Concentration Contract: Sc.B. in Computational Biology

Name_____   Graduation Year _____

General Instructions: fill this out as well as possible, then complete it with your concentration advisor and have her or him sign it. Put in *only* those courses used for the concentration. Put check marks in the boxes in the leftmost column for those courses that have been completed. Any changes to your contract must be initialed and dated by your advisor. The contract must be reviewed and reapproved yearly. (If there are no changes, review is still required, but approval is automatic.)

Completed		Will take when	Placement

Prerequisites

☐	MATH 0100 (Introductory Calculus II)	_____	☐
	or		
☐	MATH 0170 (Advanced Placement Calculus)	Fall _____	☐
☐	BIOL 0200 (The Foundation of Living Systems)	Spring _____	☐

General Core Requirements

Chemistry

☐	CHEM 0330 (Equilibrium, Rate and Structure)	Fall _____	☐

Biology

☐	BIOL 0470 (Genetics)	Fall _____	☐
☐	BIOL0 208 (Introduction to Biochemistry)	Spring _____	☐
	or		
☐	BIOL 0500 (Molecular Cell Biology)	Spring _____	☐

Computer Science

☐	CSCI 0150 (Intro to Object-Oriented Programming & Comp. Sci.) CSCI 0160 (Intro to Algorithms and Data Structures)	Fall _____ Spring _____	☐ ☐
	or		
☐	CSCI 0170 (CS: Integrated Approach I) CSCI 0180 (CS: Integrated Approach II)	Fall _____ Spring _____	☐ ☐
	or		
☐	CSCI 0190 (Programming with Data Structures and Algorithms)	Fall _____	☐
☐	CSCI 0220 (Intro to Discrete Structures and Probability)	Spring _____	☐

Probability and Statistics

☐	APMA 1650 (Statistical Inference I)	Fall _____	☐

Computational Biology Core Course Requirements

☐	CSCI 0810 (Computational Molecular Biology)	Fall _____	☐
☐	APMA 1080 (Statistical Inference in Molecular Bio and Genomics)	Spring _____	☐

Capstone Experience

Students enrolled in the computational biology concentration will complete a research project in their senior year under faculty supervision. The themes of such projects evolve with the field and the technology, but should represent a synthesis of the various specialties of the program. A minimum of one semester of independent study is required (such as BIOL 1950 or CSCI 1970), although many students may conduct a full year of independent study.

☐	_____	_____	☐

Honors

To be a candidate for honors, a student must have a course record judged to be excellent by the concentration advisor and must complete a thesis judged to be outstanding by the faculty member supervising the work.

Specialized Tracks

Students must complete six courses in one of the following four tracks:

Computational Genomics Track

Three of the following:

☐	CSCI 1230 (Introduction to Computer Graphics)	Fall _____	☐
☐	CSCI 1270 (Database Management Systems)	Fall _____	☐
☐	CSCI 1410 (Introduction to Artificial Intelligence)	Spring _____	☐
☐	CSCI 1550 (Probabilistic Methods in Computer Science)	_____	☐
☐	CSCI 1570 (Design and Analysis of Algorithms)	Spring _____	☐

or other CS courses approved by the concentration advisor.

Three of the following:

☐	CSCI 0310 (Introduction to Computer Systems)	Fall _____	☐
☐	CSCI 0320 (Introduction to Software Engineering)	Spring _____	☐
	or		
☐	CSCI 36 (Introduction to Systems Programming)	Spring _____	☐
☐	CSCI 1950-1 (Algorithmic Foundations of Computational Biology)	Spring _____	
☐	PHP 2620 (Statistical Methods in Bioinformatics)	Spring _____	☐
☐	APMA 1660 (Statistical Inference II)	Spring _____	☐
☐	BIOL 1430 (Computational Elements of Molecular Evolution)	_____	☐

Biological Sciences Track

At least four courses comprising coherent theme in one of the following areas:

1. Biochemistry
2. Ecology
3. Evolution
4. Neurobiology

Two courses from the following:

☐	CSCI 1950 (Algorithmic Foundations of Computational Biology)	Spring _____	☐
☐	PHP 2620 (Statistical Methods in Bioinformatics)	Spring _____	☐
☐	APMA 1660 (Statistical Inference II)	Spring _____	☐
☐	BIOL 1430 (Computational Elements of Molecular Evolution)	_____	☐

Molecular Modeling Track

☐	CHEM 1220 (Computational Tools in Biochemistry and Chemical Biology)	_____	☐

Four of the following:

☐	CHEM 1150 (Thermodynamics and Statistical Mechanics)	_____	☐
☐	CHEM 1230 (Chemical Biology)	_____	☐
	CHEM 1240 (Biochemistry) or		
☐	BIOL 1270 (Advanced Biochemistry)	_____	☐
☐	BIOL 0530 (Principles of Immunology)	_____	☐
☐	BIOL 1260 (Physiological Pharmacology)	_____	☐
☐	BIOL 1540 (Molecular Genetics)	_____	☐

Two of the following

☐	CSCI 1950 (Algorithmic Foundations of Computational Biology)	Spring _____	☐
☐	PHP 2620 (Statistical Methods in Bioinformatics)	Spring _____	☐
☐	APMA 1660 (Statistical Inference II)	Spring _____	☐
☐	BIOL 1430 (Computational Elements of Molecular Evolution)	_____	☐

Applied Mathematics and Statistical Genomics Track

Three of the following:

☐	APMA 1660 (Statistical Inference II)	Spring _____	☐
☐	APMA 1690 (Computational Probability and Statistics)	_____	☐
☐	CSCI 1410 (Introduction to Artificial Intelligence)	Spring _____	☐
☐	APMA 0340 (Methods of Applied Mathematics I) Or	_____	☐
☐	APMA 0330	_____	☐
☐	APMA 0360 (Methods of Applied Mathematics II) Or	_____	☐
☐	APMA 0350	_____	☐

At least three of the following:

☐	BIOL 1430 (Computational Elements of Molecular Evolution)	_____	☐
☐	CSCI 1950 (Algorithmic Foundations of Computational Biology)	Spring _____	☐
☐	PHP 2620 (Statistical Methods in Bioinformatics)	Spring _____	☐
☐	APMA 1070 (Quantitative Models in Biological Systems)	_____	☐

The above is my plan for meeting the degree requirements. It is my responsibility to make certain that all courses taken at Brown for concentration credit, all courses taken at other schools for which transfer credit has been approved for concentration credit and all AP credits appear on my transcript.

_____   _____
Student Signature   Advisor Signature

_____   _____
Date   Advisor Name (printed)

Reviewed and reapproved (at yearly meeting with concentration advisor):

_____   _____
Student Signature   Advisor Signature

_____   _____
Date   Advisor Name (printed)

Reviewed and reapproved (at yearly meeting with concentration advisor):

_____   _____
Student Signature   Advisor Signature

_____   _____
Date   Advisor Name (printed)