

COURSE SYLLABUS
Bioinformatics for Biologists (BSC4434 – undergraduate)

Last update: 8/21/16

Fall semester 2016

Class hours: Mon, Wed, Fri 11-11:50 (VH133)

Office hours: Wednesdays 12-1, Thursdays 10-1 (AHC4-311 or AHC4-385)

Prerequisites: BSC1010, BSC1011, PCB3063

Instructor:

Jessica Liberles, Ph.D. Department of Biological Sciences
email: jliberle@fiu.edu phone: 305-348-7508 office: AHC4-311, lab: AHC4-385

COURSE DESCRIPTION

Introduction to bioinformatic resources/methods for biologists. Accessing, searching, retrieving, and analyzing data, including sequence alignment, phylogenetic analysis, and protein structure prediction.

COURSE OBJECTIVES

Bioinformatics for biologists teach the theory behind fundamental bioinformatics methods while also guiding how to strategically apply these applications. Thus, this course has one theoretical part and one applied part each week. Project based learning is frequently used.

At the end of the course students are expected to be able to:

- Use bioinformatics tools to study biology
- Recognize how to apply different bioinformatics tools
- Describe common bioinformatics algorithms
- Define what data is needed for a certain question
- Critically analyze different bioinformatics tools and their results
- Discuss the results in a biological context
- Be familiar with peer-review and the importance of reproducible research

Students enrolled in Bioinformatics for Biologists will be assigned a small project to be presented in class focusing on a method, a protein or a disease.

PROJECT

For the project, groups of 3-4 students will form a research team and together investigate an assigned specific question using bioinformatics methodology. The project must be written up with

- A. an explanatory title
- B. brief introduction explaining the objective of the study
- C. detailed method sections that anyone with similar skills can reproduce the results
- D. present the results clearly in text and visually
- E. figures and tables must have a legend and be referred to in the text.
- F. discuss results and draw conclusion
- G. References

For draft 1, subdivide who does what and write a section each, compile, and first individually, and later as a group, review the group's entire document and summarize what must be improved (submit for grading and instructor feedback). Make the necessary improvements for Draft 2.

		Oct 21	Project launch	
Part 2	10	Oct 24	Project	Project related literature Draft 1: For within group feedback on each section including reproducibility Draft 2: For feedback from other group Peer review: is the writing sound, does the protocol work, anything missing or unclear? Project revision: Improve based on the peer review. Respond to peer review comments
		Oct 26	Project	
		Oct 28	Project	
		Oct 31	Systems biology	
	11	Nov 2	Project Draft 1 deadline	
		Nov 4	Project	
		Nov 7	Pathways, regulation, interactions	
	12	Nov 9	Project Draft 2 for peer review	
		Nov 14	Linear sequence predictions	
	13	Nov 16	Project	
		Nov 18	Project	
		Nov 21	Deadline for peer review	
	14	Nov 23	Project revision	
Nov 28		Project revision		
Nov 30		Applied test 2		
Dec 2		Project deadline		
15	Nov 28	Project revision		
	Nov 30	Applied test 2		
	Dec 2	Project deadline		
Finals week	16	Dec 7	Final 9:45-11:45 (or take home exam due Dec 6)	

GRADE SCALE

Grade	Points Per Credit Hour
A	4.00
A-	3.67
B+	3.33
B	3.00
B-	2.67
C+	2.33
C	2.00
D	1.00
F	0.00

ABOUT THE CLASS

1. **Be prepared and attend every class** – familiarize yourself with the material prior to class and study it after class.
2. Wednesdays marked with **Q** will have either a quiz or a discussion component based on previous lectures. The quizzes and discussions count towards your grade. There are 6 Q's, your lowest score will not be counted towards the Quiz grade.
3. **Learn to do bioinformatics** – the first part of the class will be at high pace and based on the textbook. The high pace is needed in order to build a foundation necessary for doing any type bioinformatics.
4. **Do bioinformatics to learn** – the second part is project based. Each student will perform an applied bioinformatics study aimed to learn about a specific protein or gene involved in disease or phenotype.
5. **Missed exams, tests, deadlines** – if you miss an exam, a test, or a deadline you must provide proper documentation in order to take the exam/test at a different time or to get an extended project deadline. If an exam falls on a religious holiday that you observe, let the instructor know during the first two weeks of class and the exam date will be changed.

6. **Focus!** – in the computer lab, we are doing bioinformatics and web searches must be appropriate to the topic. Phones are kept silent and out of sight (this is the default – if your specific situation necessitates incoming phone access during class, let the instructor know).
7. You are expected to know the relevant parts of the **FIU student Handbook** that apply to you (undergraduate or graduate) and oblige in appropriate behavior.
8. **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****