

PERSONAL GENOMICS AND MOLECULAR MEDICINE

PCB4717

Topics in Physiol/Biochem (Other)

Spring semester 2017

Class hours:

Tuesday 11-1:45

PCA 180

Office hours:

Monday 11-2 & Tuesday 10-11

(AHC4-311 or AHC4-385)

Prerequisites:

BSC1010, BSC1010L and BSC1011, BSC1011L

Instructor:

Jessica Liberles, Ph.D.

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COURSE DESCRIPTION

In the course Personal Genomics and Molecular Medicine, concepts related to genomic sequence data and key biomolecules are covered. With an emphasis on how mutations and small/large variation in the genome may lead to disease and how drugs may target these diseases, this course provides a gentle introduction to computational biology.

COURSE OBJECTIVES

The course Personal Genomics and Molecular Medicine aims to teach and discuss how genomics can inform our understanding of biology and disease in general. Students will become familiar with the main biomolecules and gain an understanding of how genomic variation can cause differences in disease susceptibility and learn how biomolecular function may change in response to a mutation. For further information, see the schedule below for a detailed outline.

In parallel to lectures and discussions, the class will have several smaller assignments that give insights to understanding biomolecules on their molecular and functional levels by gently introducing a concept of computational biology "in a laptop." Ultimately, students will perform a study on a specific disease, its current genetic testing protocol and drugs used for treatment.

Assignment focus

- ❖ Computational biology in a laptop?
- ❖ How do drugs work on the molecular level?
- ❖ Functional consequences of genetic variation?

Upon completing the class, students are expected to have a realistic understanding of the current state of personal genomics, how it can be used today, its promise for the future and potential scientific, technical, and ethical obstacles that must be overcome to get maximize the benefit of personal genomics. Students will have a basic understanding of molecular biology in order to perform easy computational biology investigations online or in a laptop and how to work with genomic data.

Required textbook: *Exploring Personal Genomics* by Dudley and Karczewski

Oxford University Press; First Edition (2013) ISBN-13: 978-0199644490

Further reading material will be distributed in class.

Laptop recommended but not required.

TENTATIVE SCHEDULE (Lectures & discussions)

Dates	Tuesday	
Jan 10 Jan 17*	The Molecular You DNA Proteins: Structure & Function The Central Dogma and Beyond	
Jan 24 Jan 31* Feb 7*	Test 1 (Jan 24) Molecular Evolution & Sequencing Personal Genomics & Genomic Variation	
Feb 14 Feb 21* Feb 28* Mar 7	Test 2 (Feb 14) Ancestry and Genealogy Resilience Visualizing Data & Cognitive Overload/ 1000 Genomes Project Genetic Trait associations Test 3 (Mar 7)	
*** SPRING BREAK ***		
Mar 21 Mar 28* April 4 April 11	Pharmacogenomics Are You Human? Antibiotics Personal Genomics and the Environment Current topics in Human Genomics Test 4 (April 11)	Project introduction Project Project presentations
April 18	Current topics in Human Genomics/Exam prep	
	FINAL's week	

*Assignment due

GRADING

	Percent		Percent
4 Tests (10p each)	40	Project – presentation and written portion	10
Assignments (6x5p) (Pass or Fail)	30	Final exam (100p)	20
<i>Extra credit opportunities</i>			

GRADE SCALE to be added**ABOUT THE CLASS**

1. **Be prepared and attend every class** – study the material covered. When the next class starts, what has already been covered is assumed knowledge. Stay up-to-date with assigned reading material and assignments.
2. **Test** means a written test or a discussion component based on previous lectures (same color code)
3. **Missed tests, presentations, deadlines, or exam** – provide valid documentation. If an exam or test falls on a religious holiday that you observe, let the instructor know as soon as possible.
4. You are expected to know the relevant parts of the **FIU student Handbook** that apply to you and oblige in appropriate behavior.
5. **Early Alert** – in an effort to help you succeed in your academic courses, FIU utilizes an Early Alert system. Instructors are now able to notify students' academic advisors if there are concerns about class performance. If an alert is submitted, your academic advisor will send you a message via your Student Dashboard (accessed via your MYFIU page) to discuss ways to improve your performance. Please respond to any communication you receive from your academic advisor about an early alert. Our goal with this program is to help you to be successful by identifying any issues as early on as possible and working to address them.

Syllabus is subject to change at the discretion of the professor