



Basic Info:

- MWF 2-2:50pm
- Briggs 119
- Course Webpage: <http://cs.rhodes.edu/welshc/CS342/S20>
- Prerequisites: COMP 241 or permission of the instructor, no biology is required.

Instructor:

- Catie Welsh
 - Office: Briggs 208
 - Email: welshc@rhodes.edu (please include “COMP 342” in the subject)
 - Office Hours: Tu/Thurs 10-11:30am, or by appointment

Book:

- An Introduction to Bioinformatics Algorithms by Neil C. Jones and Pavel A. Pevzner, MIT Press© 2004, ISBN: 0262101068. (optional, but highly recommended)

Course Description:

Computational methods are fueling a revolution in the biological sciences. Computers are already nearly as indispensable as microscopes for analyzing and interpreting biological data. As a result, two new multidisciplinary fields, bioinformatics and computational biology, have emerged. This course will explore the computational methods and algorithmic principles driving this revolution. It will cover basic topics in molecular biology, genetics, and proteomics. The course also addresses basic computational theory and algorithms including asymptotic notation, recursion, divide-and-conquer approaches, graph algorithms, dynamic programming, and greedy algorithms. These fundamental concepts from computer science will be taught within the context of motivating problems drawn from contemporary biology. Example biological topics include sequence alignment, motif finding, gene rearrangement, DNA sequencing, phylogeny, and gene expression analysis.

Workload:

- It is important to stay current with the material. You should be prepared to devote regular weekly hours to this course. Do not wait until the last minute to start your assignments.

Coursework:

- There will be 5-7 assignments consisting of both programming and written components. All programming will be in Python.
- You are allowed to use the course textbook and the course notes for these assignments. The use of any other material to solve the problem sets is forbidden; see Collaboration Policy.
- In-class labs will be a component of the course. These will be due by the start of the following class period. We will also be reading research papers throughout the semester and you may be asked to respond to questions about these before class.
- **Final Project:** The culminating event for the term will be a final project. I encourage you to work in pairs or small groups for this project. You will be responsible for a short oral presentation on your project during the final week of class. You will also turn in your complete final project (including written report) by Friday, May 8th at 5:30pm (our scheduled exam time).

Exams:

- There will be two exams:
 - Exam 1: Wednesday, February 26th, in class
 - Exam 2: Wednesday, April 22nd, in class

Grade Breakdown:

- 30% Assignments
- 10% In-class Labs/Reading Assignments
- 20% Final Project
- 20% Exam 1
- 20% Exam 2

Grade Assignments:

- Grading is based on the below scale:

| | | | |
|-------|-------------|-------|------------|
| ○ A : | [93%, 100%] | ○ C: | [73%, 77%) |
| ○ A-: | [90%, 93%) | ○ C-: | [70%, 73%) |
| ○ B+: | [87%, 90%) | ○ D: | [65%, 70%) |
| ○ B: | [83%, 87%) | ○ D-: | [60%, 65%) |
| ○ B-: | [80%, 83%) | ○ F: | [0%, 60%) |
| ○ C+: | [77%, 80%) | | |
- For borderline cases, I may take into account participation, and/or attendance, and improvement during the semester.

Attendance: Attendance is expected for each class as material that is not covered in the book may appear in class. If your attendance deteriorates, you will be referred to the dean and asked to drop the course. Attendance and participation may also be considered when assigning a final grade.

Makeups: If you have a valid reason for a makeup exam, inform your instructor as soon as you know. A valid reason is a medical emergency, a death in the family, religious observation, a college-sponsored on-campus activity, and, quite frankly, very little else. Generally, assignment extensions will only be granted for unplanned circumstances (e.g., the first two reasons above).

Students with Disabilities: If you have a documented disability and wish to receive academic accommodations, please contact the Office of Student Disability Services at x3885 as soon as possible.

Academic Integrity: Plagiarism, cheating, and similar anti-intellectual behavior are serious violations of academic ethics and will be correspondingly penalized. If you are concerned about a possible violation of this kind, please talk with me. I understand that being a student at Rhodes can be stressful sometimes and you will have many demands on your time. However, I would much rather have you turn in a partially-completed assignment or do poorly on a test than have you violate the Rhodes Honor Code. I can, and very much want to, help you if you don't understand the material, but violations of academic integrity will be dealt with harshly.

Unless otherwise specified, everything you submit in this course must be your own work and represent your individual effort. These are all included in the definition of reportable Honor Code violations for this course: copying all or part of a solution to a problem, downloading a solution from the internet and submitting it as your own, having someone else provide the solution for you, or allowing someone else to copy from you. If you have any doubt about what type of behavior is acceptable, please talk with me.

Collaboration policy: You may collaborate on the homework assignments to the extent of formulating ideas as a group, but you may not collaborate in the actual writing of solutions or code (unless that's explicitly allowed in the instructions). You must cite all sources, including websites and classmates from whom you obtained ideas (you do not need to cite the textbook or lecture material). *You may not consult any materials from any previous offerings of this course or from any other similar course offered elsewhere.*

You are required to completely understand any solution that you submit, and, in case of any doubt, you must be prepared to orally explain your solution to me. If you have submitted a solution that you cannot verbally explain to me, then you have violated this policy.

There is to be no collaboration whatsoever on any exams, unless otherwise specified. Policies for what constitutes acceptable reference material, if any, will be specified in detail when the exam is distributed.

To demonstrate that you have actually read this policy and understand it, send me an email with the title "Spaghetti Monster" before class on Friday of the first week of class. Those who do so will receive one extra credit point.

Diversity: A diverse learning community is a necessary element of a liberal arts education, for self-understanding is dependent upon the understanding of others. We are committed to fostering a community in which diversity is valued and welcomed. To that end any discrimination or harassment on the basis of race, gender, color, age, religion, disability, sexual orientation, gender identity or expression, genetic information, and national or ethnic origin, will not be tolerated in the classroom.

We are committed to providing an open learning environment. Freedom of thought, a civil exchange of ideas, and an appreciation of diverse perspectives are fundamental characteristics of a community that is committed to critical inquiry. To promote such an academic and social environment we expect integrity and honesty in our relationships with each other and openness to learning about and experiencing cultural diversity. We believe that these qualities are crucial to fostering social and intellectual maturity and personal growth.

Intellectual maturity also requires individual struggle with unfamiliar ideas. We recognize that our views and convictions will be challenged, and we expect this challenge to take place in a climate of open-mindedness and mutual respect.

Sexual Misconduct Disclosure: I will do my best to help any student who comes to me with non-course-related concerns. Please keep in mind, however, that all faculty members are mandated to report any incidents of sexual misconduct that comes to their attention. That means that I cannot keep information about sexual misconduct confidential from the college if you share that information with me, but the college has specific confidentiality and anti-retaliation protections in place.

The Rhodes Counseling Center or the Student Health Services Staff can advise you confidentially. Also, the Title IX Coordinator can help you access other resources on campus and in the local community.

The student policy is in the Student Handbook and it can be found on the web site at <http://handbook.rhodes.edu/title-ix>.

I reserve the right to alter this syllabus as necessary.