

**G4120: Introduction to Computational Biology**  
**Columbia University**  
**Department of Microbiology**  
**Fall 2009**

**Instructor:** Oliver S. Jovanovic, Ph.D.  
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**Location:** HHSC 1307  
**Day & Time:** Thursday, 1:00-2:30 P.M.  
**Credits:** 1

**Description:** This course will introduce graduate students to the concepts and methodology of computational biology, bioinformatics and genomics. It will introduce the databases, web sites, software, hardware, algorithms and programming languages currently used to analyze biological data and explain how these tools are best used.

**Prerequisites:** Previous or current graduate-level coursework in molecular biology and genetics, basic computer literacy.

**Technology:** A laptop computer with OS X 10.4.11 or later installed is recommended for the course, and should be brought to every session.

**Texts:** No required textbooks. Recommended texts include *Developing Bioinformatics Computer Skills* by Cynthia Gibas & Per Jambeck, *BLAST* by Ian Korf, Mark Yandell & Joseph Bedell and *Macintosh OS X Tiger Unleashed* by John Ray & William C. Ray.

**Website:** Additional course information and course files will be made available at <http://microbiology.columbia.edu/icb>

**Attendance:** Students are expected to attend all sessions of the course. In the event of an absence due to illness or an emergency, students are responsible for making up for the material covered in that session.

**Assignments:** Practical take-home work based on material covered in the sessions will be assigned throughout the course.

**Grading:** Pass/Fail. There will be no examinations, but all assignments must be completed to receive a passing grade.

**Notes:** Each session will consist of a lecture portion, followed by a hands-on computer session with a laptop. Involved questions should be saved for the end of each session, as the course will move quickly, but do not hesitate to ask questions in class if something is unclear or requires additional explanation.

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<b>September 17th, 1:00-2:30 P.M.</b>	Introduction to Computational Biology
<b>September 24th</b>	No class
<b>October 1st, 1:00-2:30 P.M.</b>	Introduction to Bioinformatics
<b>October 8th 1:00-2:30 P.M.</b>	Introduction to Macintosh OS X and Unix
<b>October 15th, 1:00-2:30 P.M.</b>	Introduction to DNA Analysis
<b>October 22nd, 1:00-2:30 P.M.</b>	Introduction to RNA Analysis
<b>October 29th, 1:00-2:30 P.M.</b>	Introduction to Protein Analysis
<b>November 5th, 1:00-2:30 P.M.</b>	Introduction to Internet Resources, Databases and Software
<b>November 12th, 1:00-2:30 P.M.</b>	Multiple Sequence Alignment and Phylogeny
<b>November 19th, 1:00-2:30 P.M.</b>	Genomics
<b>November 26th</b>	No class. Thanksgiving Day.
<b>December 3rd, 1:00-2:30 P.M.</b>	Introduction to Automation and Programming