Point Loma Nazarene University
CSC 302: Python and UNIX Scripting (2 units)
Spring 2017

Instructor:
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Office hours:
MWF 8:00-9:30, 1:00-2:00 TTh 10:45-11:45

Course Time and Location:
TR 9:30-10:45, RS 13

Text:
Practical Computing for Biologists, Haddock and Dunn.

Additional Supplies:
Raspberry Pi, Power Supply, Software (needed before Jan 31 – 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. If you are working in a group please turn in only 1 lab with both names. Doing so is a statement by you that you truly worked together. If it becomes apparent that 1 of the team's members is not learning the lab material, permission to work as a team could be revoked. Furthermore, **if your lab looks too similar to someone who is not your partner, both parties could receive a zero on that assignment.** Note that leaning too heavily on the help of a lab assistant could result in an assignment that looks too much like another's. **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 3 lowest summary scores will be dropped but your presentation score cannot be dropped. **Peer reviews will be completed via Canvas so please bring an internet-ready device to each class.** Summaries cannot be made up but a missed presentation can be given the next class period for ½ credit.

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 but may cover material from both lecture and lab. Quiz 1 (**Jan. 31**) covers material from the start of the course to the quiz, and quiz 2 (**Apr. 4**) will cover material following the midterm. **If you miss a quiz without giving me prior notice, there is a good chance you will receive a zero unless, of course, there was clearly an emergency.**

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. Exams are cumulative**.** The midterm is scheduled for **Feb 23.** It will cover chapters 1 – 6 in your textbook. The final exam is scheduled for **Thursday of finals week at 10:30** and will emphasize chapters 8-10 in your textbook plus labs and lecture material covered since the last exam.

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	15%
Final Exam	20%		

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

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. 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

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

Academic Honesty

Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. Academic dishonesty is the act of presenting information, ideas, and/or concepts as one's own when in reality they are the results of another person's creativity and effort. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for that assignment or examination, or, depending on the seriousness of the offense, for the course. Faculty should follow and students may appeal using the procedure in the university Catalog. See http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Academic_Honesty for definitions of kinds of academic dishonesty and for further policy information.

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.

CSC 302 Expected Schedule Spring 2017

Mon	Tuesday	Wed	Thursday	Fri
	Jan 10 Monday sched	11	12 Syllabus Sign up for 3 minute presentations Intro Regular Expressions (ch: 1 ,2) **3 min: Text editors**	13
16 MLK	17 More regular expressions (ch 2) **3 min latitude longitude** **3 min on FASTA**	18	19 Regular expressions (ch 3) **3 min: periodic tables** **3 min: HTML**	20
23	24 More Regular Exp – custom char sets, boundaries Ch 3 **3 min: Likert scale**	25	26 **3 min OS** **3 min Intro Linux/Unix** Intro Rasp pi	27
30	31 **Quiz on REs** Rasp Pi set up lab	Feb 1	2 Continue Raspberry Pi/ Linux lab	3
6	7 More Unix (ch 4, 5) **3 min: CURL command** **3 min: IP address**	8	9 Grep/IP address lab	10
13	14 More Unix Unix scripting chapter 6	15	16 Additional Scripting (beyond book) Study sheet for Exam available	17
20	21 Answer any questions for Exam Begin Python (chapter 7)	22	23 **Midterm exam** covering chapters 1-6	24
27	28 More python (chapter 8) **3 min: Codons, Amino Acids, Proteins** **3 min: taxonomic hierarchy**	Mar 1	2 More python (chapter 8) **3 min: DNA Melting** **3 min: ORFs** **3 min: Java functions**	3
6	7 Spring break	8	9 Spring break	10
13	14 More python (chapter 9)	15	16 More python (chapter 9) **3 min: Palindromes** **3 min: Blast** **3 min: probability**	17
20	21 Biological palindrome algorithm discussion (preparation for lab)	22	23 Python sets functions, files (ch 9) **3 min: Mathematical sets**	24
27	28 Introduce second part of major Python lab	29	30 Introduction to Turtle and Math modules (material outside of book)	31
Apr. 3	4 **Python Quiz**	5	6 **3 min: Sine, cosine, trajectory** **3 min: Earthquake magnitude** Biopython module, Turtle labs	7
10	11 **3 min: image processing** Introduction to image processing in Python using external modules	12	13 Easter	14 Easter
17 Easter	18 Continue with image processing	19	20 Image processing group work	21

24	25 Image processing group work	26	27 Image processing group work	28
May 1	2	3	4 Final exam 10:30	5