

## PLS 202 – Introduction to Data Analytics Summer 2020: Session 1

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### **COURSE DESCRIPTION AND OBJECTIVES**

Data analytics is a growing field that draws on many disciplines including Statistics, Computer Science, and Graphic Design. This course will provide an introduction to modern data analytics, with a focus on practical skills for social science research. The main goal of this course is to introduce R, a programming language designed specifically for statistics and data analysis. The course will cover basic programming concepts such as functions and data structures, as well as tools for data visualization, and a review of basic data analysis methods.

### **COURSE MATERIALS**

In order to complete this course, you will need a computer, internet access, and access to D2L. We will be using Desire2Learn (D2L) as our online course management software, which is found at: <https://d2l.msu.edu>. You will be able to access course lectures, readings, assignments, and your grades on D2L.

Problems? Any problems you encounter with D2L should be reported to MSU's Distance Learning Services, which is available 24 hours a day, 7 days a week. Their local number is 517-355-2345. Their toll-free number is 1-800-500-1554.

In addition to D2L, you need to install R (the language) and RStudio (a program for writing, testing, and publishing R code).

To download R, go to <https://cran.r-project.org/> and click the link for your operating system under the section titled "Download and Install R". Then follow the instructions to install the version appropriate for your specific system version.

To download RStudio, go to <https://www.rstudio.com/products/rstudio/download/#download> and click the link for your operating system. This will download an installer file. Once the installer is downloaded, double click it to run, and then follow the instructions to complete the installation.

### **COURSE REQUIREMENTS**

This course is organized into six modules. Each module includes video lectures, quizzes, and a homework assignment. The quizzes assess how well you have learned the course material, and

the homework assignments assess your ability to apply what you have learned to solve real-world data analytics problems.

*Quizzes (20 points each)* Each video lecture has a corresponding D2L quiz. Each quiz contains around 10 questions and related to the material for the corresponding lecture. You are allowed two attempts to take each quiz, and your highest score will be saved. You will be able to see the correct answers once the quiz is submitted.

*Homework (40 points each)* You will need to complete one homework assignment for each module. The homework assignments will be R script files that you will write yourself using the RStudio program, and submit in D2L. Your homework will be graded on the following criteria: Does the program run without errors? Does the program answer the question(s) given in the assignment? Does the program make correct use of the skills covered in the relevant course material?

## EVALUATION AND GRADING

*Point Values:* Each module is worth 100 points. Your total grade is calculated out of 600 points, with 360 points coming from quizzes, and 240 points coming from homework assignments.

Grading Scale:

Point Range	Grade
537 - 600	4.0
519 - 536	3.5
477 - 518	3.0
459 - 476	2.5
417 - 458	2.0
399 - 416	1.5
357 - 398	1.0
356 and below	0

## MODULE SUMMARY AND DUE DATES

Class starts on Monday, May 5 with the release of the first module. Each subsequent module will be made available on a weekly basis. All quizzes and homework assigned for each module must be submitted by the listed due date, no later than 11:59 PM East Lansing time (EDT).

**Module 1: First Steps in R** This module introduces the basic building blocks of the R language, and the RStudio programming environment. DUE DATE: *Thursday, May 21 at 11:59 PM*

**Module 2: Working with Data** This module introduces the concept of data structures, and shows how vectors and data frames can be used to sort, filter, arrange, split, and combine data sets. DUE DATE: *Thursday, May 28 at 11:59 PM*

**Module 3: Exploring Data** This module introduces descriptive data analysis. We will cover techniques for preparing data prior to analysis, and then begin exploring methods for identifying trends and patterns in data. DUE DATE: *Thursday, June 4 at 11:59 PM*

**Module 4: Data Visualization** This module introduces the concept of data visualization to communicate the results of a specific analysis. DUE DATE: *Thursday, June 11 at 11:59 PM*

**Module 5: Optimizing Data Analysis** This module introduces functions and lists, and shows how they can be used to manage larger data sets. DUE DATE: *Thursday, June 18 at 11:59 PM*

**Module 6: Branches and Loops** This module introduces strategies for solving more complex data analysis problems. DUE DATE: *Thursday, June 25 at 11:59 PM*

## **COURSE PRACTICES, POLICIES, AND DISCLAIMERS**

*Course Communication:* Course announcements will often be sent out via the email list provided by the registrar. It is your responsibility to make sure you can readily access any emails that are sent to your MSU email address. Announcements will also be posted in D2L when appropriate.

*Instructor Availability:* Questions may be communicated to Ezra and/or Caleb by email. Our email addresses are listed at the top of this syllabus. All emails will receive a response within 24 hours. Please also include “PLS 202” in the subject line so we will know to respond to your email within the appropriate amount of time.

*Late Work:* Work that is not handed in by 11:59 PM EDT of the due date is late. Late assignments will receive a 5% penalty if submitted less than an hour late, a 10% penalty if 1-4 hours late, a 20% penalty if 4-12 hours late, and 40% penalty if 12-24 hours late; you will receive no credit for anything submitted later than 24 hours past the due date.

*Grade Appeals:* People make mistakes. If you think there is an error in your recorded grade, then you should email Ezra. All concerns need to be emailed within one week of when the grade in question was posted, otherwise the posted grade cannot be revised.

*Learning Needs:* Any student who may need an accommodation because of any disability should contact MSU’s Resource Center for Persons with Disabilities (<http://rcpd.msu.edu/>) at 130 Bessey Hall within the first two weeks to provide me with information for proper accommodation. If you have any questions please feel free to contact them or ask me, all information and documentation will be kept confidential.

*Final Caveat:* This course hopefully will not deviate from what is written above, but the instructor reserves the right to modify anything within the syllabus as necessary to improve your learning experience. Any changes to the syllabus will be communicated via email and posted in D2L.