**COURSE NAME:** Fish Physiology  
**COURSE NUMBER:** FW 476/576  
**TERM OFFERED:** Spring 2017  
**CREDITS:** 4 credits  
**INSTRUCTOR:** Allison Evans  
**INSTRUCTOR’S EMAIL:** allison.evans@oregonstate.edu

**COURSE DESCRIPTION**  
Physiological specializations and adaptations of major groups of fishes.

**Prerequisites:** FW 315

This course will give an overview of the varied physiological systems in fish. We will begin by investigating the nervous and endocrine systems, which allow fish to perceive and respond to its environment. The second portion of the course focuses on the physiological functions needed for survival (respiration, osmoregulation, feeding), and the third portion focuses on elements of homeostasis (hydromineral balance, buoyancy) and reproduction.

**COURSE DELIVERY**

This course will be delivered via Canvas where you will interact with your classmates and with your instructor. Within the course Canvas site you will access the learning materials, such as the syllabus, class discussions, assignments, projects, and quizzes. To preview how an online course works, visit the [Ecampus Course Demo](http://ecampus.gatech.edu). For technical assistance, please visit [Ecampus Technical Help](http://techsupport.gatech.edu).

**MEASURABLE STUDENT LEARNING OUTCOMES**

1. Identify different parts of the basic fish anatomy  
2. Explain the role of anatomy in various physiological functions  
3. Describe various physiological functions and how they relate to fish survival  
4. Compare how physiological functions differ among different fishes  
5. Synthesize and analyze the impacts of the environment on physiology

**COURSE STRUCTURE**

This course is simultaneously being delivered at the 400- and 500-level. This means that our class has both undergraduate and graduate students. Please note that your assignments will **differ** depending on which section you are taking. Read the syllabus carefully, as some assignments apply only to those enrolled at the **400-level** and some apply only to those enrolled at the **500-level**.
COURSE SCHEDULE

Week 1 (4/3):

Lectures: Course Introduction
Nervous System

Assignments:
- Discussion Board Assignment: Neurobiology

Required readings:
- Nervous system: pg 386 (starting with Functional Diversification) to pg 398 in Kotrschal et al. 1998. Fish brains: evolution and environmental relationships. Rev Fish Bio and Fisheries. 8:373-408.

Additional (optional) resources:
- Kotrschal et al. 1998. Fish brains: evolution and environmental relationships. Rev Fish Bio and Fisheries. 8:373-408.

Due Date
Post by Tuesday of Week 1
Comments by Sunday of Week 1
Sunday of Week 1

Week 2 (4/10):

Lectures: Sensory Systems

Assignments:
- Discussion Board Assignment: Sensory systems
- Weekly Assignment #2: Anatomy lab
- FW576 only: Research proposal check-in point #1

Required readings:

Additional (optional) resources:

Due Date
Post by Tuesday of Week 2
Comments by Sunday of Week 2
Sunday of Week 2
Post by Thursday of Week 2
Comments by Tuesday of Week 3

Week 3 (4/17):

This course is offered through Oregon State University Extended Campus. For more information, contact:
Web: ecampus.oregonstate.edu  Email: ecampus@oregonstate.edu  Tel: 800-667-1465
**Lectures:** Endocrinology & Stress Physiology (Videos)

**Assignments:**
- Discussion Board Assignment: Endocrinology and Stress
  
  Post by Tuesday of Week 3
  Comments by Sunday of Week 3

- FW476 only: Weekly Assignment #3: Protein lab
  Post by Sunday of Week 3

- FW576 only: Research proposal check-in point #1
  Comments by Tuesday of Week 3

**Required readings:**

**Additional (optional) resources:**

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**Week 4 (4/24):**

**Lectures:** Respiration and Metabolic Rate

**Assignments:**
- Discussion Board Assignment: Respiration or metabolic rate
  
  Post by Tuesday of Week 4
  Comments by Sunday of Week 4

- FW476 only: Weekly Assignment #4: pH and homeostasis lab
  Post by Sunday of Week 4

- FW576 only: Lecture check-in
  Post by Tuesday of Week 4

**Required readings:**
- None

**Additional (optional) resources:**

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**Week 5 (5/1):**

**Lectures:** Circulation

**Assignments:**
- Discussion Board Assignment: Circulation
  
  Post by Tuesday of Week 5
  Comments by Sunday of Week 5

- FW476 only: Weekly Assignment #5: Blood lab
  Post by Sunday of Week 5

- FW576 only: Research proposal check-in point #2
  Comments by Sunday of Week 5

**Required readings:**
- None

This course is offered through Oregon State University Extended Campus. For more information, contact:
Web: ecampus.oregonstate.edu     Email: ecampus@oregonstate.edu     Tel: 800-667-1465
Additional (optional) resources:

Week 6 (5/8):

Lectures: Feeding and Digestion
Assignments:
- Discussion Board Assignment: Feeding and digestion  
  Post by Tuesday of Week 6  
  Comments by Sunday of Week 6
- FW476 only: Weekly Assignment #6: Feeding and digestion  
  Sunday of Week 6
- MIDTERM EXAM  
  Available over several days

Optional readings:
- None

Additional (optional) resources:

Week 7 (5/15):

Lectures: Hydromineral Balance
Assignments:
- Discussion Board Assignment: Osmoregulation and/or acid/base balance  
  Post by Tuesday of Week 7  
  Comments by Sunday of Week 7
- FW576 only: Research proposal check-in point #3  
  Post by Tuesday of Week 7  
  Comments by Sunday of Week 7
- FW576 only: Draft of lecture due  
  Sunday of Week 7

Required readings:

Additional (optional) resources:  


Week 8 (5/22):

Lectures: Buoyancy
Assignments:
• Discussion Board Assignment: Buoyancy
• FW476 only: Weekly Assignment #7: Lecture Review

Required readings:

Additional (optional) resources:

Week 9 (5/29):

Lectures: Reproduction
Assignments:
• Discussion Board Assignment: Reproduction
• FW576 only: Final lecture due

Required readings:

Additional (optional) resources:

This course is offered through Oregon State University Extended Campus. For more information, contact:
Web: ecampus.oregonstate.edu  Email: ecampus@oregonstate.edu  Tel: 800-667-1465

Week 10 (6/5):

Lectures: Topics to be determined
Assignments:
• Discussion Board Assignment: Applications of physiology to fisheries management and conservation Post by Tuesday of Week 10 Comments by Sunday of Week 10

Required readings:

Additional (optional) resources:

Week 11 (6/12):

FINAL EXAM: Available over the course of several days.
COURSE MECHANICS

Assignment due dates
Your assignments must be turned in by 11:59 pm PST on the day listed in the schedule above. The calendar of assignments should be updated in Canvas, but if there is any conflict, the schedule above is the official schedule.

Readings
There is no required textbook for this course. Therefore, I have chosen different articles or book chapters from the literature for each week’s subject matter. The articles are available in Canvas in the appropriate weekly module in PDF format. Your understanding of the material presented in the lectures will be greatly enhanced by reading the required readings. Optional readings are listed for your own learning, either now or in the future.

Lectures
The weekly PowerPoint lectures are designed to be summaries of the major concepts for each week. They are not intended to be the entirety of what you need to know. Therefore, you should read the required readings and ask questions if anything in the readings is confusing. You are expected to be resourceful to promote your learning on each week’s subject and to recognize when to ask me for help in understanding a particular concept.

Discussions
Please read the Discussion Board instructions for information on the requirements for the discussion assignments and the marking scheme.

Weekly Assignments
In addition to the lectures, readings and discussion board, we will explore fish physiology through a series of labs. There are 7 weekly assignments. FW 576 students will participate in only the first two labs. For FW 476 students, four of the 7 labs are hands-on lab exercises, and the remaining 3 weekly assignments consist of one contribution to the course terminology wiki, one assignment related to laboratory skills, and one peer-review assignment. The weekly instructions in each module will contain the directions for each assignment. All weekly assignments will be handed in via Canvas.

Research Proposal and Lecture
Students enrolled in FW576 are required to complete a Research Proposal as well as a lecture. Graduate students will prepare both the research proposal and the lecture on subjects of their choosing, with the instructor’s approval. Further details and instruction for these projects can be found in the Research Proposal Instructions and the Lecture Instructions.

Exams
There will be one mid-term and one final for all students. Exams will be essay style (typically one page per question) and will cover information from lectures, labs and readings. Exams in this class are timed; if you exceed the time limit on an exam, you will be assessed a penalty of 10% for every five minute interval beyond the time limit.

Makeup Exams
Makeup exams will be given only for missed exams excused in advance by the instructor. Excused absences will not be given for airline reservations, routine illness (colds, flu, stomach
aches), or other common ailments. Excused absences will generally not be given after the absence has occurred, except under very unusual circumstances.

**EVALUATION OF STUDENT PERFORMANCE**

Please note that the grading composition is different for the 476 than for 576.

**FW 476**

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<th>Number of points in each category</th>
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**FW 576**

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**Grading Scale:**

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<tr>
<td>60-63% D-</td>
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COURSE POLICIES

Excused absences for an assignment
Students who miss any evaluation (quiz, assignment due date, etc.) for documented medical or other legitimate reasons will have their final grades pro-rated on the basis of completed evaluations. In other words, if a student has an excused absence from an assignment, that student’s grade will be calculated as if the missing assignment was never part of the course in the first place. This results in neither a penalty nor an advantage. The best policy for a potential conflict is to communicate with the instructor as early as possible to make appropriate arrangements. Work turned in after the due date for no legitimate reason and with no prior communication with the instructor will be marked as 0%.

Instructor Information & Communications
I am most easily reach by email (allison.evans@oregonstate.edu). You can also reach me by sending be a Canvas Inbox message (top right of Canvas). I will do my best to reply to all course-related questions and Inbox messages within 24 hours. I hope to create an atmosphere by which we can have constructive dialogue through the discussion boards and feedback on your assignments. Because this is a distance class, effective communication is very important. I will do my best to be clear in my communications of my expectations. Each of you can help by asking questions when you have them. Do not hesitate to ask a second time if my first answer is either not clear or needs additional explanation. General questions about assignments, due date, or other aspects of the class should be directed to the General Discussion Board. Please contact me directly by email with specific questions about feedback on your assignments or matters that do not concern the entire class. We do not have the advantage of being able to have a face-to-face discussion, so if you have questions, I will not know if you have a question about an assignment or my feedback unless you ask. Likewise, if you need to request an excused absence for an assignment, please contact me as soon as possible.

Incompletes
Incomplete (I) grades will be granted only in emergency cases (usually only for a death in the family, major illness or injury), and if the student has turned in 80% of the points possible (in other words, usually everything but the final paper). If you are having any difficulty that might prevent you completing the coursework, please don’t wait until the end of the term; let me know right away.

Statement Regarding Students with Disabilities
Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval please contact DAS immediately at 541-737-4098 or at http://ds.oregonstate.edu. DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations.

Expectations for Student Conduct
Student conduct is governed by the university’s policies, as explained in the Office of Student Conduct: Information and Regulations.
**Academic Integrity**

Students are expected to comply with all regulations pertaining to academic honesty. For further information, visit [Avoiding Academic Dishonesty](#), or contact the office of Student Conduct and Mediation at 541-737-3656.

OAR 576-015-0020 (2) Academic or Scholarly Dishonesty:

a) Academic or Scholarly Dishonesty is defined as an act of deception in which a Student seeks to claim credit for the work or effort of another person, or uses unauthorized materials or fabricated information in any academic work or research, either through the Student's own efforts or the efforts of another.

b) It includes:

(i) CHEATING - use or attempted use of unauthorized materials, information or study aids, or an act of deceit by which a Student attempts to misrepresent mastery of academic effort or information. This includes but is not limited to unauthorized copying or collaboration on a test or assignment, using prohibited materials and texts, any misuse of an electronic device, or using any deceptive means to gain academic credit.

(ii) FABRICATION - falsification or invention of any information including but not limited to falsifying research, inventing or exaggerating data, or listing incorrect or fictitious references.

(iii) ASSISTING - helping another commit an act of academic dishonesty. This includes but is not limited to paying or bribing someone to acquire a test or assignment, changing someone's grades or academic records, taking a test/doing an assignment for someone else by any means, including misuse of an electronic device. It is a violation of Oregon state law to create and offer to sell part or all of an educational assignment to another person (ORS 165.114).

(iv) TAMPERING - altering or interfering with evaluation instruments or documents.

(v) PLAGIARISM - representing the words or ideas of another person or presenting someone else's words, ideas, artistry or data as one's own, or using one's own previously submitted work. Plagiarism includes but is not limited to copying another person's work (including unpublished material) without appropriate referencing, presenting someone else's opinions and theories as one's own, or working jointly on a project and then submitting it as one's own.

c) Academic Dishonesty cases are handled initially by the academic units, following the process outlined in the University's Academic Dishonesty Report Form, and will also be referred to SCCS for action under these rules.