Syllabus
CS 6104: Advanced Algorithms
Computational Biology

First Summer Session, 2000

Home page: `http://courses.cs.vt.edu/~cs6104/`

Instructor: Lenwood Heath

- **Office:** 638 McBryde Hall
- **Office Hours:** 11:00–12:00, Monday through Thursday
- **EMAIL:** `heath@cs.vt.edu`

Class Meets: McBryde 212, 9:30–10:45, Monday through Friday

Final Exam: None

Index Number: 61340

Prerequisites

- CS 4104 or CS 5114 or equivalent course in the analysis of algorithms

Description

This is an advanced topics course in computational biology. Specifics are in the topic list at the end of the syllabus.

Textbooks

S&M *Introduction to Computational Molecular Biology,* by João C. Setabal and João Meidanis, P W S Publishers, 1997.

SS&K *Computational Methods in Molecular Biology,* edited by Steven L. Salzberg, David B. Searls, and Simon Kasif, Elsevier, 1999.

Work in the Course and Grades

The work in the class consists of class participation, homeworks, being a scribe for class notes, and leading class discussion on at least one day and topic. The grade will be based 20% on class participation, 10% on scribe notes, 50% on homework, and 20% on leading class discussions.

Homework. There will be 5 small homework assignments, each due on a Tuesday. Assignments will be posted to the web site in LaTeX. Homework solutions must be prepared in LaTeX and may be submitted electronically to `cs6104@ei.cs.vt.edu` (just email the LaTeX source).

Scribes. In lieu of everyone taking notes, there will be a scribe appointed to take notes for each class. The scribe will summarize the class as an HTML file (see the template on the web site), which will be incorporated into the class web site. The instructor will do the first day.

Ethics

This is a collaborative course where everyone should be learning from the rest of the class. Collaboration is encouraged on all assignments. It is essential, however, to *acknowledge* the source for everything you turn in or present, whether that source is in the literature or is someone in the class. Also, *you* must prepare individually the homework you turn in, even if the solutions were obtained collaboratively with others.

Announcement

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

Class Days

May 22–26, 30–31; June 1–2, 5–9, 12–16, 19–23, 26–29

Tentative Schedule of Topics

DATES	S&M CHAPTER	SS&K CHAPTER	TOPIC
5/22–23	1		Introduction to molecular biology.
5/23–24	2	2	Computer science and biology.
5/25		1, 3	Challenges in computational biology.
5/26	7		Genome rearrangement (J.P.C. Vergara).
5/30–31	4	9	Fragment assembly.
6/1–6/2	5		Physical mapping.
6/5–6/9	3	3	Searching data bases. BLAST. FAST.
6/12–6/16		4, 10, 15	Hidden Markov models. Modeling sequences. Gene finding. Modeling biological data.
6/19–6/20		5, 6	Annotation.
6/21–6/23			Other topics, led by students.
6/26–6/29			Other topics, led by students.