**Course Syllabus**

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**DBDA.X404 - Introduction to Data Analysis - 3.0 units**

**Instructor: Partha Padmanabhan**

**Course Description**

Data analysis is the process of transforming data into useful information to support decision making. It is the foundation for data mining, business intelligence, and predictive analytics. This course presents the tools, techniques and common practices used in the industry, including how to obtain, manipulate, explore, model, simulate and present data. It will help you build the essential technical skills to perform as data analyst or data scientist, and to continue other course studies in the certificate program.

The course examines different approaches to a data analysis project, with a framework for organizing an analytical effort. Popular tools for data analysis, such as R and Python can be used to carry out analysis, but R is used primarily in class instruction and examples. The course covers how to obtain and manipulate the raw data for use, as well as the basic exploratory analysis and common data analytical techniques such as regression, simulation, estimation and forecasting. It includes several graphing and visualization tools to understand the data and to present findings and results.

By the end of the course, you will learn a working framework to approach any data analysis project. You will be able to use R (or Python) to complete a large data analysis project, including a write-up with findings, insights and visuals. All tools used are open sourced.

**Prerequisite Skills**

Some programming experience is recommended. (R will be covered in class and used in examples, and Python experience can be helpful.) Basic knowledge of probability and statistics is required (at the level of most basic statistics textbooks; see [**for example  (Links to an external site.)**](http://www.stattrek.com/)).

**Notes**

None

**Learning Outcomes**

At the conclusion of the course, you should be able to:

* Describe  the framework to approach for the Data Analysis
* Discuss  the importance of Data Analysis for Data Science, Data Visualization & exploration
* Explain the basic concepts of R and using R for Data Analysis
* Identify the right tools, concepts and functions that are required for Data Analysis

**Course Outline**

Here’s an outline of what I plan to cover in class. But, it may be changed to meet your class’s needs.

|  |  |  |
| --- | --- | --- |
| **[Week/Module]** | **Topics** | **Assignments** |
| **1** | Introduction   * Introduction to Data Analysis |  |
| **2** | Using R   * Download & Install R * Concepts in R | Home assignment for the concepts learned in Week 2 |
| **3** | Continuation of Using R   * [Concepts in R]- continuation |  |
| **4** | Continuation of Using R   * [Concepts in R]- continuation |  |
| **5** | Data Analysis   * Prepping Data * Measuring Data Quality   + Univariate, Bivariate,Outliers... |  |
| **6** | Data Analysis   * Prepping Data * Measuring Data Quality   + Univariate, Bivariate,Outliers... |  |
| **7** | Data Visualization   * Data Visualization using R |  |
| **8** | Regression   * Using Various Types of Regression |  |
| **9** | Regression   * Using Various Types of Regression - Continuation |  |
| **10** | Final Project Demo |  |

**Required Tools and Materials**

* R Studio for Mac or Windows ( Open Source)

**Recommended Tools and Materials**

* None

**Performance Evaluation**

|  |  |  |
| --- | --- | --- |
| **Activity** | **Percentage** | **Description** |
| **Homework** | 30% | Includes home work assignments from the lessons learned in the class |
| **Class Participation** | 20% | Active participation in the class including the completion of class assignments |
| **Final Project Completion** | 50% | Completing the Final project and providing the demo in the class |
|  |  |  |
| **Total:** | **100%** |  |

**Grading**

Letter grades (A through F) are the default options.  However, students have until the day before the course end date to change their grading preference to a Credit/No Credit Option.

**Grading scale**

|  |  |
| --- | --- |
| **Grade options** | **%** |
| **A** | ≥ 93 |
| **A-** | 90-92 |
| **B+** | 88-89 |
| **B** | 83-87 |
| **B-** | 80-82 |
| **C+** | 78-79 |
| **C** | 73-77 |
| **C-** | 70-72 |
| **D+** | 68-69 |
| **D** | 63-67 |
| **D-** | 60-62 |
| **F** | 59 and below |
| **Credit** | 60 and above |
| **No Credit** | 59 and below |

**\*For alternative grading options, students MUST** **contact**[**extensiongrades@ucsc.edu**](mailto:extensiongrades@ucsc.edu)**with the Alternative Grade Form.**

**Click Here to Review the**[**Grading and Credits WebsiteLinks to an external site.**](https://www.ucsc-extension.edu/info/policies/grading-and-credits-policy/)

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