

Syllabus: CS 5046

Computation for the Life Sciences II

Spring, 2014

1 General Course Information

CRN	12260
MEETING TIME	8:00 AM–9:15 AM; Tuesdays and Thursdays
CLASSROOM	206 Randolph Hall

Instructor: Lenwood S. Heath

- **Office:** 2160J Torgersen Hall
- **Office Hours:** 9:30–11:30, Tuesdays and Thursdays
- **Email:** heath@vt.edu

Web Site: <http://courses.cs.vt.edu/cs5046/2014-spring/index.php>

Scholar: <https://scholar.vt.edu/>

Piazza: <http://www.piazza.com/>

Prerequisites:

- CS 5045, Computation for the Life Sciences I

Required Textbook: Programming in Python 3 (Second Edition). Mark Summerfield. Addison Wesley, 2010. ISBN: 978-0-321-68056-3.

Optional Textbook: Introduction to Programming Using Python. Y. Daniel Liang. Pearson Education, 2013. ISBN: 978-0-13-274718-9.

2 Course Description

This course is the second of a two-semester sequence intended for life science students needing an introduction to computer science. The course covers programming in the high-level language Python 3. Core topics in computer science are covered, including algorithms, complexity, software engineering and testing, and simple databases. Programming projects related to bioinformatics add value to the course.

3 Grading Policy

Grading for the course is on a 1000-point scale, with the points distributed as follows:

Homework assignments: 3 at about 100 points each	300
Programming projects: 5 at different point values	700

A typical homework assignment consists of 2 to 4 problems, posted on the course web site approximately one week before the due date.

All homework must be prepared with L^AT_EX¹ or other word processing system and submitted as a PDF to Scholar by 5:00 PM on the due date². **No late homework will be accepted.**

A programming project will be posted on the course web site one to two weeks before the due date. All files requested in the project description must be submitted as a tar or ZIP archive to Scholar by 5:00 PM on the due date. **No late projects will be accepted.**

4 Readings

For some classes, there is a reading assignment (see Section 7) to be completed by class time. Each assignment consists of sections in the textbook. Other readings may be assigned as the semester progresses.

5 Ethics

The Honor Code applies. All work submitted must be the student's own work. Students may solicit help only from the instructor or the teaching assistants.

6 Announcement

If any student needs special accommodations because of a disability, please contact the instructor during the first week of classes.

¹See L^AT_EX resources on the course web site.

²See Calendar on the course web site.

7 Course Schedule

DATES	READING ASSIGNMENT	TOPICS
JANUARY		
1/20–1/24	Chapter 1	Introduction to Python 3
1/27–1/31	Chapter 2	Simple data types in Python 3; discuss programming project 1
FEBRUARY		
2/3–2/7	Chapter 3	Collection data types in Python 3
2/10–2/14	Chapter 4	Control structures and functions in Python 3; discuss programming project 2
2/17–2/21	Chapters 5 and 6	Modules and object-oriented programming in Python 3
2/24–2/28	Chapters 7 and 8	File handling in Python 3
MARCH		
3/3–3/7	Chapter 9	Software engineering, testing, and debugging
3/10–3/14	SPRING BREAK	
3/17–3/21	Chapter 13	Regular expressions in Python 3; discuss programming project 3
3/24–3/28	Chapter 15; Liang Chapter 9	GUI programming with <code>tkinter</code>
3/31–4/4		Introduction to algorithms and complexity; sorting, searching, and hashing
APRIL		
4/7–4/11		Data structures; representing trees and graphs; discuss programming project 4
4/14–4/18		Dynamic programming
4/21–4/25		Searching graphs and minimum spanning trees; discuss programming project 5
4/28–5/2		Database principles
MAY		
5/6	Last Day of Class	Discussion of progress on programming project 5

END OF SYLLABUS