

## Syllabus and Schedule

**Instructor:** Andrew Whiteley, Bioresearch Building (BRB) 004, [andrew.whiteley@umontana.edu](mailto:andrew.whiteley@umontana.edu)

**TA:** Sam Rosenbaum ([sam.rosenbaum@umconnect.umt.edu](mailto:sam.rosenbaum@umconnect.umt.edu))

**Office Hours:**

Whiteley: ([andrew.whiteley@umontana.edu](mailto:andrew.whiteley@umontana.edu)) Wednesday 2:00-4:00pm Bioresearch 004

Rosenbaum: by appointment

\*\*We are not always on email, please plan for a 24-hour delay, at the same time, be sure to check your UM email address for course announcements throughout the semester

**Meeting Time and Room:** To maximize the time we have for field activities, the schedule of this course will be a bit unusual. Here's how it will work: For weeks with no field activities, lecture will be held on both Tuesday and Thursday from 12:30-1:50pm in FOR 206. You will attend the lab section you signed up for on those weeks from 2:00-3:50pm in STONE 217. For weeks with field activities you will only come to class on one day that week. The day you attend the field activity is determined by the lab you signed up for. If you signed up for lab on Tuesday, the activity will be from 12:30 – 3:50 pm on Tuesday. If you signed up for lab on Thursday, the activity will be from 12:30 – 3:50 pm on Thursday. This will allow longer sessions on the days that we do field activities, so that we have sufficient time to travel and do the activities.

This course structure means that the course will last 10 weeks instead of the full semester.

**Here is the same information in table format:**

Type of Week	Sessions to attend	Location	Weeks this applies to
First week of class	Lecture (12:30 – 1:50pm)	Forestry 206	Week 1 (8/29, 8/31)
No field activity	Lecture (12:30 – 1:50pm Forestry 206) Lab (2:00 – 3:50pm, the day you signed up for)	Forestry 206 (lecture), Stone Hall 217 (lab)	Weeks 6 (10/5, 10/7), 8 (10/19, 10/21), 9 (10/26, 10/28), 10 (11/2, 11/4) 11(11/7, 11/9)
Field activity	Combined lecture and lab (12:30 – 3:50pm, only the day of your lab session)	TBA, usually outside Bioresearch to grab field equipment and head to vehicles	Weeks 2 (9/7, 9/9), 4 (9/21, 9/23), 5 (9/28, 9/30), 7(10/12, 10/14)
Final exam	Lecture (12:30 – 1:50)	Forestry 206	Week 11 (11/14)

**Text Book & App:** *Fisheries Techniques, Third Edition*. Zale, Parrish, and Sutton, editors. (scanned copies of chapters we read will be available on Moodle)

Other useful items: (1) Holton, C.J. and H.E. Johnson. 2003. Field Guide to Montana Fishes. 3<sup>rd</sup> Edition. Montana Fish, Wildlife, and Parks Helena, MT. or online at <http://fieldguide.mt.gov/>  
(2) New Fishes of Montana (Fish MT) app for smart phones and tablets (download free)

**Class Resources:** We will be using Moodle for the class (WILD 280.01). Go there for readings, class data sets, assignments, and announcements.

**Readings:** See syllabus for the reading schedule. Read chapters and papers for examples, applications, generalizations, and principles. Questions based on **lecture, activities, and reading material** will appear on the weekly quizzes and final exam.

**Course Description:** This course will provide an overview of fisheries techniques as they are applied in Montana. Students will learn methods commonly used to assess stream habitats, how to capture and handle fishes, how to estimate fish ages, how to estimate abundance, and factors that influence fish distributions. Case studies will expose students to current issues faced by fisheries managers in Montana. Field trips will provide hands-on experience.

#### **Learning Outcomes:**

1. You will learn field techniques used for sampling fishes in Montana
2. You will understand and be able to measure habitat requirements of Montana fishes
3. You will become familiar with the types of data encountered by fisheries biologists and professionals
4. You will learn about fisheries management and conservation issues in a specific river drainage in western Montana (Clark Fork River)
5. You will learn about the fishes found in western Montana

**Readiness Quizzes:** For some of the classes (six classes total, see syllabus) you will read some material and complete an online 'readiness' quiz on Moodle prior to class. These quizzes will take the place of a mid-term exam.

**Video Project:** you will complete a 5-minute edited video on a local fish natural history topic. A separate handout will be provided. Due 11/7 before class.

**Final Problem Set:** I will provide you with some data and ask you to answer questions and perform some analyses of those data to support your answers. The final project will be due at the end of the semester and will be in addition to the final exam. Expect to receive a data set, create several graphs, and interpret those graphs in the context of a fisheries issue managers currently face in the Clark Fork Basin. Due 11/17 by 11:59pm.

Final Exam: Tuesday November 14<sup>th</sup> from 12:30 to 1:50 in Forestry 206. **NO EARLY EXAMS WILL BE GIVEN**

**Class Policy:** Some of the field and lab projects will be done by teams of students so the resulting data are team or class property. Students are free to discuss results, **but all assignments must be prepared individually.** All written material, calculations and graphs to be handed in must be your own work (answers must be in your own words). All assignments must be submitted on time; penalties will be 5% of grade each day late unless other arrangements have been made.

**Missing Class:** If you need to miss a class, please get notes from another student, perform the readings, review the notes and then come into office hours with questions regarding the material. If you need to miss a field lab, please let me know in advance so we can attempt to accommodate your request. You will be held accountable for your absences through class attendance. Your attendance will contribute to your classroom participation score.

**Final Grade:**

Readiness quizzes 15%

Lab activities 30%

Final exam 20%

Final problem set 20%

Final video project 10%

Attendance and Participation 5%

**Field Lab Transportation:** Field activities are planned to be a relatively short drive up the Blackfoot River. They are approximately 30 min. by car from campus. Students are allowed to drive their own vehicles to any field trip, but need to communicate with the instructor at least 48 hours prior to the day of the field trip. Students who drive their own vehicles will not be reimbursed for mileage and are covered only by their own auto insurance. If students choose to drive together (car pool), please note the driver is liable for not only themselves but also the passenger (as with any private vehicle).

**Academic Honesty:** All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code. If students are caught cheating or plagiarizing on an assignment, they will get a zero for the assignment. If students are caught cheating on more than one assignment or on an exam, they will fail the course. More on the student conduct code can be found here: <https://www.umt.edu/student-affairs/community-standards/default.php>

**Procedures/policies accommodating disabilities:**

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and the Office for Disability Equity (ODE). If you anticipate or experience barriers based on disability, please contact the ODE at: (406) 243-2243, [ode@umontana.edu](mailto:ode@umontana.edu), or visit [www.umt.edu/disability](http://www.umt.edu/disability) for more information. Retroactive accommodation requests will not be honored, so please, do not delay. As your instructor, I will work with you and the ODE to implement an effective accommodation, and you are welcome to contact me privately if you wish.

### Grading policy:

Final letter grades will be assigned as follows:

A = $\geq 92\%$	A- = 89-91%	
B+ = 87-88%	B = 82-86%	B- = 79-81%
C+ = 77-78%	C = 72-76%	C- = 69-71%
D+ = 67-68%	D = 63-66%	D = 60-63%
F = $<60\%$		

### Registration, adding, and dropping classes:

Please see the registrar's website (<https://www.umt.edu/registrar/calendar/autumn.php>) for important dates restricting opportunities to drop a course for the Autumn 2023 semester.

### Lecture Schedule

Date	Lecture Topic and Readings (Subject to Change)
<b>Week 1</b> 8/29, 8/31 lecture	8/29: Introduction to fisheries in MT, goals for this course 8/31: Basics of freshwater fish sampling: snorkeling, electrofishing, kicknetting, gill netting; Safety
8/29, 8/31 lab	No lab this week (first week of classes)
<b>Week 2</b> 9/5, 9/7	<b>Field Week:</b> Kicknetting Clark Fork River, meet at UM practice fields by footbridge (near Kim Williams Trail)
<b>Week 3</b> 9/12, 9/14	no class (Andrew in the field in Nevada)
<b>Week 4</b> 9/19, 9/21	<b>Field Week:</b> Snorkeling <i>Meet between Health Sciences and Bioresearch Building</i> <i>Reading: A Temporary Refuge by Lee Spencer, Chapter 1</i> Online quiz completed before class <i>Assignment: Describe 3 observations from your time snorkeling or viewing fish underwater, each observation should be a short paragraph, due by 9/29 @ 5pm on Moodle</i>
<b>Week 5</b> 9/26, 9/28	<b>Field Week:</b> Electrofishing <i>Meet between Health Sciences and Bioresearch Building</i> <i>Reading: <a href="https://www.smith-root.com/support/kb/things-to-consider-when-electrofishing">https://www.smith-root.com/support/kb/things-to-consider-when-electrofishing</a></i> Online quiz completed before class <i>Assignment: Summarize data on your own, construct a data table and write one paragraph (we'll revisit these data later), due 10/3 before class</i>
<b>Sat. 9/30</b>	Optional weekend field trip. Meet at 9am at BioResearch Building
<b>Week 6</b> 10/3, 10/5 lecture	Habitat measurement <i>Reading: Fisheries Techniques 3rd ed.(FT3), Chapter 4 (focus on rivers and streams, not portions on lakes and reservoirs)</i> Online quiz completed before class
10/3, 10/5 lab	<i>Prepare for habitat assessment field activity: Supplemental reading for in-lab session (not part of quiz): Archer, E. K. et al. 2018. PacFish InFish Biological Opinion (PIBO) Monitoring</i>

	<p><i>Program. Effectiveness Monitoring Sampling methods for Stream Channel Attributes. US Forest Service.</i></p> <p><i>Form teams, present your habitat measurement protocol to the lab section, provide list of equipment you need in the field on 10/10 or 10/12</i></p> <p><i>FishMT database exploration for Gold Creek</i></p>
<b>Week 7</b> 10/10, 10/12	<p><b>Field Week:</b> Habitat measurements</p> <p><i>Write-up summarizing results due on 10/24</i></p>
<b>Week 8</b> 10/17, 10/19 lecture	<p>Fish tagging, Abundance estimation, Growth and movement of tagged fish</p> <p><b>Reading for Abundance Estimation:</b> FT3 part of Chapter 11: pp530 – 542 (sections 11.4.1 - 11.4.3, boxes 11.1 through 11.4 excluding 11.3)</p> <p><b>Readings for Fish Tagging:</b> FT3 Chapter 11 pp 521 – 530 (through section 11.3.3); PIT tags, radio tags, acoustic tags: FT3 Chapter 18 pp 825 - 838 (18.3.1 – 18.3.2.6)</p> <p><b>Growth and Movement of Tagged Fish:</b> Part of Chapter 11: pp557-563 (sections 11.6 and 11.7)</p> <p>Online quiz completed before class</p>
10/17, 10/19 lab	<p><b>Activities:</b> Work with electrofishing data, R-based depletion activity, Capture-Mark-Recapture</p>
<b>Week 9</b> 10/24, 10/26 lecture	<p>Age and Growth, length, weight</p> <p><b>Reading Age and Growth:</b> FT3, Chapter 15 pp 677-714 (up to but not including 15.4.3.4)</p> <p><b>Reading for Length, Weight, and Associated Indices:</b> FT3, Chapter 14 pp 637-656 (up to but not including 14.5.2)</p> <p>Online quiz completed before class</p>
10/24, 10/26 lab	<p><b>Activities:</b> Analysis of length data (length-frequency histograms), analysis of otoliths/scales (sockeye scale activity)</p>
<b>Week 10</b> 10/31, 11/2 lecture	<p>Genetics in MT Fisheries Management and Conservation</p> <p><b>Reading for Genetics:</b> Chapter 3 in <i>Conservation of Wildlife Populations, 3<sup>rd</sup> Edition</i>, Chapter entitled <i>Genetic concepts and tools to support wildlife population biology</i></p> <p>Online quiz completed before class</p>
10/31, 11/2 lab	<p><i>Activity: Fisheries genetics lab</i></p>
<b>Week 11</b> 11/7, 11/9	<p><i>Review for final, students show video projects (Video projects due)</i></p>
11/7, 11/9 lab	<p><b>Activity:</b> Data from kicknetting (data for way back in week 3)</p>
<b>Week 12</b> 11/14	<p><b>Final Exam</b> on Tuesday 11/14, will cover lectures, lab concepts, and readings from the entire semester. <b>Final project</b> is due on <b>11/17</b> at 11:59 pm (1 minute before midnight).</p>