUPD at **248-370-3331**. Save this number in your phone, and put it in an easy-to-find spot in your contacts.
* Review protocol for evacuation, lockdown, and other emergencies via the classroom’s red books (hanging on the wall) and at [Oakland University Police Department’s Emergency Management webpage](https://oupolice.com/em/). (Link to emergency management webpage: https://oupolice.com/em/)
* Review with the instructor and class what to do in an emergency (evacuation, lockdown, snow emergency).

# Tentative Course Schedule

Below is the tentative class schedule. I reserve the right to modify this schedule at any time. Some of the lab activities are dependent on obtaining fresh specimens, so it is necessary that we be flexible to accommodate unpredictable availability of these specimens.

## Week 1, September 2

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| **Topic:** Introduction to parasitology |  | **Recommended Reading:** Ch. 1 |

## Week 2, September 5-9

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| --- | --- | --- |
| **September 5 – Labor Day Recess** |  |  |
| **September 7 Topic:** Defining parasitism | **Assignments:** Raffel et al. 2008 TREE |  |
| **September 9 Topic:** Microparasites: Intro to Protozoa |  |  |

## Week 3, September 12-16

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| --- | --- | --- |
| **September 12 Topic:** Amoebae |  | **Recommended Reading: Ch.** 6 |
| **September 14 Topic:** Flagellates (Giardia, Trichomonas) |  | **Recommended Reading: Ch.** 7 |
| **September 16 Topic:** Trypanosomes |  | **Recommended Reading: Ch.** 5 |

## Week 4, September 19-23

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| --- | --- | --- |
| **September 19 Topic:** Leishmania |  |  |
| **September 21 Topic:** Coccidians |  | **Recommended Reading:** 8 |
| **September 23 Topic:** Malaria | **Assignments:** Assignment Check 1 | **Recommended Reading:** 9 |

## Week 5, September 26-30

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| --- | --- | --- |
| **September 26 Topic:** Modeling disease dynamics 1—microparasites |  | **Recommended Reading:** Poulin Ch. 7 |
| **September 28 Topic:** Modeling disease dynamics 2—microparasites |  |  |
| **September 30 Topic:** Diagnosis Problems & Review |  |  |

## Week 6, October 3-7

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| --- | --- | --- |
| **October 3 Topic:** EXAM 1 |  |  |
| **October 5 Topic:** Macroparasites: Intro to Flatworms |  | **Recommended Reading:** 13-15 |
| **October 7 Topic:** Trematode “flukes” |  |  |

## Week 7, October 10-14

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| --- | --- | --- |
| **October 10 Topic:** Trematoda - Schistosomiasis |  | **Recommended Reading:** Ch. 16 |
| **October 12 Topic:** Cestoda |  | **Recommended Reading:** Ch. 20, 21 |
| **October 14 Topic:** Paper Discussion – Flatworm sociality | **Assignments:** Hechinger et al. 2010 |  |

## Week 8, October 17-21

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| **October 17 Topic:** Immune System 1 |  | **Recommended Reading:** Ch. 3 |
| **October 19 Topic:** Immune System 2 |  |  |
| **October 21 Topic:** Paper discussion TBA | **Assignments:** Reading TBA |  |

## Week 9, October 24-28

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| **October 24 Topic:** Nematoda 1 | **Assignments:** Assignment Check 2 | **Recommended Reading:** Ch. 22-30 |
| **October 26 Topic:** Nematoda 2 |  |  |
| **October 28 Topic:** Nematoda 3 |  |  |

## Week 10, October 31-November 4

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| --- | --- | --- |
| **October 31 Topic:** Paper Discussion TBA | **Assignments:** Reading Assignment TBA |  |
| **November 2 Topic:** Evolution of parasitism |  | **Recommended Reading:** Poulin Ch. 2, 5 |
| **November 4 Topic:** Diagnosis Problems & Review |  |  |

## Week 11, November 7-11

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| --- | --- | --- |
| **November 7:** Exam 2 |  |  |
| **November 9 Topic:** Arthropoda 1—micropredators & ectoparasites |  | **Recommended Reading:** Ch. 33-34 |
| **November 11 Topic:** Arthropoda 2—disease vectors |  |  |

## Week 12, November 14-18

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| --- | --- | --- |
| **November 14 Topic:** “Other” parasites—parasite diversity |  | **Recommended Reading:** Ch. 10, 31, 32 |
| **November 16 Topic:** Host/parasite population dynamics |  |  |
| **November 18 Topic:** Modeling disease dynamics 3 – macroparasites |  |  |

## Week 13, November 21-25

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| **November 21 Topic:** Modeling disease dynamics 4 – macroparasites | **Assignment Check 3** |  |
| **November 23:** THANKSGIVING (No lecture today – only lab) |  |  |
| **November 23:** THANKSGIVING  |  |  |

## Week 14, November 28-December 2

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| **November 28 Topic:** Solving global health issues – Paper discussion |
| **November 30:** Group Presentations 1 |
| **December 2:** Group Presentations 2 |

## Week 14, December 5-7

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| **December 5:** Group Presentations 3 |
| **December 7:** FINAL EXAM 3:30-6:30 p.m. |