COLLEGE OF CHEMISTRY COURSE GUIDE (../INDEX.HTML)

MAJORS (../MAJOR.HTML) LIST OF COURSES (COURSES.HTML)

RESOURCES (../RESOURCES/RESOURCE.HTML)

STUDENT LIFE (../STUDENTLIFE/ORGS.HTML)

BIOE 131 - INTRODUCTION TO COMPUTATIONAL MOLECULAR AND CELL BIOLOGY (4 UNITS)

(Taken from the UC Berkeley Course Guide (http://guide.berkeley.edu))

COURSE OVERVIEW

SUMMARY

Topics include computational approaches and techniques to gene structure and genome annotation, sequence alignment using dynamic programming, protein domain analysis, RNA folding and structure prediction, RNA sequence design for synthetic biology, genetic and biochemical pathways and networks, UNIX and scripting languages, basic probability and information theory. Various "case studies" in these areas are reviewed; web-based computational biology tools will be used by students and programming projects will be given. Computational biology research connections to biotechnology will be explored.

PREREQUISITES

BIOE 11 (bioe11.html) or BIO 1A (bio1a.html) (may be taken concurrently), MATH 53 (math53.html)

Fall only

TOPICS COVERED

To introduce the biological databases and file formats commonly used in computational biology. (2) To familiarize students with the use of Unix scripting languages in bioinformatics workflows. (3) To introduce common algorithms for sequence alignment, RNA structure prediction, phylogeny and clustering, along with fundamentals of probability, information theory and algorithmic complexity analysis.

Students will be able to use knowledge from the lectures and lab sessions to write simple programs to parse bioinformatics file formats and execute basic algorithms, to analyze algorithmic complexity, to navigate and (for simple cases) set up biological databases containing biological data (including sequences, genome annotations and protein structures), and to use basic statistics to interpret results of compbio analyses.

WORKLOAD

TIME COMMITMENT

3 hours of lecture and 1.5 hours of laboratory per week.

UC Berkeley Course Guide (http://guide.berkeley.edu)

COLLEGE OF CHEMISTRY PEER SERVICES

Made by Angela Lee, c/o 2019



(https://w(https://withseduloupscom/canilsautyBhankterley.edu/ugrad/curr

lang=en) students/peer-

advising-

and-

. . • 、