GEACC

Projeto 2021

Responsáveis

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Informações

- *Pré-requisitos*: inglês e bom aproveitamento (por exemplo: mérito acadêmico ou índice de rendimento ≥ 7) em lógica, cálculo (I, II e III), álgebra linear, matemática discreta, estrutura de dados, algoritmos de pesquisa e ordenação, e programação (Java, C/C++ ou Python).
- A definir
- A definir
- A definir

Laboratório

Monitores

Sobre o GEACC

O *Grupo de Estudos Avançados em Ciência da Computação (GEACC)* é formado por alunos de Ciência da Computação (ou outra área relacionada) da FAESA Centro Universitário.

Objetivo

Estudar tópicos avançados em Ciência da Computação, principalmente relacionados a *matemática* (contínua, discreta e concreta), *algoritmos e estruturas de dados* (fundamentais e avançados) e *aplicações* (científicas, data science, machine learning e outras), com o objetivo específico de preparar os alunos participantes para alcançar nota ≥ 8.5 na prova POSCOMP de 2021 (o que corresponde a acertar pelo menos 60 das 70 questões da prova).

Material

Required Texts

Helfman, G.S., Collette, B.B., Facey, D.E., & Bowen, B.W. *The Diversity of Fishes: Biology, Evolution, and Ecology*. 2nd Edition. Wiley-Blackwell. 2009. ("DOF")

Recommended Text

Paxton, J.R. & Eschmeyer, W.N. *Encyclopedia of Fishes*. 2nd Edition. Harcourt Brace & Co. 1998.

Other

Any required journal articles and book chapters will be provided on Canvas.

Grading Scheme

15%	Review Paper
15%	Lab Worksheets
40%	Midterm Exams, 20% each
30%	Final Exam

Grades will follow the standard scale: A = 89.5-100; B = 79.5-89.4; C = 69.5-79.4; D = 60-69.4; F $<$60. Curving is at the discretion of the professor.

Review Paper

Students will choose a scientific article concerning a topic or species that we covered in class. For this assignment, you will write a summary of the paper and a review: strengths of the paper, things they could improve, perhaps any holes that they did not address, etc. You will then give your review to two classmates to independently review, and you will incorporate their edits into your final draft. You will turn in an abstract of the original paper, the two peer-reviewed copies of your review, the names of people whose papers you reviewed, and your final draft. 15% of your grade will depend on how thoughtfully and thoroughly you reviewed your peers' papers.

Learning Objectives

- Become familiar with the evolutionary history and taxonomic diversity of fishes
- Improve your understanding of the basic physiological and behavioral adaptations of fishes
- Gain skills regarding the dissection, collection, and preservation of fish specimens through laboratory work
- Learn to critically review a paper and summarize it, as well as review and provide helpful criticism to your peers' work

FAQs

Do we dissect real fish in this course?

Yes, we do actually dissect fish. If you know of any issues that may cause you difficulties during dissections, please notify your TA ASAP.

What is a fish?

No clue. When someone says 'fish', we have a picture of a general fish of a general shape in our minds, but the truth is that 'fish' doesn't have scientific meaning. Here's a funny video about that: Youtube (hyperlink).

What is your favorite fish?

A lumpsucker. They are incredibly, adorably weird-looking.

What's the difference between plural 'fish' and 'fishes'?

'Fish' is the plural form when talking about two or more fish of the same species. 'Fishes' is the plural when talking about two or more different species.

Make-up Policy

Make-up exams or assignments will only be allowed for students who have a substantiated excuse approved by the instructor *before the due date*. Leaving a phone message or sending an e-mail without confirmation is not acceptable. Labs are mandatory. Make-ups for missing a lab consists of a 1 paragraph summary of a recent fish-oriented journal article highlighted in the news AND a 4 minute power point presentation on the article to the class. Any additional missed labs will result in zero credit for that lab.

Diversity and Inclusivity Statement

I consider this classroom to be a place where you will be treated with respect, and I welcome individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability - and other visible and non-visible differences. All members of this class are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the class.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services at 555-5555 or theiremail@email.com, as soon as possible, to make an appointment to discuss your special needs and to obtain an accommodations letter. Please e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Academic Integrity

The University Code of Academic Integrity is central to the ideals of this course. Students are expected to be independently familiar with the Code and to recognize that their work in the course is to be their own original work that truthfully represents the time and effort applied. Violations of the Code are most serious and will be handled in a manner that fully represents the extent of the Code and that befits the seriousness of its violation.

Class Schedule

MODULE 1: Life's Building Blocks

Week 1	History of the Earth - Fish Remix	Friedman, M. & Salland, L.C. (2012). Five hundred million years of extinction and recovery: A Phanerozoic survey of large-scale diversity patterns in fishes. *Palaeontology*, 55(4):707-742
	Stem & Extant Agnathans & Gnathostomes	DOF Ch. 11, pp. 169-179; Ch. 13, pp. 231-240 Brazeau, M.D. & Friedman, M. (2015). The origin and early phylogenetic history of jawed vertebrates. *Nature*, 520(7548): 490-497.
Week 2	Chondrichthyans I: Overview & Sharks	DOF Ch. 11, pp. 197-200; Ch. 12, pp. 205-227
	Chondrichthyans II: Batoids & Chimaeras	DOF Chapter 12, pp. 227-229
Week 3	Stem & Extant Sarcopterygians	DOF Ch. 11, pp. 179-185; Ch. 13, pp. 242-248
	Actinopts I: Overview	DOF Ch. 14 & Ch. 15
Week 4	Actinopts II: Basal Actinopts & Teleostei	DOF Ch. 11, pp. 185-197; Ch. 13, pp. 248-259, Ch. 14, pp. 261-266
	Actinopts III: Otocephalan Fishes	DOF Ch. 14, pp. 267-275
Week 5	Actinopts IV: Freshwater Fishes	DOF Ch. 16, pp. 339-354; Ch. 18, pp. 410-414, 417-421
	Actinopts V: Deep Sea Fishes	DOF Ch. 18, pp. 393-401 Davis, M.P., Sparks, J.S., & Smith, W. L. (2016). Repeated and widespread evolution of bioluminescence in marine fishes. *PLOS One*.
Week 6	Actinopts VI: Coral Reef Fishes	Bellwood, D.R. & Wainwright, P.C. (2002). The History and Biogeography of Fishes on Coral Reefs. *Coral Reef Fishes: Dynamics and Diversity in a Complex Ecosystem*, 5-32.
	Actinopts VII: Pelagic Fishes	DOF Ch. 18, pp. 401-405
Week 7	Review	Module 1
	EXAM	MIDTERM 1

MODULE 2: What Makes a Fish

Week 8	Respiration	DOF Ch. 5
	Cardiovascular Systems	DOF Ch. 4, pp. 45-48
Week 9	Homeostasis	DOF Ch. 4, pp. 52; Ch. 7, pp. 101-105.
	Feeding Mechanisms	DOF Ch. 4, pp. 41-42; Ch. 8, pp. 119-126
Week 10	Sensory Systems	DOF Ch. 6
	Buoyancy	DOF Ch. 4, pp. 50-52 & Ch. 5, pp. 68-70
Week 11	Locomotion I - Undulatory Propulsion	Webb, P.W. (1984). Form and function in fish swimming. *Sci. Amer.*, 251(1): 72-83.

	Locomotion II - Oscillatory Propulsion	Daniel, T.L. (1984). Unsteady Aspects of Aquatic Locomotion. *Amer. Zoo.*, 24: 121-134.
Week 12	Communication & Reproduction	DOF Ch. 22, pp. 477-485
		DOF Ch. 21
	Review	Module 2
Week 13	EXAM	MIDTERM 2
	Holiday	Thanksgiving

MODULE 3: There Goes the Neighborhood

Week 14	Symbiotic Relationships	DOF Ch. 22, 492-497
	Behavior	DOF Ch. 23
Week 15	Ecology	DOF Ch. 25
	Conservation Efforts	DOF Ch. 26
Week 16	FINAL EXAM	Date & Time & Location

Lab Schedule

Week 2	Chondrichthyan Fishes	Students enjoy a two part lab: first, they examine specimens across the Chondrichthyan phylogeny; second, they dissect a small spiny dogfish shark.
Week 3	Harvard Natural History Museum	Students walk through the HMNH and the fossil collection, inspecting various fossil fishes.
Week 4	Basal Teleosts & Otocephalan Fishes	Students explore specimens across the basal Teleost phylogeny.
Week 5	Freshwater & Deep-Sea Fishes	Students explore specimens from a diverse group of fishes, and try to place each group in the broader phylogeny.
Week 6	Coral Reef & Pelagic Fishes	Students explore specimens from a diverse group of fishes, and try to place each group in the broader phylogeny.
Week 7	No Lab	
Week 8	Internal Systems	Students dissect fish specimens, probing and examing key internal systems.
Week 9	Jaw Dissections	Students again dissect their fish specimens, taking apart and visualizing the jaws of their fish.
Week 10	Sensory Systems & Buoyancy	Students again enjoy a two-part lab: first, examining a broad selection of specimens, comparing and contrasting sensory system apparatuses; and then conducting a series of small experiments to better understand the difficulties associated with buoyancy control in the water.
Week 11	Locomotion	Students dissect fish specimens, looking at muscular and structure of the body and fins. Students also participate in demonstrations designed to elucidate the concept of lift.
Week 12	Review Paper Projects	Students bring electronic devices and/or paper printouts of 2-3 paper choices, and will select peer reviewers. TAs will be available to assist students in choosing a paper and begin reviewing it.
Week 13	No Lab	
Week 14	No Lab	
Week 15	Final Exam Review Sessions	Review Paper Project Due