



**BMI 550/650  
PSU CS 510/610  
Bioinformatics and  
Computational Biology  
I: Algorithms**

**Fall 2014, Course  
Syllabus**

**COURSE INSTRUCTOR:**

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**CO-INSTRUCTORS:**

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**TEACHING ASSISTANT:**

Poonam Sharma, Division of Bioinformatics and Computational Biology, Department of Medical Informatics and Clinical Epidemiology  
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**TIME AND LOCATION:**

Monday and Wednesday, 1-2:30, Center for Health and Healing (CHH) 3181 B

**TEXTBOOKS:**

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

**Reference Text:**

Pevzner P 2000. Computational Molecular Biology: An Algorithmic Approach. MIT Press. ISBN: 026216197

**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 multi-omics studies. This will enable the student to evaluate algorithms, as well as assess computational considerations for development and implementation. Topics include: global and local alignment, Scoring functions, suffix trees, Next Generation Sequencing Algorithms, Genome Alignment, Database search, Phylogeny, Multiple sequence alignment, motif finding, secondary structure, proteomics and genome rearrangements. In addition, we will discuss problem solving on large clusters and distributed systems.

**METHODS OF EVALUATION:** Students will be evaluated on written assignments, a mid-term exam and a final programming project.

Graduate Studies in the OHSU School of Medicine is committed to providing grades to students in a timely manner. Course instructors will provide students with information in writing at the beginning of each course that describes the grading policies and procedures including but not limited to evaluation criteria, expected time needed to grade individual student examinations and type of feedback they will provide.

Class grades are due to the Registrar by the Friday following the week of finals. However, on those occasions when a grade has not been submitted by the deadline, the following procedure shall be followed:

- 1) The Department<sup>1</sup> /Program Coordinator<sup>2</sup> will immediately contact the Instructor requesting the missing grade, with a copy to the Program Director and Registrar.
- 2) If the grade is still overdue by the end of next week, the Department<sup>1</sup> /Program Coordinator<sup>2</sup> will email the Department Chair directly, with a copy to the Instructor and Program Director requesting resolution of the missing grade.

- 3) If, after an additional week the grade is still outstanding, the student or Department<sup>1</sup> /Program Coordinator<sup>2</sup> may petition the Office of Graduate students for final resolution.

<sup>1</sup> For courses that are run by a specific department.

<sup>2</sup> For the conjoined courses (course number is preceded by CON\_ that are run by Graduate Studies.

**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.

See [http://www.ohsu.edu/xd/education/library/research-assistance/plagiarism.cfm?WT\\_rank=1#](http://www.ohsu.edu/xd/education/library/research-assistance/plagiarism.cfm?WT_rank=1#) for information on code of conduct for OHSU and <http://www.ohsu.edu/xd/education/teaching-and-learning-center/for-students/index.cfm> for more information on citing sources and recognizing plagiarism.

**STUDENT ACCESS:** OHSU is committed to providing equal access to qualified students with disabilities. Student Access determines and facilitates reasonable accommodations, including academic adjustments and auxiliary aids, for students with documented disabilities. A qualified student with a disability is a person who meets the academic and technical standards requisite to admission or participation in a particular program of study. As defined by the Americans with Disability Act (ADA), a person with a disability has a physical or mental impairment that substantially limits one or more major life activities of the individual. This may include, but is not limited to, physical conditions, chronic health issues, sensory impairments, mental health conditions, learning disabilities and ADHD. Student Access works with students with disabilities from all of OHSU's educational programs and at each campus.

Each school has an assigned Program Accommodation Liaison (PAL), who acts as an "in-house" resource for students and faculty concerning access issues for students with disabilities. The PAL works in collaboration with Student Access to implement recommended accommodations for students with disabilities.

It is recommended that you contact Student Access to consult about possible accommodations if you a) received disability accommodations in the past, b) begin experiencing academic difficulties, and/or c) are given a new diagnosis from your healthcare provider.

Learn more about Student Access:

Phone: 503 494-0082

Email: [studentaccess@ohsu.edu](mailto:studentaccess@ohsu.edu)

Website: [www.ohsu.edu/student-access](http://www.ohsu.edu/student-access)

**COPYRIGHT INFORMATION:** Every reasonable effort has been made to protect the copyright requirements of materials used in this course. Class participants are warned not to copy, audio, or videotape in violation of copyright laws. Journal articles will be kept on reserve at the library or online for student access.

Copyright law does allow for making one personal copy of each article from the original article. This limit also applies to electronic sources.

To comply with the fair use doctrine of the US copyright law, Sakai course sites close three weeks after grades are posted with the Registrar. Please be sure to download all course material you wish to keep before this time as you will have no further access to your courses.

#### **DMICE COMMUNICATION POLICY**

1. If the syllabus directs the student to contact the TA before contacting the instructor, the student should do so. Otherwise, the student should contact the instructor and allow 2 business days (not including weekends) for a response.
2. If the student does not receive a response from the instructor within 2 business days, s/he should contact the TA (if there is one). When contacting the TA s/he should cc the instructor and Diane Doctor at [doctord@ohsu.edu](mailto:doctord@ohsu.edu).
3. If a student does not receive a response from the TA within 1 business day (not including weekends), s/he should contact Diane Doctor at [doctord@ohsu.edu](mailto:doctord@ohsu.edu) and cc the instructor and the TA.
4. If Diane does not reply within 1 business day (not including weekends), the student should contact Andrea Ilg at [ilgan@ohsu.edu](mailto:ilgan@ohsu.edu).
5. Students having difficulties with Sakai should contact the Sakai Help Desk at [sakai@ohsu.edu](mailto:sakai@ohsu.edu) or at (877) 972-5249. Sakai help is available M-F from 8am to 10-pm and weekends from Noon to 5pm. Do not contact the instructor.