

# Syllabus

 <p><b>POINT LOMA</b> NAZARENE UNIVERSITY</p>	<p><b>Mathematical, Information and Computer Sciences</b></p> <p><b>CSC3011 Machine Learning and Multivariate Modeling in R</b></p> <p><b>1 Unit</b></p> <p><b>Tuesday: 1:30-2:25 RS295</b></p> <p><b>Thursday: 1:30-2:25 Online</b></p>
<p>Spring 2022</p>	

**Instructor: Maria Zack, Ph.D.**

**Phone: 619.849.2458**

**Email: mzack@pointloma.edu**

**Office hours:**

On Zoom - [Click here for appointment \(https://calendar.google.com/calendar/selfsched?sstoken=UUphMmZJc2tIVTFKfGRIZmF1bHR8YTE5OTI3YWQxZDFhZDc4MDExZWQ5ZjU3MDRhNmNkNTI\)](https://calendar.google.com/calendar/selfsched?sstoken=UUphMmZJc2tIVTFKfGRIZmF1bHR8YTE5OTI3YWQxZDFhZDc4MDExZWQ5ZjU3MDRhNmNkNTI)

These are the times that I work to hold open for appointments. If none of them work you can email me to see if we can find another time.

Monday 8:00 - 9:30 AM & 2:30 - 3:30 PM

Tuesday 10:30 AM - 12:00 PM

Wednesday 7:00 - 8:00 AM

Thursday 3:00 - 4:00 PM

Friday 11:00 AM - 12:00 PM

## **PLNU Mission**

### **To Teach ~ To Shape ~ To Send**

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 is an expression of faith. Being of Wesleyan heritage, we strive 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.

## **COURSE DESCRIPTION**

CSC 3011 - Machine Learning and Multivariate Modeling in R (1)

Students will learn the fundamentals of modeling complex multivariate data, using both foundational regression and logistic regression techniques, as well as the basics of supervised and unsupervised machine learning approaches. Additionally, students will learn to assess model fit and how to select appropriate modeling tools to identify relationships in complex data sets. Along with hands on instruction, students will work on real applications from industrial applications in business and science.

Prerequisite(s): CSC 1043 or EGR 1043 with a grade of C- or better.

## **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.

## **REQUIRED TEXTS AND RECOMMENDED STUDY RESOURCES**

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

R from R-project.org

R studio from Rstudio.com

## COURSE CREDIT HOUR INFORMATION

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 fifteen weeks. Specific details about how the class meets the credit hour requirement can be provided upon request. (Based on 37.5 hours of student engagement per credit hour.)

## ZOOM SESSION EXPECTATIONS

- Treat this like any other class, and show up to the Zoom session on time.
- Turn on camera and make sure your camera is turned on for the entire length of the class.
  - If you need to have camera turned off an email **MUST** be sent to me prior to class otherwise I will consider this an unexcused absence.
  - Excused reasons for intermittent camera being off: need to use the restroom, needing to protect roommate.
- Participate with the class by unmuting OR using the chat.
- Make sure you are in a quiet space (when possible) free of distractions.
  - Students will not be considered present in class if they are driving a car, at work etc.
  - You should reserve this class time just like you would if you were face to face.

## ASSESSMENT AND GRADING

### Graded Components

- **R in the News Discussion:** One of the best ways to learn what can be done in R is to follow R in the media, you may want to subscribe to some community groups in LinkedIn or follow relevant R # in social media. I would suggest finding some that are relevant to your discipline. You should post a short summary of an interesting tool or project you have seen using R. The post should only be about a paragraph long. URLs where you found the original information is helpful.
- **Homework/Labs:** Learning a programming language requires hands on experience, so the primary component of your grade will be from weekly labs and homework assignments.
- **Final Project:** You will have a final project that you will present at the final (May 3rd at 1:30). There will be steps for leading up to the project during the semester and the last few weeks will be dedicated to working on the project.
- **No late work will not be accepted** without prior consent or a well-documented emergency. Up to a maximum of one homework assignment will be accepted up to 3 days late provided that consent is received from the professor before it is due. Homework assignments that are submitted late without prior consent will be recorded with a score of zero. If more than half of the homework assignments are submitted on time, then the lowest homework score will be dropped from the calculations of the homework grade.

- The examination schedule is included in the daily schedule. This instructor does not intend to accept excuses such as poor communication with parents, benefactors, surf team sponsors and/or travel agents. 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.

#### Point Distribution

Grading Distribution	Percent
R in the News	15
Homework/Labs	65
Final Project Preparation	5
Final Project	20
Total	100

#### Grading Scale

Grades are based on the number of points accumulated throughout the course. Approximate minimal percentages required to obtain a given grade are:

#### Grad Distribution

Standard Grade Scale Based on Percentages					
	A	B	C	D	F
+		87.5- 90	77.5-80	67.5-70	
	92.5 -100	82.5-87.5	72.5-77.5	62.5 -67.5	0-60
-	90-92.5	80-82.5	70-72.5	60-62.5	

## STATE AUTHORIZATION

State authorization is a formal determination by a state that Point Loma Nazarene University is approved to conduct activities regulated by that state. In certain states outside California, Point Loma Nazarene University is not authorized to enroll online (distance education) students. If a student moves to another state after admission to the program and/or enrollment in an online course, continuation within the program and/or course will depend on whether Point Loma Nazarene University is authorized to offer distance education courses in that state. It is the student's responsibility to notify the institution of any change in his or her physical location. Refer to the map on [State Authorization \(https://www.pointloma.edu/offices/office-institutional-effectiveness-research/disclosures\)](https://www.pointloma.edu/offices/office-institutional-effectiveness-research/disclosures) to view which states allow online (distance education) outside of California.

## INCOMPLETES AND LATE ASSIGNMENTS

All assignments are to be submitted/turned in by the beginning of the class session when they are due—including assignments posted in Canvas. Incompletes will only be assigned in extremely unusual circumstances.

## 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.

## PLNU COPYRIGHT POLICY

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.

## PLNU ACADEMIC HONESTY POLICY

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 [ADC Academic and General Policies \(https://catalog.pointloma.edu/content.php?catoid=48&navoid=2757#Academic\\_Honesty\)](https://catalog.pointloma.edu/content.php?catoid=48&navoid=2757#Academic_Honesty) for definitions of kinds of academic dishonesty and for further policy information.

During the first week of class, you will be asked to submit an Academic Honesty Verification Statement. Submitting the statement is a requirement of this course. By submitting the Academic Honesty Verification Statement, you will be verifying all assignments completed in this course were completed by you. Carefully review the Academic Honesty Statement below.

Statement: "In submitting this form, I am verifying all the assignments in this course will be completed by me and will be my own work."

## PLNU ACADEMIC ACCOMMODATIONS POLICY

PLNU is committed to providing equal opportunity for participation in all its programs, services, and activities. Students with disabilities may request course-related accommodations by contacting the Educational Access Center (EAC), located in the Bond Academic Center ([EAC@pointloma.edu](mailto:EAC@pointloma.edu) (<mailto:EAC@pointloma.edu>) or 619-849-2486). Once a student's eligibility for an accommodation has been determined, the EAC will issue an academic accommodation plan ("AP") to all faculty who teach courses in which the student is enrolled each semester.

PLNU highly recommends that students speak with their professors during the first two weeks of each semester/term about the implementation of their AP in that particular course and/or if they do not wish to utilize some or all of the elements of their AP in that course.

Students who need accommodations for a disability should contact the EAC as early as possible (i.e., ideally before the beginning of the semester) to assure appropriate accommodations can be provided. It is the student's responsibility to make the first contact with the EAC.

## PLNU SPIRITUAL CARE

Please be aware PLNU strives to be a place where you grow as whole persons. To this end, we provide resources for our students to encounter God and grow in their Christian faith. If students have questions, a desire to meet with the chaplain or have prayer requests you can contact the [Office of Spiritual Development](https://www.pointloma.edu/offices/spiritual-development) (<https://www.pointloma.edu/offices/spiritual-development>)

## PLNU ATTENDANCE AND PARTICIPATION POLICY

Regular and punctual attendance at all **synchronous** class sessions is considered essential to optimum academic achievement. If the student is absent for more than 10 percent of class sessions (virtual or face-to-face), the faculty member will issue a written warning of 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. In some courses, a portion of the credit hour content will be delivered **asynchronously** and attendance will be determined by submitting the assignments by the posted due dates. See [Academic Policies](https://catalog.pointloma.edu/content.php?catoid=46&navoid=2650#Class_Attendance) ([https://catalog.pointloma.edu/content.php?catoid=46&navoid=2650#Class\\_Attendance](https://catalog.pointloma.edu/content.php?catoid=46&navoid=2650#Class_Attendance)) in the Undergraduate Academic Catalog. If absences exceed these limits but are due to university excused health issues, an exception will be granted.

## PLNU USE OF TECHNOLOGY

In order to be successful in the online environment, students need to meet the minimum technology and system requirements; please refer to the [Technology and System Requirements \(https://help.pointloma.edu/TDClient/1808/Portal/KB/ArticleDet?ID=108349\)](https://help.pointloma.edu/TDClient/1808/Portal/KB/ArticleDet?ID=108349) information. If a student is in need of technological resources please contact [student-tech-request@pointloma.edu \(mailto:student-tech-request@pointloma.edu\)](mailto:student-tech-request@pointloma.edu)

*Problems with technology do not relieve students of the responsibility of participating, turning in assignments, or completing class work.*

Monday	Tuesday	Wednesday	Thursday	Friday
10-Jan <b>BUSINESS DAY</b>	11-Jan	12-Jan	13-Jan Zoom: Class Orientation	14-Jan
17-Jan <b>MLK DAY</b>	18-Jan Stats Labs 1, 2, and 3	19-Jan	20-Jan Zoom: Group Problem Solving	21-Jan
24-Jan	25-Jan Stats Labs 4 and 5	26-Jan	27-Jan Zoom: Group Problem Solving	28-Jan
31-Jan	1-Feb Stats Labs 6 and 7	2-Feb	3-Feb Zoom: Group Problem Solving	4-Feb
7-Feb	8-Feb R Book Lab 1	9-Feb	10-Feb Zoom: Group Problem Solving	11-Feb
14-Feb	15-Feb R Book Lab 2	16-Feb	17-Feb Zoom: Group Problem Solving	18-Feb
21-Feb	22-Feb R Book Lab 3	23-Feb	24-Feb Zoom: Group Problem Solving	25-Feb
28-Feb	1-Mar R Book Lab 4	2-Mar	3-Mar No Zoom Meeting	4-Mar
7-Mar <b>SPRING BREAK</b>	8-Mar <b>SPRING BREAK</b>	9-Mar <b>SPRING BREAK</b>	8-Mar <b>SPRING BREAK</b>	9-Mar <b>SPRING BREAK</b>
14-Mar	15-Mar R Book Lab 5	16-Mar	17-Mar Zoom: Group Problem Solving	18-Mar
21-Mar	22-Mar R Book Lab 6	23-Mar	24-Mar Zoom: Group Problem Solving	25-Mar
28-Mar	29-Mar R Book Lab 7	30-Mar	31-Mar Zoom: Group Problem Solving	1-Apr
4-Apr	5-Apr R Book Lab 8	6-Apr	7-Apr Zoom: Group Problem Solving	8-Apr
11-Apr	12-Apr Project Work	13-Apr	14-Apr <b>EASTER BREAK</b>	15-Apr <b>EASTER BREAK</b>
18-Apr <b>EASTER BREAK</b>	19-Apr Project Work	20-Apr	21-Apr Project Work	22-Apr
25-Apr	26-Apr Project Work	27-Apr	28-Apr Project Work	29-Apr
2-May	3-May <b>FINAL PROJECT 1:30-4:00 PM</b>	4-May	5-May	6-May