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Fall 2012

CS 4810: Algorithms for Bioinformatics

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CS 4810

ALGORITHMS FOR BIOINFORMATICS

Fall, 2012

Meeting Time and Place

12:20 – 1:40 Monday and Wednesday 105 Bio Sci

Textbook

D. Krane and M. Raymer (2003), *Fundamental Concepts of Bioinformatics*, Benjamin Cummings, ISBN: 0-8053-4633-3

Instructors and Office Hours

Dr. Michael Raymer
391 Joshi
Office: 775-5110

michael.raymer@wright.edu
<http://www.wright.edu/~michael.raymer>
Office hours: Mon/Wed/Fri 2:30 – 3:30 pm,
or by appointment.

Dr. Dan Krane
225-B Bio Sciences
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Mobile: 241-9614

dan.krane@wright.edu
Office hours: Monday 9:00 – 9:30 am,
and Tuesday 9:30 – 10:30 am,
or by appointment.

Course Web Page

The course web page will be the primary method for distributing important announcements, course material, class notes, etc. Please check the page often. Login to the campus Pilot system using your CATS username and password. The URL is: <http://pilot.wright.edu>

You can find an archive of previous years' course materials at:
<http://birg.cs.wright.edu/cs471>

Grading

Course grades will be determined as follows:

Midterm Exams = 50 pts × 2 = 100 pts

Cumulative Final Exam = 100 pts

Term Project = 100 pts

Final grades will be based on the standard university-wide score divisions (i.e. 90%, 80%, 70%, etc.). However, the instructors may choose to curve the final grades upward, depending on the distribution of scores at the end of the term.

Policies & Notes

Joint Class Scheduling: Due to the semester conversion, CS 4810 is scheduled together with BIO 3810 for Fall 2012. Lectures will be held together, with some additional concepts presented for the 4810 students. In addition, students in 4810 will not do the homework assignments provided for 3810 students. Rather, they will conduct a research project on a topic relevant to the course material (Repeated DNA in Mammals). Each 4810 student will lead a project group and prepare a term paper describing their research results. More details on the term project requirements will be provided in subsequent course materials.

Collaboration: Discussion of the course contents with other students is an important part of the learning process. However, it is expected that graded course assignments will be completed *on an individual basis* unless the assignment states otherwise.

Students may not, under any circumstances, work together in actual implementation of any course assignment unless the assignment is specifically designated as a group project by the course instructors. Do not allow other students to view or copy your work. Sharing of work, including work from previous terms, is strictly disallowed. Copying or significant collaboration on any graded assignment will be considered a violation of university guidelines for academic integrity and reported to the Office of Judicial Affairs. The Code of Student Conduct can be viewed at <http://www.wright.edu/students/judicial/conduct.html> or a hard copy can be obtained from the Office of Student Judicial Services in the Student Union. If you have any questions about these policies, it is your responsibility to discuss them with the instructor of the course or a representative of the Office of Judicial Affairs as soon as possible.

If the same work is turned in by two or more students, all parties will be held equally accountable for violation of academic integrity. In other words, *you are responsible for ensuring that other students do not have access to your work*. If you suspect that your work material has been compromised, notify an instructor immediately.

Other notes: Students with disabilities or any additional needs are encouraged to set up an appointment at their convenience to discuss any classroom accommodations that may be necessary.

Tentative Lecture Schedule

Date	Topic(s)
Aug 27	Course introduction, biological chemistry – Dr. Krane (Ch. 1)
Aug 29	Sequence Alignments (Ch. 2) – How DNA changes over time, Dr. Raymer
Sept 3	<i>Labor Day – No classes</i>
Sept 5	Sequence Alignments (Ch. 2) – Algorithms, Dr. Raymer
Sept 10	Sequence Alignments (Ch. 2) – BLAST, Dr. Raymer
Sept 12	Multiple Alignments (Ch. 2) – Dr. Raymer
Sept 17	Substitution patterns (Ch. 3) – Dr. Krane
Sept 19	TERM PROJECT INTRO
Sept 24	TERM PROJECT DISCUSSION
Sept 26	Midterm Exam #1
Oct 1	Cluster analysis (Ch. 4) – Dr. Krane
Oct 3	Parsimony analysis (Ch. 5) – Dr. Krane
Oct 8	PAM matrices and Protein Alignments – Dr. Raymer
Oct 10	Genomics (Ch. 6) – Dr. Krane
Oct 15	Gene recognition (Ch. 6) – Dr. Krane
Oct 17	TERM PROJECT PROGRESS REPORTS
Oct 22	Elements of proteins structure (Ch. 7) – Dr. Raymer
Oct 24	Elements of protein structure , introduction to Fold-it (Ch. 7) – Dr. Raymer
Oct 29	Algorithms for protein folding (Ch. 7) – Dr. Raymer
Oct 31	Midterm Exam #2
Nov 5	Tools for protein visualization – Dr. Raymer
Nov 7	Enzyme kinetics (Appendix 2) – Dr. Krane
Nov 12	<i>Veterans Day – No classes</i>
Nov 14	Inhibitors and drug design (Ch. 8) – Dr. Krane
Nov 19	Protein classification (Ch. 8) – Dr. Krane
Nov 21	<i>Thanksgiving Break – No classes</i>
Nov 26	TERM PROJECT PROGRESS DISCUSSION
Nov 28	Repeated DNA – Fundamentals and applications, Dr. Krane
Dec 3	Forensic DNA evidence – Dr. Raymer
Dec 5	TERM PROJECT REPORTS
Dec 12	Final Exam: 12:30 – 2:30pm, 105 Bio Sci