

**Point Loma Nazarene University**  
**CSC302 Python and UNIX Scripting (2 units)**  
**Spring 2016**

**Instructor:**

Dr. Lori Carter

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(619) 849-2352

office: RS 214

**Office hours:**

MWF 8:15-9:45, 1:00-1:30

TTh 10:30-12:00

**Course Time and Location:**

TR 9:30-10:20, RS 13

**Text:**

*Practical Computing for Biologists*, Haddock and Dunn.

**Additional Supplies:**

Raspberry Pi, Power Supply, Software (needed before Feb. 2 – see me if this is a financial hardship)

**Catalog Description**

An introduction to UNIX and Python scripting in the context of applications to scientific research. Students will become competent users of the UNIX operating system. They will learn to find and manipulate data from various file formats (including text, FASTA, HTML, XML) using regular expressions with UNIX and Python scripts. They will learn to use Python for data analysis and for more specialized purposes using third party modules including NumPy, BioPython, and Tkinter.

**Class Learning Outcomes:**

- Students will be able to write correct and robust software.
- Students will be able to apply their technical knowledge to solve problems.

**Course Organization:**

**Lectures:** Cover the highlights of chapters assigned – not a substitute for reading. Student versions of the lecture slides can be obtained from Canvas. These slides will contain suggested homework problems and due dates.

**Labs:** Lab assignments may be completed individually, or in pairs of 1 Math or CS student with 1 science student. If you are working in a group please turn in only 1 lab with both names and a statement indicating that you worked on the lab together (truly both of you together) signed by both parties. If it becomes apparent that 1 of the teams members is not learning the lab material, permission to work as a team could be revoked. **No late labs are accepted.** However, I will drop the lowest lab grade and you may turn in any unfinished lab on time for partial credit.

**3 minute interdisciplinary presentations:** The expectation is that **everyone will do at least one 3 minute presentation** with peers providing a ranking, comments, and a summary. The 3 minute presentation is a presentation on something in your discipline, directed to people not in your discipline, providing a “just enough” understanding of a topic in words they can understand. The presentation as well as the audience summaries will be graded. Your presentation will hold the weight of 3 summaries. The 2 lowest summary scores will be dropped.

**Quizzes:** In addition to the midterm and final exam, you will have 2 quizzes to help you keep current on both theory and practice. Quizzes are not cumulative. Quiz one (Feb. 4) covers material from the start of the course to the quiz, and quiz 2 (Apr. 7) will cover material following the midterm.

**Exams:** There will be 2 exams, a midterm and a final. If you will miss an exam for a school function, you must arrange to take it in advance. **If you ever miss an exam without giving me prior notice, there is a good chance you will receive a zero unless, of course, there was clearly an emergency.** Exam content can include material from lectures, the textbook, labs, and 3 minute presentations, and exams are cumulative. Exam 1 is scheduled for **Mar. 1**. It will cover chapters 1 – beginning of 8 in your textbook. Exam 2 is scheduled for **April 28** and will emphasize chapters 8-10 in your textbook plus labs and lecture material covered since the last exam. There will also be a take-home portion to the final exam that is due **Tuesday 10:30** of finals week.

The **final exam date** and time is set by the university at the beginning of the semester and may not be changed by the instructor. Only in the case that a student is required to take three exams during the same day of finals week is an instructor authorized to change the exam date and time for that particular student.

### Grading:

3 min. presentations	15%	Labs	35%
Midterm	15%	Quizzes	10%
Final Exam	25%		

Final grades will be determined as follows:

100-93%	A	80-82.9%	B-	67-69.9%	D+
90-92.9%	A-	77-79.9%	C+	63-66.9%	D
87-89.9%	B+	73-76.9%	C	60-62.9%	D-
83-86.9%	B	70-72.9	C-	0-59.9%	F

### University Mission:

Point Loma Nazarene University exists to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service becomes an expression of faith. Being of Wesleyan heritage, we aspire to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

### Department Mission:

The Mathematical, Information, and Computer Sciences department at Point Loma Nazarene University is committed to maintaining a curriculum that provides its students with the tools to be productive, the passion to continue learning, and Christian perspectives to provide a basis for making sound value judgments.

### Attendance:

Attendance is expected at each class session. In the event of an absence you are responsible for the material covered in class and the assignments given that day. Regular and punctual attendance at all classes in which a student is registered is considered essential to optimum academic achievement. Therefore, regular attendance and participation in each course are minimal requirements to be met. There are no allowed or excused absences except as approved in writing by the Provost for specific students participating in certain university-sanctioned activities. Excused absences still count toward the 10%-20% limits, but allow students to make up work, quizzes, or tests missed as a result of a university-sanctioned activity. Activities of a unique nature, such as labs or other activities identified clearly on the syllabus, cannot be made up except in rare instances when instructors have given advanced, written approval for doing so.

Whenever the number of accumulated absences in a class, for any cause, exceeds ten (10) percent of the total number of class meetings, the faculty member should send an e-mail to the student and the Vice Provost for Academic Administration (VPAA) warning of attendance jeopardy. If more than twenty (20) percent of the total number of class meetings is reported as missed, the faculty member or VPAA may initiate the student's de-enrollment from the course without further advanced notice to the student. If the date of de-enrollment is past the last date to withdraw from a class, the student will be assigned a grade of

W or WF consistent with university policy in the Grading section of the catalog. There are no refunds for courses where a de-enrollment was processed. For more details see the PLNU catalog:  
[http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278#Class\\_Attendance](http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278#Class_Attendance)

### **Class Enrollment:**

It is the student's responsibility to maintain his/her class schedule. Should the need arise to drop this course (personal emergencies, poor performance, etc.), the student has the responsibility to follow through (provided the drop date meets the stated calendar deadline established by the university), not the instructor. Simply ceasing to attend this course or failing to follow through to arrange for a change of registration (drop/add) may easily result in a grade of F on the official transcript.

### **Academic Accommodations:**

While all students are expected to meet the minimum academic standards for completion of their courses as established by the instructors, students with special needs may require academic accommodations. At Point Loma Nazarene University, students requesting academic accommodations must file documentation with the Disability Resource Center (DRC), located in the Bond Academic Center. Students can also reach the Disability Resource Center by phone at 619-849-2486 or by e-mail at [DRC@pointloma.edu](mailto:DRC@pointloma.edu). Once the student files documentation, the Disability Resource Center contacts the student's instructors and provides written recommendations for reasonable and appropriate accommodations to meet the individual needs of the student. This policy assists the university in its commitment to full compliance with Section 504 of the Rehabilitation Act of 1973, the Americans with Disabilities (ADA) Act of 1990, and ADA Amendments Act of 2008, all of which prohibit discrimination against students with special needs and guarantees all qualified students equal access to the benefits of PLNU programs and activities. For more details see the PLNU catalog:

[http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278#Academic\\_Accommodations](http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278#Academic_Accommodations)

Students with learning disabilities who may need accommodations should discuss options with the instructor during the first two weeks of class.

### **Academic Honesty**

The Point Loma Nazarene University community holds the highest standards of honesty and integrity in all aspects of university life. Any violation of the university's commitment is a serious affront to the very nature of Point Loma's mission and purpose. Violations of academic honesty include cheating, plagiarism, falsification, aiding academic dishonesty, and malicious interference. The details of PLNU's meaning of each of these words can be found in the PLNU catalog at:

[http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278#Academic\\_Honesty](http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278#Academic_Honesty)

A student remains responsible for the academic honesty of work submitted in PLNU courses and the consequences of academic dishonesty beyond receipt of the final grade in the class and beyond the awarding of the diploma. Ignorance of these catalog policies will not be considered a valid excuse or defense. Students may not withdraw from a course as a response to a consequence.

A student who is caught cheating on any item of work will receive a zero on that item and may receive an "F" for the semester. See the PLNU Catalog for a further explanation of the PLNU procedures for academic dishonesty ([http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278#Academic\\_Honesty](http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278#Academic_Honesty)).

### **Copyright Protected Materials:**

Point Loma Nazarene University, as a non-profit educational institution, is entitled by law to use materials protected by the US Copyright Act for classroom education. Any use of those materials outside the class may violate the law.

### **Credit Hour:**

In the interest of providing sufficient time to accomplish the stated course learning outcomes, this class meets the PLNU credit hour policy for a 2 unit class delivered over 15 weeks. Specific details about how the class meets the credit hour requirements can be provided upon request.

## Tentative Schedule

Mon	Tues	Wed	Thurs	Fri
	Jan 12 Mon schedule	13	14 Intro to Regular Expressions Ch 2 Regular Expression intro lab	15
18 MLK	19 3 min lat long More RegEx Ch 2-3 3 min on FASTA	20	21 3 min periodic tables & HTML more RE chapter 3	22
25	26 More Regular Exp – custom char sets, boundaries Ch 3	27	28 3 min: astronomical unit & magnetic field in nT Format conversion lab	29
Feb 1	2 3 min OS Intro Rasp pi Rasp Pi set up lab	3	4 <b>Quiz</b> Intro Linux/Unix chapter 4 Unix lab	5
8	9 3 min: CURL command Text in the shell (grep and reg ex) ch 5 3 min: IP address Grep/IP address lab	10	11 More unix Unix scripting chapter 6	12
15	16 More scripting chapter 6 Scripting lab	17	18 Start Python (Python day 1) Chapters 7,8 Download Python	19
22	23 More python ch 9 3 min: Codons, Amino Acids, Proteins	24	25 Python lab 2	26
Feb 29	Mar 1 Python lab 2 due <b>Exam</b>	2	3 3 min: DNA Melting, ORFs loops, lists, finding ORFs ch 9 ORF finding lab	4
7 Spring Brk	8 Spring Brk	9 Spring Brk	10 Spring Brk	11 Spring Brk
14	15 Python day 4 chapter 9 Dictionaries and menus Python Lab 4a	16	17 3 min: Restriction sites Python lab 4b	18
21	22 3 min: Mathematical sets set functions in Python ch 9-10	23	24 Easter	25 Easter
28 Easter	29 Python (split, files) Ch 10	30	31 RE's in python	Apr 1
4	5 Intro Turtle module	6	7 <b>Quiz</b> 3 min earthquake magnitude, turtle earthquake lab	8
11	12 3min image processing, Intro to numpy, image processing exercise	13	14 image processing lab	15
18	19 BLAST 3 min, biopython Approximate pattern matching	20	21 OS and other modules 3 min on other module	22
25	26 review	27	28 <b>Final Exam</b>	29
<b>Finals</b>	10:30 302 take home due			