

LAB: Fish Diseases in Conservation Biology and Aquaculture
FW/MB 496/596

Credit hours: 2

Instructor: Dr. Jerri Bartholomew, Nash 524, phone 7-1856, email bartholj@science.oregonstate.edu and guest lecturers.

Course format: Meets once a week, 4 hours in lab

Office hours: by appointment

Prerequisites: MB 303 or other upper division laboratory course

Recommended text: None. Video on diagnostic methods will be available as supplemental material.

Course Structure: This laboratory complements lectures in FW/MB 491/591, with students learning: basic necropsy techniques; identification of bacterial, viral and metazoan pathogens; and molecular identification methods.

| Lab | Date | Lab Topic |
|-----|----------|--|
| 1 | April 1 | Anatomy, necropsy and sample collection |
| 2 | April 8 | Culture methods for bacterial pathogens |
| 3 | April 15 | Culture methods for viral pathogens |
| 4 | April 22 | SDL tour – Hematology 1 |
| 5 | April 29 | Identification of myxozoan parasites |
| 6 | May 6 | Identification of metazoan parasites |
| 7 | May 13 | Molecular tools in diagnostics 1 |
| 8 | May 20 | Molecular tools in diagnostics 2; Hematology 2 |
| 9 | May 27 | Open - Review |
| 10 | June 3 | FINAL |

Undergraduate student learning outcomes:

1. Acquire and demonstrate routine microbiological procedures such as using a bright-field microscope at 1000X magnification, preparing, staining and observing slides of microorganisms, using aseptic technique, and performing a streak plate.
2. Accurately report observations made during laboratory exercises.
3. Acquire ability to conduct and analyze experimental measurements relevant to diagnosis of fish diseases.
4. Evaluate a fish disease problem in the context of an unknown.

Graduate student learning outcomes:

In addition to the above learning outcomes for undergraduate students, by the end of this course, graduate students will be able to

1. Demonstrate understanding the role of recent breakthroughs in diagnostic methodology.
2. Describe the components of a comprehensive diagnostic procedures.

Learner Expectations:

1. Attend lab (on time) and stay until all lab exercises are completed.

2. Read laboratory exercises before they are to be performed.
3. Bring lab notebook and print-out of lab exercise to class.
4. Participate in learning activities and complete tasks on time.

Evaluation of student performance:

Undergraduate students

| | |
|---------------------------------|------------|
| Lab exercises (7 @ 15 pts each) | 105 |
| Lab practical | 150 |
| Attendance and participation | 45 |
| Total possible points | 300 |

Graduate students

Graduate students taking the course as 592 will be graded separately. Additional questions will be addressed in laboratory notebooks, including expectations for data analysis and synthesis.

Point Distribution

- A = 90 -100%
- B = 80 - 89%
- C = 70 - 79%
- D = 60 - 69%
- F = 0 - 59%

Make-up exams will be available to those with documented medical excuses or other documented emergencies. All make up exams will have written essays and/or oral components.

Format: Each lab will begin with a lead-in lecture about the principles for the exercises and demonstrations of new techniques. The **exercises must be read prior to class**, so that students will optimize their understanding and performance during the lab period and finish during the allotted time.

On some exercises you will work independently, while on others you will work in pairs. However, each student should perform their own observations, drawings, and write-ups on each of the exercises independently. The observations and data that you acquire in lab are to be documented in a spiral-bound lab book. Please feel free to ask questions when you do not understand a laboratory procedure. Good laboratory technique depends not only on knowing **what** you should be doing but **why** you should be doing it.

Lab coats: Lab coats are REQUIRED and each student must procure their own lab coat. You will not be able to attend lab without a lab coat. Space is provided if you want to leave your lab coat in the lab for the duration of the term.

Care of Valuables: Items of value should **not** be brought to the lab because of danger of theft or damage. Double-check your belongings at the end of the lab period to make certain you have not forgotten anything. The Department of Microbiology will not be responsible for any items brought to lab. Any materials supplied by the Department of Microbiology must remain in the laboratory.

LABORATORY SAFETY

- 1) **DO NOT** eat, drink or chew gum/tobacco. Open beverage and food containers must be left on the hallway shelf outside lab. Keep your hands out of your mouth, nose and

- eyes.
- 2) **KEEP YOUR WORKSPACE CLEAR** – Keep only the lab manual and necessary lab supplies on your bench top; everything else should be placed under the bench, keeping the aisles clear.
 - 3) **WEAR APPROPRIATE CLOTHING** – a lab coat and closed-toe shoes are REQUIRED.
 - 4) **NO UNAUTHORIZED VISITORS** in the lab. **NO ANIMALS** in lab.
 - 5) **KNOW THE LOCATION** of the fire extinguisher in the hallway and the fire blanket & eye wash in the lab.
 - 6) **CLEAN** desktop with **DISINFECTANT** at the beginning and end of class. Carefully wash hands with soap before leaving the lab.
 - 7) **BUNSEN BURNERS** in the lab have almost invisible flames - turn them off completely when finished. Long hair must be tied back during lab to avoid contact with flame. Loose fitting clothing and clothing or jewelry with dangling material should not be worn.
 - 8) **BROKEN GLASSWARE** - Call the instructor or TA to assist you. **Do not dispose of any glassware in the regular garbage cans.**
 - 9) **INJURY** - If you cut yourself in the lab, inform the instructor or TA so that the wound can be properly disinfected. If the injury needs professional assistance, you will be escorted to the Health Center or proper facility.
 - 10) **SPILLAGE** – If you spill anything in lab, inform the instructor or TA so that they can assist you in proper clean-up. If culture is spilled on your clothing or belongings, they may require decontamination to assure your safety.
 - 11) **INCUBATING** - Carefully label all materials to be incubated with your name/initials, seat number, and organism identification. Place materials to be incubated in the incubation tub at the front of your bench, unless otherwise directed.
 - a. Label culture plates on **agar side** with your name/initials, seat #, and organism identification. Place plates in incubation tubs agar side up, unless otherwise stated.
 - b. Label culture tubes on the **glass (not plastic caps)** with your name/initials, seat number, and organism identification. Place tubes in racks in incubation tub.
 - 12) **DISCARDING CLASSROOM MATERIAL** - All materials used in this class that are contaminated with culture (tubes, plates, pipettes, etc.) must be autoclaved before cleaning or disposal; DO NOT throw these materials away in the metal cans on your bench tops nor in the normal garbage cans.
 - a. **Used slides** should be cleaned with slide cleaner and returned to slide container.
 - b. **Used cover slips** go in the cardboard box for glass waste.
 - c. **Used razor blades/pins** go in the metal can for contaminated sharps.
 - d. **Plastic Petri plates, transfer pipettes, swabs and other 'soft' materials** go into an autoclave bag in a metal container ('coffin') on the discard table. Do not discard glass items in the autoclave bag!
 - e. **Glass culture tubes** go into wire baskets in metal containers ('coffins') at the discard table. **Glass Petri plates and bottles** go into metal containers ('coffins') at the discard table. Loosen screw caps before autoclaving.
 - f. **Uncontaminated** paper towels used to clean the bench top with disinfectant or lens paper used to clean microscopes can be placed in the metal container on the lab bench. The metal container should be emptied into the main garbage cans at the end of each lab session.
 - 13) **LEAVING THE LAB**
 - a. Have TA check your microscope.
 - b. Clear lab bench of all cultures, plates and other supplies.

- c. Empty the metal can containing uncontaminated 'soft' waste into a large garbage can.
- d. Clean desktop with disinfectant and wash hands with soap
- e. Make sure you have all of your belongings before leaving lab.

COURSE POLICIES

- **Lab safety/lab procedures:** You will be expected to follow the rules for laboratory safety & procedures described in detail on pages 8-10.
- **Missed labs:** Attendance is mandatory. **There are no make-up labs.** If you have more than 1 absence, you will receive an "I" if passing the course, an "F" if not passing the course. Arriving at lab more than 10 minutes late two times will affect attendance points.
- **Missed exams:** No make-up exams will be given. Missing the final exam will constitute a zero.
- **Lab Notebooks:** pages 6-7 describes expectations for the lab notebook.
- **Late Work:** all items are due the end of class on the Monday following the completion of the lab – Note: some labs take place over 2 weeks and thus are not due until data the following Mon. Items handed in after class and before 5 pm on that date due will have 20% subtracted. Items handed in by 5 pm the following day will have 50% subtracted. After that items will not be accepted.
- **Grading:** students have **2 weeks** from the time that notebooks are returned (or available for pick-up) to contest a score. Points will be updated on Canvas several times throughout the term. Check to make sure all your grades are recorded correctly. **If a grade is listed incorrectly or not posted, a student should contact me as soon as possible.**
- **Extenuating Circumstances:** exceptions to the course policies will be made only in the case of truly exceptional circumstances (serious illness, death in the family, car accident, etc) that are documented (i.e. doctor's note). The instructor retains the right to decide whether circumstances are extenuating or not.

UNIVERSITY HONESTY POLICY

The following information is summarized from the OSU Student Conduct Regulations <<http://oregonstate.edu/studentconduct/offenses-0>>:

Students are expected to be honest and ethical in their academic work. Academic dishonesty is defined as an intentional act of deception in one of the following areas:

- *cheating- use/attempted use of unauthorized materials, information or study aids
- *fabrication- falsification or invention of any information
- *assisting- helping another commit an act of academic dishonesty
- *tampering- altering or interfering with evaluation instruments and documents
- *plagiarism- representing the words or ideas of another person as one's own

When evidence of academic dishonesty comes to the instructor's attention, the instructor will document the incident, permit the accused student to provide an explanation, advise the student of possible penalties, and take action. The instructor may impose any academic penalty up to and including an "F" grade in the course after consulting with his/her department chair and informing the student of the action taken.

The goal of Oregon State University is to provide students with the knowledge, skill and wisdom they need to contribute to society. Our rules are formulated to guarantee each

student's freedom to learn and to protect the fundamental rights of others. People must treat each other with dignity and respect in order for scholarship to thrive. Behaviors that are disruptive to teaching and learning will not be tolerated, and will be referred to the Student Conduct Program for disciplinary action. Behaviors that create a hostile, offensive or intimidating environment based on gender, race, ethnicity, color, religion, age, disability, marital status or sexual orientation will be referred to the Affirmative Action Office.

Students with Documented Disabilities Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 541-737-4098.