COURSE TITLE/SECTION: Bioinformatics for Biologists BCHS 6397

TIME: Once a week, five hours

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I. Course

A. Catalog Description


B. Purpose

Optional statement that may expand the course description.

II. Course Objectives

Course objectives should begin with the following wording:

Upon completion of this course, students will be able to:

1. Edit molecular data
2. Manipulate formats
3. Search text data
4. Search literature data
5. Perform pair wise alignments
6. Perform multiple sequence alignments
7. Perform local alignments
8. Compute different genetic distances
9. Reconstruct phylogenetic trees
10. Test phylogenetic trees
11. Infer secondary structure of single stranded RNA
12. Infer tertiary structure of proteins
13. Analyze microarray data
14. Perform analyses pertaining to compositional characteristics
15. Use different packages for bioinformatic analysis
III. Course Content
Course content should be spelled out:

This course will include the following topical (content) areas:

1. Introduction. What is "Bioinformatics"?
2. Literature and text searches.
3. Introduction to biological data.
4. Sequences, (locus, accession, etc).
5. Introduction to BioEdit tool.
6. Pairwise Sequence Alignment.
7. Protein Scoring Matrices.
8. Multiple Sequence Alignment.
10. Synonymous and nonsynonymous distances and ratios
11. Similarity searches (BLAST, FASTA)
12. Introduction to Phylogenetic Trees
13. Methods of tree reconstruction
14. Tree testing
15. RNA 2D
16. Protein 3D
17. Proteomics
18. ExPASY
19. Microarrays
20. Genome analyses with emphasis on compositional characteristics

Final Project:

1. Consultation. Choice of subjects
2. Oral Pre-presentation. Class discussion
3. Oral presentation
4. Written presentation

IV. Course Structure
Lectures, hands-on practice, Independent work on a problem.

V. Textbooks
None.
Material provided online by the lecturer

VI. Course Requirements
Graduate standing
   A. Reading Assignments
B. Written Assignments
A written report must be submitted after each class

C. Projects (as needed)
The students is required to chose a research project, present an introduction in class and defend it, present the results in class, submit a written report.

D. Exams (as needed)
No written exams

VII. Evaluation and Grading

As long as students know how their grades will be computed, a grade distribution by points is optional on syllabus.

Performance in class, weekly written assignments, oral pre-presentation, oral presentation, written final report

Policy on grades of I (Incomplete): Provided something about incompletes is included in all syllabi the specific content is not mandated to be from GPS bulletin.

IX. Bibliography

Current references for students who are interested in pursuing additional information on course content.

Whenever possible, and in accordance with 504/ADA guidelines, the University of Houston will attempt to provide reasonable academic accommodations to students who request and require them. Please call 713-743-5400 for more assistance.