

CSC311 (1 unit) R for Computational Science

T 11:00-11:55 RS13

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Required Materials

R in Action, 2nd ed. Kabacoff, Robert I. 2015. ISBN: 9781935182399

R from R-project.org

R studio from Rstudio.com

Course Description

The software R will be introduced as a tool for numerical computation, visualization, and data analysis in science-related research. Various toolboxes will be explored. Students will gain experience in selecting and using the appropriate tool for the job.

Course Learning Outcomes

Students will be able to apply their mathematical knowledge to solve problems.

Students will be able to use technology to solve problems.

Students will be able to write correct and robust software.

Students will be able to apply their technical knowledge to solve problems.

Course Goals

Students will be able to construct a dataset, explore the data using basic numerical and visual summaries.

Students will be able to identify and implement the correct R tool for data analysis

Students will be able to find new packages and learn to implement new tools in R using the documentation.

Examinations

There will be one in class midterm and a final exam on **Thursday May 3, 2018 10:30-1:00.**

Labs and Homework

Learning a programming language requires hands on experience, so the primary component of your grade will be from weekly labs and homework assignments.

Project

Each student will submit a written report and code solving a real-world problem.

Grading Policies

Grades will be weighted in the following manner:

Final Project(30%), Labs and Homework (50%), Midterm (20%)

Approximate minimal percentages required to obtain a given grade are:

Grading Scale in percentages	A	B	C	D
+		(87.5, 90)	(77.5, 80)	(67.5, 70)
	[92.5, 100]	[82.5, 87.5)	[72.5, 77.5)	[62.5, 67.5)
-	[90, 92.5)	[80, 82.5)	[70, 72.5)	[60, 62.5)

- **Late work.** A written assignment or computer assignment is late if it is not received at the beginning of class on the due date. Late work will not be accepted. Make-up tests will be given only by arrangement with the instructor for reasons of documented emergency.
- **Format for Projects.** Assignments collected must be prepared in a style suitable for grading. The projects will be graded on clarity and writing quality.
 - the organization must be easy to follow
 - the work must be typed
 - complete solutions must be written for problems (not just answers); solutions must be clearly marked
 - use complete sentences to answer questions

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 is considered essential to optimum academic achievement. If the student is absent from more than 10 percent of class meetings, the faculty member can file a written report which may result in de-enrollment. If the absences exceed 20 percent, the student may be de-enrolled without notice until the university drop date or, after that date, receive the appropriate grade for their work and participation. See [Attendance Policy](#) in the Undergraduate Academic Catalog.

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:

If you have a diagnosed disability, please contact PLNU's Disability Resource Center (DRC) within the first two weeks of class to demonstrate need and to register for accommodation by phone at 619-849-2486 or by e-mail at DRC@pointloma.edu. See [Disability Resource Center](#) for additional information. For more details see

the PLNU catalog under [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 [the catalog](#) for definitions of kinds of academic dishonesty and for further policy information.

Final Exam: Thursday May 3, 2018 10:30-1:00pm

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. This schedule can be found on the university website and in the course calendar. No requests for early examinations will be approved. 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 consider changing the exam date and time for that particular student.

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 1 unit class delivered over 15 weeks. Specific details about how the class meets the credit hour requirements can be provided upon request.

Week	Topic	Chapter
1	1/16/2018 Getting started	Ch. 1
2	1/23/2018 Data and Data Structures	Ch. 2
3	1/30/2018 Graphing Basics	Ch. 3
4	2/6/2018 Working with Data, and dealing with missing data	Ch. 4 & 15
5	2/13/2018 Loops, conditionals, functions	Ch. 5
6	2/20/2018 Summaries and basic analysis	CH. 6 and 7
7	2/27/2018 Application Show and Tell	
8	3/13/2018 Exam 1	
9	3/20/2018 More exciting graphics	Ch. 11
10	3/27/2018 Graphics demos and more advanced graphics	Ch. 16
11	4/3/2018 Lab 8: It's a surprise	
12	4/10/2018 Project	
13	4/17/2018 Application Show and Tell	
14	4/24/2018 Project	
15	5/3/2018 Final / Project Due (10:30-1:00)	