## Winter 2018 – BUS 460 Topics in Management: Data Analytics Bootcamp

## *In addition to this syllabus, please read “Salé’s Guide to Life” posted on eLearn Enrollment in this course serves as an agreement to the policies in this syllabus and “Salé’s Guide to Life.”*

**Faculty Information:**

Course Instructor: Dr. Michael J. Salé

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Office: Stanger Hall 106

Office Hours: After class

Email: [msale@stonehill.edu](mailto:msale@stonehill.edu)

Course Meeting Time: Monday, January 8 – Friday, January 12 – 9:00am – 4:30pm  
Course Meeting Place: Duffy Academic Center 115

**Business Administration Department Mission Statement:**

The Stonehill College Department of Business Administration offers a high quality business education that emphasizes strong communication skills, a high degree of business literacy and a global perspective to prepare students to make ethical, thoughtful and significant contributions to their organizations and communities as professionals.  In the spirit of the Congregation of Holy Cross, with a foundation in the liberal arts, and using a high degree of student-faculty interaction, we provide a multidisciplinary curriculum delivered with an emphasis on the student.  We value the enrichment of the learning environment through intellectual contributions of faculty in the areas of teaching and learning, discipline-based research, as well as contributions to practice.  Faculty also pursue knowledge creation through collaboration with other disciplines.

The delivery of our business education program is guided by the following learning goals:

*lg1 Business Literacy*

*lg2 Ethical Perspective*

*lg3 Effective Oral Communication*

*lg4 Global Awareness*

**Course Description/Objectives:**

Businesses are starved for students who have skills in data and business analytics.  Statistics gathered by major consulting firms state that over 65% of businesses are not able to hire students with adequate analytics skills.  This Wintersession bootcamp course will provide students with an initial foundation in business analytics skills.

Students will be required to complete preparatory reading and work before the bootcamp.  During the Bootcamp, student will learn topics such as:

Day 1: Basics of data analytics and analysis software

Day 2: Data gathering and preparation

Day 3: Query development and SQL

Day 4: Data mining techniques and basics of R

Day 5: Visualization and data storytelling

After the week-long bootcamp, students will complete a project of their own using either data assigned to them by the professor or data they find themselves.

**Course Deliverables:  
*You will be responsible for…***

**\*\*\*\*\* Late Assignment Policy \*\*\*\*\***

* **All assignments are due by the date and time listed in the Course Schedule.** All work is submitted online via GitHub unless stated otherwise in the schedule or in class.
* **No late work will be accepted for any reason unless I am mandated to make an exception by the college. Otherwise there are no exceptions to this policy. Please do not ask. One lab exercise will be dropped.**
* Assignments should never be emailed to me. If you email an assignment, it will not be acknowledged or graded.
* If you are having technical difficulty while submitting an assignment, please email me as soon as possible before the deadline so I can assist.
* keeping up with the **text and other readings** as indicated in the course schedule. There will be readings during the preparatory week (Jan 2 – 5) and during the course week (Jan 8 – 12). It is important to understand that reading before class isn’t just something you should do. Your success in the course will depend upon it. It will be virtually impossible to complete homework, case studies, or understand the lectures without reading first;
* completing in class and out of class **lab exercises**;
* completing several **exercises** in the *Doing Data Science* textbook;
* completing several **DataCamp** online lessons;
* completing a data analysis **project**.

**Prerequisites:**

* N/A

**Attendance, Tardiness, Class Contribution, and Class Preparation**

Ten percent (10%) of your course grade is based on class contribution and preparedness. Credit for this portion of your grade is not automatic – it must be earned. You are expected to attend all classes on time and stay for the entire duration. Being late to class is disrespectful to your classmates and your professors. Continued tardiness will result in a reduction in your contribution grade.

Class contribution comes in many forms. Some examples are thoughtfully answering questions in class, asking informed questions, and productively participating in class discussion. You should be prepared for every class. This means that you have done the requisite reading and have prepared notes and questions ahead of time. I use the Socratic method in class. This means I will call on everyone, not just those who raise their hand.

The Class Contribution & Preparedness portion of grade will be evaluated according to the following guidelines:

* 10 points: always well prepared for class; volunteers regularly and responds confidently when questioned; facilitates productive peer discussions; offers reasoned responses of high quality and asks thoughtful questions on an ongoing basis.
* 8-9 points: contributes regularly; volunteers frequently; generally prepared; questions and responses of moderate quality; handles direct questions satisfactorily.
* 6-7 points: allows others to carry the ball; volunteers infrequently; participates infrequently; needs to be prodded; weak preparation to speak; or wastes class time with questions of little substance.
* 5-6 points: inadequate preparation or participation; generally does not volunteer; little involvement; doesn’t make an impression, missed three classes (unexcused).
* < 5 points: seldom participates, has to be prodded, unprepared to speak, has difficulty answering questions, or disruptive in class (e.g. unauthorized or inappropriate use of computers, tablets, or cell phones during class, having personal conversations during a lecture), walking out during class before it has been dismissed.

**Grade Determination:**

|  |  |
| --- | --- |
| Category | ***Weight*** |
| Class Contribution & Preparedness (evaluated using criteria on previous pg.) | 10% |
| DataCamp Lessons | 20% |
| In and Out of Class Labs | 20% |
| DDS Exercises | 15% |
| Project | 35% |
| **Total:** | **100%** |

Credit will be determined by assigning a numerical value to each category, corresponding to 100%. Final grades will be calculated by multiplying the relative weights by the achievement earned for each category. A letter grade will be assigned, using the following table:

|  |  |  |  |
| --- | --- | --- | --- |
| **Achievement** | **Letter Grade** | **Definition** | **Quality Points per Credit Hour** |
| 93-100 | A | Excellent, work that is of the highest standard, showing distinction | 4.00 |
| 90-92 | A- | 3.70 |
| 87-89 | B+ | Good, work that is of high quality | 3.30 |
| 83-86 | B | 3.00 |
| 80-82 | B- | Satisfactory, work that fulfills requirements in quality and quantity and meets acceptable standard for graduation | 2.70 |
| 77-79 | C+ | 2.30 |
| 73-76 | C | 2.00 |
| 70-72 | C- | Passing, work that falls below graduation standard, yet is deserving of credit | 1.70 |
| 67-69 | D+ | 1.30 |
| 60-66 | D | 1.00 |
| <60 | F | Failure, work undeserving of credit | 0.00 |

**Honor Code & Academic Integrity:**

In the context of community of scholarship and faith, and anchored in the belief in the inherent dignity of each person, the students, faculty, staff and administration of Stonehill College maintain an uncompromising commitment to academic integrity. We promote a climate of intellectual and ethical integrity and vigorously uphold the fundamental values of honesty, trust, fairness, and responsibility while fostering an atmosphere of mutual respect within and beyond the classroom. Any violation of these basic values threatens the integrity of the educational process, the development of ideas, and the unrestricted exchange of knowledge. Therefore, we will not participate in or tolerate academic dishonesty.

Violations of the academic integrity policy include but are not limited to the following actions:

* Presenting another’s work as if it were one’s own;
* Failing to acknowledge or document a source even if the action is unintended (i.e., plagiarism);
* Giving or receiving, or attempting to give or receive, unauthorized assistance or information in an assignment or examination;
* Using cheating websites disguised as “homework or study help” sites. Downloading from or uploading to these sites is a violation of this policy;
* Fabricating data;
* Submitting the same assignment in two or more courses without prior permission of the respective instructors;
* Having another person write a paper or sit for an examination;
* Unauthorized use of electronic devices to complete work;
* Furnishing false information, including fabricating excuses for incomplete work or lying about violating this policy; or
* Not reporting someone who you know has violated this policy.

**I take academic honor and honesty very seriously. If you are unsure as to whether your actions in this course are in accordance with the Stonehill College Honor Code, please ask me before carrying out these actions. Violation of these policies may result in sanctions up to and including failure of the course or expulsion.**

If you are found in violation of the Honor Code/Academic Integrity Policy (intentionally or unintentionally), you will be emailed with a description of the alleged violation. You must schedule a meeting with me to discuss the issue and decide on a resolution. If you are found to be “not responsible,” no further action will be required. If you are found to be “responsible,” I will determine an appropriate sanction. Sanctions may include, but are not limited to: receiving a zero grade for the assignment, a reduction in your final course grade, or failure of the course. If we in agreement about the violation and sanctions, the incident will be recorded in your student record as an “Informal Letter” or a “Formal Letter.”

Informal Letter: An informal/formative letter is a discipline record that is destroyed after graduation. The letter is kept confidential and is shared only in the case of a repeated violation of the Academic Integrity Policy or upon request of the student (often as part of the admission process to graduate and professional schools, service programs, etc.).

Formal Letter: A formal letter is a discipline record that is retained for seven years post-graduation. The letter is kept confidential and is disclosed only under the following circumstances:

* With the relevant members of the Academic Integrity or Academic Appeals Board in the case of a repeated violation of the Academic Integrity Policy;
* Upon request of the student (often as part of the application and/or admission process to graduate and professional schools, service programs, etc.); or
* When disclosure is appropriate or necessary under FERPA (e.g., upon request from law enforcement, in conjunction with the issuance of a valid subpoena, etc.)

If we cannot come to an agreement, the incident will be referred to the college’s Academic Integrity Board.

For further information on this policy, the procedure for adjudicating incidents, and your rights as a student, see: <http://catalog.stonehill.edu/content.php?catoid=9&navoid=405&returnto=search#stonehill_college_academic_honor_code_policy_procedures>

**Accommodations:**

Stonehill College is committed to providing a welcoming, supportive and inclusive environment for students with disabilities. The Office of Accessibility Resources (OAR) provides a point of coordination, resources and support for students with disabilities and the campus community. If you anticipate or experience physical or academic barriers based on disability, please let me know so that we can discuss options. You are also welcome to contact OAR to begin this conversation or to establish reasonable accommodations for this or other courses. OAR is located within the Academic Services & Advising Suite in Duffy 104. For additional information please call (508) 565-1306 or email [accessibility-resources@stonehill.edu](mailto:accessibility-resources@stonehill.edu).

**Course Guidelines:**

***Assigned Readings & Exercises***

* Please complete all assigned readings **before** the class in which they will be discussed. Class preparedness is essential to good class discussion. It is disappointing to everyone (and it makes the class boring) if you are not prepared. Most readings will be from the DDS textbook. Additional readings will be posted on GitHub.
* After thoroughly reading the assigned chapters, you may also be asked to complete exercises at the end of the chapter (see Course Schedule). You should prepare these answers and bring them to class printed out. Do your best when preparing these answers. While I do not expect that you will be able to complete all of them perfectly, they are a very good way to test your comprehension of the reading. Exercises answers should be submitted to GitHub by 9am on the day we will discuss them.

***Lab Exercises***

* There will be 7-8 lab exercises for you to complete by the end of the course. These exercises must be completed alone unless otherwise specified.
* All lab exercises must be submitted on GitHub by the deadlines in the course schedule.

***DataCamp Lessons***

* Each student will individually complete multiple online DataCamp chapters in order to learn R programming. We will review some of the concepts, but much of the R programming skills you learn will be done on your own time due to time constraints.
* Proof of completing of these chapters (screenshots or certificate) must be submitted to GitHub by Jan 19.

***Project***

* Each student will complete a short project using a series of provided data sets. This project will be done during the third week of class (Jan 15 – 19) and should be submitted on GitHub.
* More details regarding requirements for the project will be provided in class.

**Student Resources:**

***Required Resources – You must bring your laptop, textbooks, and calculator to EVERY CLASS!***

*Textbooks:*

* *Doing Data Science: Straight Talk from the Frontline*O’Neil, Schutt  
  Publisher: O’Reilly (2013), ISBN-13: 978-1449358655

***BOTH of these textbook will be provided to you for free in eBook format!***

* *Data Science for Business*Provost, FawcettPublisher: O’Reilly (2013), ISBN-13: 978-1449361327

*Software & Online Resources:*

* JMP 13 Statistical Software

For this course, we will be using a trial version of JMP 13. Please download and install JMP 13 to your personal laptop. The software can be found at this address: <https://www.jmp.com/en_us/software/download-jmp-free-trial.html>

Please install JMP even if you have a previous version on your laptop.

* Microsoft Office 2016

Please **do not** use Google Docs, Apple Pages, or any other office suite. If you do not have the latest Microsoft Office installed, please see the instructions located at: <http://www.stonehill.edu/offices-services/it/support/knowledge-base/>. If you have any problems downloading or installing Microsoft Office, please visit the IT Service Desk on the bottom floor of Duffy Academic Center.

* Slack

We will use an app/tool called Slack to communicate during this course. Unless a matter is personal or confidential, please use slack instead of email so the whole class can see the conversation. Open communication is essential on a team. If you have not already joined the Slack channel, please download the Slack app on your phone and use this link to join: <https://goo.gl/2EtpQo>

* GitHub

Please create a GitHub account at <https://github.com/> and notify me in Slack of your GitHub user name so I can add you as a collaborator to our course repository. On GitHub you will find all of the resources for the course (textbooks, other readings, assignments, etc.). You will also submit all of your assignments via GitHub. We are using GitHub because it is the industry standard way to control source code (so, you are learning a skill), and because eLearn is down during part of the course.  
Please also download and install GitHub Desktop on your laptop: <https://desktop.github.com/>

* DataCamp

We will use the DataCamp online learning platform to learn R programming. Please join our course by using this link: <https://goo.gl/dyrm35>

* Microsoft Power BI

We will use Microsoft Power BI to create data visualizations and reports. This software will be available on the computers in our lab. However, if you want to install it on your laptop, it only works on Microsoft Windows. You can find it here: <https://powerbi.microsoft.com/en-us/desktop/>

**Course Schedule:** This schedule may be adjusted during the course. I will always post the latest version in GitHub.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Day** | **Date** | **Topics** | **Reading** | **Due Prior to Class *All assignments due before 9am on due date*** |
| ***Prep*** | 1/2-1/5 | - Get all accounts and software setup  (see syllabus *Student Resources* section for more information)  - Basics of data science and data science problem solving process | - DDS Ch. 1 & 2  - DSB Ch. 1 & 2 |  |
| ***1*** | 1/8 | - Basics of data analytics - Experimental design  - Sampling (n = ALL v. 1)  - Analytics cycle  - Problems v. Symptoms  - Software (R, Python, Excel, JMP, SAS, SPSS, Tableau, Power BI, etc.)  - Data science teams / team roles  - Agile concepts |  |  |
| ***2*** | 1/9 | - Data basics  - How much data do we produce?  - Types of data  - Sources of data  - Messy data is reality  - Preparing data for analysis (workshop) |  |  |
| ***3*** | 1/10 | - Introduction to relational databases  - Oracle v. MySQL v. SQL Server v. NOSQL databases  - Understanding normalization  - Designing queries  - SQL (workshop) |  |  |
| ***4*** | 1/11 | - Data mining techniques  - Classification, clustering, regression (simple and multiple), decision trees, neural networks, text analysis, sentiment analysis, and others.  - Workshop on regression, clustering, classification, and neural networks  - Explore IBM Watson Analytics (if time) |  |  |
| ***5*** | 1/12 | - The need for reporting  - Report types and designs  - Keys to making a great report  - Dashboards  - Microsoft Power BI (workshop) |  |  |
| ***Post*** | 1/15-1/19 | - Project (more info soon) |  |  |

DDS = Doing Data Science textbook DSB = Data Science for Business textbook