



BMI 550/650

CS 510/610

Bioinformatics and Computational Biology I: Algorithms

Fall 2009
Course Syllabus

COURSE INSTRUCTORS:

David Maier, Ph.D., Maseeh Professor of Emerging Technologies, Department of Computer Science, Portland State University
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TIME AND LOCATION: Monday and Wednesday, 4-5:30pm, Center for Health and Healing (CHH) 3178, Room 5

TEXTBOOKS:

Required: Sung W-K. 2009. Algorithms in Bioinformatics: A Practical Introduction, Chapman & Hall/CRC. ISBN: 9781420070330

Note: We will be supplementing the textbook with lecture handouts and articles throughout the quarter.

Recommended:

For non-biologists: Brown, TA. Genomes 2nd Edition (available online)
<http://www.ncbi.nlm.nih.gov/books/bv.fcgi?rid=genomes.TOC&depth=2>

For non-computer scientists: Jones NC and P Pevzner. An Introduction to Bioinformatics Algorithms (Computational Molecular Biology) 2004

PREREQUISITES: Initial coursework in algorithms or consent of instructors.

COURSE DESCRIPTION: The course will be a problem-driven examination of the algorithmic and quantitative issues in computational biology. The course assumes basic background in algorithms. The emphasis is on algorithm development and application to biological problems, particularly those from functional genomics studies. Topics will include:

Mapping (Genetic linkage maps, physical maps), Sequencing (Whole genome sequencing: shotgun approaches and ESTs), Sequence analysis (multiple sequence alignment, fragment assembly, EST assembly, genome annotation, gene finding, BLAST), next generation sequencing, analysis of functional genomics data (gene expression, proteomics, chIP-chip).

METHODS OF EVALUATION: Students will be evaluated on written assignments and a final programming project.

ACADEMIC INTEGRITY: The students will be responsible for following the OHSU guidelines for academic integrity. You may discuss the general concepts and principles behind an assignment with other students. In fact, you are encouraged to do this whenever possible, because it is often a valuable way to reinforce ideas, and to learn new perspectives. However, in doing assignments, each student is expected to develop, write up, and hand in an individual solution and, in doing so, develop a sufficient understanding of the problem and solution so as to be able to explain it adequately to the instructor. *Under no circumstances should a student copy or consult the solution of another student, or copy a solution from any other source, including the Internet.*