



Course Name: Fish Physiology

Course Number: FW 476/576

Credits: 4 credits

Instructor name: Tracey S. Momoda

Instructor email: tracey.momoda@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 functions of fish. We will begin by describing the nervous and endocrine systems, which allow fish to perceive and respond to its environment. The remainder of the course is then organized around the theme of physiological functioning needed to survive from immediate physiological concerns (respiration, osmoregulation), to more long-term issues such as growth and reproduction.

Communication

Please post all course-related questions in the General Discussion Forum so that the whole class may benefit from our conversation. Please email me directly for matters of a personal nature. In general, I will reply to course-related questions and email within 24-48 hours.

Technical Assistance

If you experience computer difficulties, need help downloading a browser or plug-in, assistance logging into the course, or if you experience any errors or problems while in your online course, contact the OSU Help Desk for assistance. You can call (541) 737-3474, email osuhelpdesk@oregonstate.edu or visit the [OSU Computer Helpdesk](#) online.

Learning Resources

Most of the course material will be available online through Blackboard. Lectures are best viewed as a slideshow in Microsoft Powerpoint. However, a .pdf version will also be provided in the event this is easiest for you to access. Assignments are posted in Microsoft Word format, therefore, access to a computer with Microsoft Office is necessary. Supplementary and background readings will be provided in .pdf format and accessible through Blackboard. A Perch dissection kit from Carolina Biological Supply must be purchased which is available through the OSU Bookstore.

Note to prospective students: Please check with the OSU Bookstore for up-to-date information for the term you enroll (<http://osubookstore.com/> or 800-595-0357). If you purchase course materials from other sources, be very careful to obtain the correct ISBN.

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

Blackboard

This course will be delivered via Blackboard where you will interact with your classmates and with your instructor. Within the course Blackboard 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](#). For technical assistance, please visit [Ecampus Technical Help](#).

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 function differs among fishes.
5. Synthesize and analyze the impacts of the environment on physiology

Evaluation of Student Performance

Component	
Online Discussion	15%
Weekly Assignments	20%
Midterm Exam	20%
Final Exam	25%
Final Project	20%

Course Content

Week	Topic	Readings	Learning Activities
1	Introduction, Fish anatomy & Nervous system	Kotrschal et al. 1998. Fish brains: evolution and environmental relationships. <i>Rev Fish Bio and Fisheries</i> . 8:373-408	Anatomy lab
2	Sensory systems	Moyle, P.B., and J.J. Cech. "Ch. 10 Reproduction" <i>Fishes: An Introduction to Ichthyology, 3rd Edition</i> . Ed. Prentice Hall, New Jersey. 2004. Pgs:140-156	Respiration/Metabolic rate laboratory & Online discussion
3	Endocrinology and Stress physiology	Wendelaar Bonga SE. 1997. The stress response in fish. <i>Physiol. Rev.</i> 77:591-625.	Blood sampling laboratory Online discussion
4	Respiration	Randall, D.J. "Gas Exchange in Fish." <i>Fish Physiology vol.IV: Nervous system, Circulation, and Respiration</i> , Ed. WS Hoar & DJ Randall. New York: Academic Press, 1969. pgs. 253-292	Protein laboratory Online discussion
5	Circulation	Randall, D.J. "The Circulatory System." <i>Fish Physiology vol.IV: Nervous system, Circulation, and Respiration</i> , Ed. WS	Research paper topic & outline Online discussion

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		Hoar & DJ Randall. New York: Academic Press, 1969. pgs. 133-172	
6	Cardiovascular system	Olson, K.R. & Farrell, A.P. "The Cardiovascular System." <i>Physiology of Fishes 3rd Edition</i> . Ed. D.H. Evans & J.B. Claiborne. Boca Raton: CRC press, 2004. pgs. 119-152	Online discussion Midterm Exam
7	Osmoregulation Acid/Base Balance	Moyle, P.B., and J.J. Cech. "Ch. 6 Hydromineral Balance" <i>Fishes: An Introduction to Ichthyology, 3rd Edition</i> . Ed. Prentice Hall, New Jersey. 2004.	Article review Online discussion
8	Feeding & digestion	Philips, A.R. Jr. "Nutrition, Digestion and Energy Utilization." <i>Fish Physiology vol. IV: Excretion, Ionic regulation & Metabolism</i> Ed. WS Hoar & DJ Randall. New York: Academic Press, 1969. pgs. 391-432	Article review Online discussion
9	Growth	Jobling M. "Bioenergetics: feed intake and energy partitioning." <i>Fish Ecophysiology</i> Ed. J.C. Rankin F.B. Jensen. New York: Chapman & Hall, 1993. pgs. 1-44	Article review Online discussion
10	Reproduction	Moyle, P.B., and J.J. Cech. "Ch. 9 Reproduction" <i>Fishes: An Introduction to Ichthyology, 3rd Edition</i> . Ed. Prentice Hall, New Jersey. 2004.	Online discussion Final Research Paper
Finals			Final Exam

Course Policies

Discussion Participation

Students are expected to participate in all graded discussions. You will need to participate in our discussions on at least two different days each week. Your first post should be done no later than Wednesday evening, and your second and third posts due by the end of each week. Please read the Discussion Board document in Course Documents for further information on grading.

Weekly Assignments

In addition to the lectures, readings and discussion board, we will explore fish physiology through some simulated labs and the primary literature. Assignments associated with these will be handed in via Blackboard by the assigned due date. Late assignments will be dropped a letter grade for each day overdue.

Lectures

The weekly PowerPoint's 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, I urge you to read the weekly readings as well as ask questions. You will be expected to be resourceful to promote your learning on each week's subject, outside of what is presented in the weekly lectures.

Readings

There is no required text for this course. Therefore, I have chosen different articles from the literature for each week's subject matter, which are available in Blackboard in .pdf format. Your understanding of the

material presented in the lectures will be greatly enhanced by reading the recommended literature. I may modify the selected readings during the term, but I will try not to substantially increase the amount.

Term Papers

Students enrolled in both FW 476 and 576 are required to complete a term paper. The topic of your project will be your choosing, with instructor approval. Undergraduates will write a research paper based on a few related articles from the primary literature. Graduate students will prepare a research proposal on a subject of your choosing, with instructor approval. Further details and instruction for these projects are listed under Course Documents in the Projects.docs file. Late term papers will dropped a letter grade for each day overdue.

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.

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.

Exam Time Limits

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.

Incompletes

Incomplete (I) grades will be granted only in emergency cases (usually only for a death in the family, major illness or injury, or birth of your child), 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 are collaborative efforts between students, faculty and [Disability Access Services \(DAS\)](#) 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.

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.

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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.

Conduct in this Online Classroom

Students are expected to conduct themselves in the course (e.g., on discussion boards, email postings) in compliance with the [university's regulations regarding civility](#).

Tutoring

[NetTutor](#) is a leading provider of online tutoring and learner support services fully staffed by experienced, trained and monitored tutors. Students connect to live tutors from any computer that has Internet access. NetTutor provides a virtual whiteboard that allows tutors and students to work on problems in a real time environment. They also have an online writing lab where tutors critique and return essays within 24 to 48 hours. Access NetTutor from within your Blackboard class by clicking on the Tools button in your course menu.

OSU Student Evaluation of Teaching

Course evaluation results are extremely important and are used to help me improve this course and the learning experience of future students. Results from the 19 multiple choice questions are tabulated anonymously and go directly to instructors and department heads. Student comments on the open-ended questions are compiled and confidentially forwarded to each instructor, per OSU procedures. The online Student Evaluation of Teaching form will be available toward the end of each term, and you will be sent instructions via ONID by the Office of Academic Programs, Assessment, and Accreditation. You will log in to "Student Online Services" to respond to the online questionnaire. The results on the form are anonymous and are not tabulated until after grades are posted.