Syllabus: CS 5984
Algorithms in Bioinformatics
Fall, 2002

`http://courses.cs.vt.edu/~algnbio/index.php`

Instructor: Lenwood Heath

- **Office:** 638 McBryde Hall
- **Office Hours:** 8:00–10:00 AM Mondays and Wednesdays
- **EMAIL:** `heath@vt.edu`

Class Meets: Randolph 320, MW 2:30–3:45 PM

Exams

Midterm Exam	Monday, October 21, 2:30–3:45 PM
Final Exam	Monday, December 16, 1:05-3:05 PM

Index Number: 95799

Prerequisites:

- Data Structures (CS 2604) required
- CS 4104, Data and Algorithm Analysis, highly desirable
- **Corequisite:** PPWS 5984 — Biological Paradigms for Bioinformatics — or equivalent coursework in genetics and molecular cell biology

Textbook:

- *Computational Molecular Biology: An Algorithmic Approach,* Pavel A. Pevzner, MIT Press, 2000.

On Reserve:

For current list, see class web site.

Description

This course emphasizes algorithms to solve problems found in biology, especially molecular biology. A variety of current problems in computational molecular biology will be introduced, investigated, analyzed for computational complexity, and solved with efficient algorithms, when feasible. A number of such problems will be shown to be NP-complete or other evidence of their difficulty will be presented.

Grading Policy

Grading for the course is on a 1000-point scale, with the points distributed as follows:

Homework assignments: 12 at about 50 points each	600
Midterm exam: October 22, 1:25-2:15 PM	150
Final exam: December 16, 1:05-3:05 PM	250

A typical homework assignment consists of 2 or 3 problems or exercises, posted on the web site. All homework must be prepared with LaTeX or other word processing system and submitted as a stapled printout to a box outside the instructor's office (McBryde 638). Homework is due at 5:00 PM on the due date (see course calendar). **No late homework will be accepted.**

Ethics

The Honor Code applies. All work submitted must be the student's own work. Students may solicit help only from the instructor.

Announcement

If any student needs special accommodations because of a disability, please contact the instructor during the first week of classes.

Intended Topics

PEVZNER CHAPTER	TOPIC
13	Introduction to molecular biology
1	Introduction to computational molecular biology
2	Restriction mapping
3	Map assembly
4	Sequencing
5	DNA microarrays
6	Sequence comparison
7	Multiple sequence alignment
8	Probabilistic aspects of computational molecular biology
9	Gene prediction
10	Genome rearrangement
	Evolutionary distance and relationships
	Evolutionary or phylogenetic trees

End of Syllabus