**ANLY 500 - Summer 2018**

**Section 91**

**Principles of Analytics I**

**Instructor: Anwar Husain**

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**Class time: Tuesdays, 8:00 to 9:30 pm**

**Office: TBD**

**Office Hours:** **Anytime with appointment**

**Course Description**

The material in this course covers an overview of Data Analytics, provides a foundation in research methodology, and introduces students to the R programming language. The goal of this course is to provide an understanding and foundation of the role of Analytics in today organizational environment. The course introduces recent approaches to managerial decision analysis and support. The student will be exposed to formal methods and specific computer‐based tools.

Data Analytics is a data‐driven process that provides insight. It may report on historical information or predictions about future events. The end goal of analytics is to add value through analyses that turn data into information. This course introduces a range of methods and modern technologies that are used in analytics today.

The instructional approach will include some software demos and illustrate applications of decision support technologies to problems in finance, marketing, manufacturing, services and health care management, and information systems consulting. Students have the opportunity to work on a personal project.

**Course Objectives**

The main goal of this course is to provide the students with an understanding of the data analytics process and to provide a foundation of skills to become a data analytics professional. Best practices for long-term success of analytics projects in terms of project management and communications are also covered. At the conclusion of this course, students will be able to:

* Demonstrate an understanding of the underlying methods and technologies used in business analytics;
* Analyze and applied alternate methods for designing, developing and implementing Business Analytics tools;
* Evaluate the selected alternative technology to use Business Analytics tools;
* Identify and justify opportunities for management support systems development and the specific considerations which apply in their effective management.

**Textbooks (Required)**

| **Book Title** | **ISBN-10** | **ISBN-13** |  |  |
| --- | --- | --- | --- | --- |
| **Business Analytics** | 0-321-99782-4 | 978-0-321-99782-1 |  |  |
| |  |  | | --- | --- | | **Author(s):** Evans | | | **Copyright:** 2016 | **Publisher:**Pearson | | | | |

Discovering Statistics Using R

ISBN-13: 978-1446200469

ISBN-10: 1446200469

Authors: Andy Field, Jeremy Miles, Zoe Field

Copyright: 2012

Publisher: SAGE Publications Ltd.

**Textbooks (Optional)**

Bhattacherjee, Anol, "Social Science Research: Principles, Methods, and Practices" (2012).Textbooks Collection.Book 3. <http://scholarcommons.usf.edu/oa_textbooks/3> This Book is brought to you for free and open access by the USF Tampa Library Open Access Collections at Scholar Commons.

**Software (Required)**

R and RStudio available at: <https://www.r-project.org/> and <https://www.rstudio.com/>

**Homework**

Homework assignments will not be graded but will considered as a bonus for final grade. Solution sets will be provided. You will be responsible for ensuring that you have completed any/all problems correctly. Problems on exams will be consistent with those recommended for you to complete weekly.

**Course Project**

Details about the course project will be discussed in class.

**Grading**

Mid-Term Exam 15%

Final Exam 15%

Course Project 15%

Laboratories 45% (22.5% each)

Participation 10%

**Course Conduct**

A few rules will help us to get the most of our investment in **ANLY 500**:

* Moodle is going to be our platform for almost all course activities.
* In addition, we will have at least one **live session** on weekly basis.
* **Attending live sessions** and actively participating in the discussions is included in your “Participation” grade. This is because live sessions are where the basic concept(s) of each unit are explained, assignments are discussed and your questions answered. Not participating will adversely affect your final grade.
* I anticipate that you will need 3 to 4 hours, to budget for **solving weekly assignments**.
* Because this course covers a very large amount of material very quick **NO graded assignments or exams will be accepted late**. Since accidents may always happen, after the deadline, everyone has one exception chance where you can submit your assignment (lab work) within a week after the deadline. You can use this one-time chance any time within the semester.
* **You are responsible for all the readings**, even if the material is not explicitly covered in class. You should read the class materials prior to class (or live session) and be prepared to discuss and ask questions about the readings and assignments.
* You should also **re-read the material** after class (or live session) as not every topic will be covered during class time. Many passages in the text may need to be read several times to gain clarity. Also, taking notes on the material you are reading and reflecting on the reading and these notes will help you better understand the issues, concepts and techniques that are being presented.
* Your work should be properly referenced and adhere to standards of both academic integrity and proper form. Generally, I prefer the APA style (see http://www.apa.org/).
* All class credit-related electronic mail must be done using Harrisburg's electronic mail service and the student's assigned Harrisburg University ID. By 'credit-related' I mean all work to be evaluated for credit. Any work submitted through a different mail system will **NOT** be accepted.
* All activities will be assigned individually unless mentioned in the assignment.
* Students who participate in University-sanctioned events (such as athletics) must make prior arrangements and give the instructor ample notice. Missing class (or a live session) for practice is not advised.

**Course Project Road Map**

**HU Core Competencies**

At the conclusion of this course a student will have met the following core competencies that reflect HU's mission:

* Critical Thinking and Problem Solving skills are demonstrated by the student’s ability to: Identify and clarify the problem**,** Gather information, Evaluate the evidence, Consider alternative solutions, Choose and implement the best alternative.
* Communication - The core communication skills are demonstrated by the student’s ability to: Express ideas and facts to others effectively in a variety of formats, particularly written, oral, and visual formats, Communicate effectively by making use of information resources and technology.
* Teamwork and Collaboration - The students will be working with others to increase involvement in learning and by sharing one's own ideas and responding to others' reactions to sharpen thinking and deepen understanding.
* Information Technology - The students will be making effective use of the .NET information resources and technology.

**Statement on Academic Integrity**

According to the University's Student Handbook: Academic integrity is the pursuit of scholarly activity free from fraud and deception, and is the educational objective of this institution. Academic dishonesty includes, but is not limited to cheating, plagiarism, fabrication of information or citations, facilitating acts of academic dishonesty by others, unauthorized possession of examinations, submitting work of another person, or work previously used without informing the instructor, or tampering with the academic work of other students. Any violation of academic integrity will be thoroughly investigated, and where warranted, punitive action will be taken. Students should be aware that standards for documentation and intellectual contribution may depend on the course content and method of teaching, and should consult the instructor for guidance in this area.

***Honor Code -*** We as members of Harrisburg University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work. As a Community of Learners, we honor and uphold the ***HU Honor Code***.

**Course Calendar**

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| **Week/Topic** | **Topics** | **Readings** | **Assignments** |
| 1 – Topic 1 | **Intro to Data Analytics / Foundations** | Evans: Chapter 1  Stop Hiring Data Scientists Until You’re Ready for Data Science by Greta Roberts, CEO, Talent Analytics Corp. Available at: <http://www.kdnuggets.com/2015/07/stop-hiring-data-scientists-until-ready.html>  Davenport, T. H., & Patil, D. J. (2012). Data Scientist: The Sexiest Job of the 21st Century.Harvard Business Review, (October), 70–77. Available at:  <https://hbr.org/2012/10/data-scientist-the-sexiest-job-of-the-21st-century/> | Topic 1  Install R and RStudio (the free versions)  Case: Performance Lawn Equipment page 34 – **Lab 1 Part One**  Due: Install Rstudio & R |
| 2 – Topic 2 | **Descriptive Analytics / Exploring Data** | Evans: Chapter 3  Davenport, T. (2015). 5 Essential Principles for Understanding Analytics. Harvard Business Review, (October 21), Available at:  <https://hbr.org/2015/10/5-essential-principles-for-understanding-analytics?cm_sp=Article-_-Links-_-Top%20of%20Page%20Recirculation> | Topic 2 – Online Session 1  Case: Performance Lawn Equipment page 94 (Note: you may want to go back to Chapter 2 and do the Case: Performance Lawn Equipment on page 52 to prepare for the Chapter 3 case.)  Due: N/A |
| 3 – Topic 3 | **Some Statistics and Probability** | Evans: Chapter 4 | Total 3 – Online Session 2  Case: Performance Lawn Equipment page 129  Due: N/A |
| 4 – Topic 4 | **More Statistics and Probability** | Evans: Chapter 5 | Total 4 – Online Session 3  Case: Performance Lawn Equipment page 179  Due: N/A |
| 5 – Topic 5 | **Sampling and Estimation** | Evans: Chapter 6 | Total 5 - Online Session 4  Case: Performance Lawn Equipment page 203  Due: N/A |
| 6 – Topic 6 | **More Statistics** | Evans: Chapter 7 | Topic 6 – Online Session 5  Case: Performance Lawn Equipment page 231  Due: N/A |
| 7 – Topic 7 | **Predictive Analytics / Trends** | Evans: Chapter 8 | Topic 7 – Online Session 6  Case: Performance Lawn Equipment page 272  Due:   * Lab 1 * Final Project Proposal |
| 8 – Topic 8 | **Forecasting** | Evans: Chapter 9 | Topic 8 – Online Session 7  **Mid-Term Review**  Case: Performance Lawn Equipment page 300  Due: Midterm Exam |
| 9 – Topic 9 | **Predictive Analytics / Regression in-depth** | Additional Handout(s) on Regression | Topic 9 – Online Session 8  Due: Midterm Exam |
| 10 – Topic 10 | **Data Mining** | Evans: Chapter 10 | Topic 11 – Online Session 9  Case: Performance Lawn Equipment page 340  Due: Data Mining Forum - Discussion |
| 11 – Topic 11 | **Project Proposals** | Project Status Presentation | Topic 12 – Online Session 10  Due: N/A |
| 12 – Topic 11 | **Risk** | Evans: Chapter 12 | Topic 13 – Online Session 11  Case: Performance Lawn Equipment page 414  (Note: you may want to complete Performance Lawn Equipment page 376 too.) |
| 13 – Topic 12 | **Prescriptive Analytics / Optimization** | Evans: Chapters 13 | Topic 14 – Online Session 12  Case: Performance Lawn Equipment page 455 |
| 14 – Topic 14 |  | Project Presentation | Due:   * Final Exam * Lab 2 * Final Project |
| 15 |  | **Classes officially end** |  |