Rowan College at Burlington County

Science, Technology, Engineering, and Mathematics Division

Course Title: Introduction to Data Science | **Course Code**: CSE 115 - XXX

Pre-requisites: None | **Credits**: 3

Contact hours: 3/0/0

Class Time: TBD | **Location:** TBD

Instructor: Chris Simber | **email:** csimber@rcbc.edu | **Phone:** x 2090

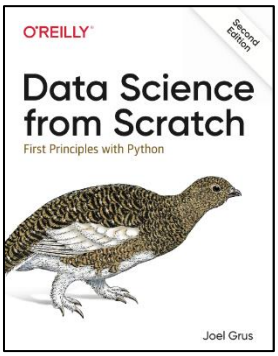
Office: TEC – 211G | **Office hours**: M/W 11:00 – 12:00, T/TH 3:00 – 4:00
Others by appointment

SECTION 1:

Course Description: This course introduces foundational topics in data science including data manipulation, data analysis with statistics, machine learning, data communication and information visualization. It is intended to introduce the tools and techniques necessary to solve problems involving data. As an introductory course, and will demonstrate and explain programming and statistical data analyses without requiring prerequisite coursework in these areas. It is designed for the student interested in exploring the data science field, or as a first course in a degree program in data analytics or data science.

Required Material: some of the course assignments require access to a computer running Python and the capability to save files.

Web-enhanced: This course will utilize Blackboard as a repository for course material.



Required Text: **Data Science from Scratch: First Principles with Python**, 2nd Edition**,** Joel Grus, O'Reilly, ISBN: 978 1 492 04113 9

Supporting Text: **Introduction to Python**, 2nd Edition**,** Chris Simber, Instructor provided OER Text

General Education Outcomes:

- Written and Oral Communication: Communication
  - Students will logically and persuasively support their points of view or findings
- Technology Competency or Information Literacy: Technology
  - Students will demonstrate the skills required to find, evaluate, and apply information to solve a problem.

Course Learning Outcomes: Upon completion of this course, students will be able to:

- Employ foundational topics and concepts in data science
- Interpret and discuss data analysis charts and graphs developed using the Python programming language and libraries, and data sets.
- Employ data science terms and concepts as they apply to analyzing and reducing data
- Discuss basic data science theory and fundamental analysis techniques for data reduction

Core Course Content:

- Python for Data Science
- Data Munging and Cleaning
- Data Modeling and Visualization
- Statistical Analysis, Linear Algebra
- Linear and Logistic Regression
- Bayesian Classification
- Deep Learning
- Big data Platforms and technology
- Map Reduce, TensorFlow
- Human Factors and Ethical Practices in Data Science

SECTION 2:

Course and Classroom Policies:

Expectations: Students are expected to attend class lectures, and review RCBC email and the Blackboard course shell daily, read the assigned text chapter, complete and submit assignments by the due date, and participate in Forums. Students are expected to conduct themselves in a professional manner during live sessions and in Discussion Forums.

Class Attendance when a course is not meeting face-to-face is determined as logging into Blackboard and RCBC email on a daily basis to review announcements and course material.

Required email: Students are assigned an email account by the college (*firstname_lastname@mymail.rcbc.edu*). Students are expected to use this account to correspond with the instructor, submit assignments, and to include the course code in the subject line.

Criteria for Grade Determination:

Grading: Grades will be based on assignments and three (3) exams as noted below. Makeup tests require a valid excuse and can result in loss of grade points. Class participation and attendance will be considered in the final grade.

Assessment Methods:

Assignments	55%
Exam 1	15%
Exam 2	15%
Exam 3	15%
Total	100%

Letter Grades

A = 90 - 100
B+ = 85 - 89
B = 80 - 84
C+ = 75 - 79
C = 70 – 74
D = 60 - 69
F = Below 60

Assignments: Assignments constitute 55% of the grade for this course, and some will be computer generated and will be emailed to the instructor as **text file (*.txt) attachments** using RCBC email accounts. The email title shall include the course code, and the assignment number. The filename will include first initial and last name of the student.

Grading: Grades are based on assignments, and three (3) exams. Late assignments will incur a **grade penalty of three (3) points per day** after the first day, and will **not** be accepted if submitted **more than one (1) week late**. Makeup tests require a valid excuse and can result in loss of grade points.

Course Outline/Schedule*:

Week	Application/Chapter	Assignments
1	Introduction, Data Science (Chapter 1)	
	Python, Programming in Python (Chapter 2)	
2	Programming in Python	Chapter 2
	Visualizing Data, Charts (Chapter 3)	Chapter 3
3	Linear Algebra, Vectors, Matrices (Chapter 4)	Chapter 4
	Statistics, Correlation, Causation (Chapter 5)	Chapter 5
	Probability, Theorems, Distributions (Chapter 6)	Chapter 6
4	Hypothesis and Inference, Bayesian Inference (Chapter 7)	Chapter 7
	Gradient Descent (Chapter 8)	Chapter 8
5	Material Review	Exam #1
6	Getting Data, Files, Delimiters, Scraping (Chapter 9)	Chapter 9
7	Cleaning and Munging, Reduction (Chapter 10)	Chapter 10
8	Machine Learning, Over/Under-fitting (Chapter 11)	Chapter 11
	K-Nearest, Dimensionality (Chapter 12)	Chapter 12
	Bayesian Model (Chapter 13)	Chapter 13
9	linear and Multiple Regression (Chapters 14 &d 15)	Chapter 14 & 15
	Logistic Regression, Decision Trees (Chapters 16 & 17)	Chapter 16 & 17
10	Material Review	Exam #2
11	Neural Networks, Deep Learning (Chapters 18 & 19)	Chapter 18 & 19
	Clustering (Chapter 20)	Chapter 20
12	Natural language Processing, Gibbs Sampling (Chapter 21)	Chapter 21
13	Network Analysis, Recommenders (Chapters 22 & 23)	Chapters 22 & 23
14	Databases and SQL (Chapter 24)	Chapter 24
	MapReduce (Chapter 25)	Chapter 25
15	Data Ethics, Summary (Chapters 26 & 27)	Chapters 26 & 27
		Exam #3

* Course Outline is subject to change

SECTION 3:

College Policies: In order for students to know their rights and responsibilities, all students are expected to review and adhere to all regulations and policies as listed in the College Catalog and Handbook. The current college catalog and student handbook are important documents for understanding your rights and responsibilities as a student in the RCBC classroom. Please read your catalog and handbook as they supplement this syllabus, and can be accessed at

rcbc.edu/publications. Important policies and regulations include, but are not limited, to the following:

- College Attendance Policy
- Grading Standards
  - Withdraw (W) and Incomplete Grades (I)
  - Withdrawal date for this semester – Academic Calendar
- Student Code of Conduct
  - Academic Dishonesty/Plagiarism and Civility
- Use of Communication and Information Technology

Weather Closure: In the event that the College is closed due to weather, students should access the course Blackboard shell for announcements and course material.

- **Academic Integrity Code**
- ***Plagiarism*** – Plagiarism includes copying or paraphrasing another's words, ideas, or facts without crediting the source; submitting a paper written by someone else, either in whole or in part, as one's own work; or submitting work previously submitted for another course or instructor. Plagiarism on any assignment will result in failure for that assignment and may result in further disciplinary action, including but not limited to failure for the course. Refer to the Student Handbook for additional information regarding plagiarism and College regulations.
- ***Texting, Cell phones, and Laptops*** – should be turned off in class or the ringer must be turned to silent. No texting is allowed in class during instruction time.
- ***Internet and Other Computer Use*** – all students are required to abide by established RCBC computer and Internet use procedures and regulations. Willful damage to or misuse of RCBC computers and/or software will be considered a violation of the RCBC Student Code of Conduct. Criminal prosecution may also result. This applies to IPODS, games or electronics of any kind, instant messenger, and social media.

Student Conduct Code - We shall abide by the expectations outlined in the Student Handbook (page 106-112). RCBC students are accountable according to the standards established in this policy. **http://www.rcbc.edu/conduct**

Tutoring - RCBC offers free tutoring for all currently enrolled students. For more information regarding the Tutoring Center, please call extension 1495 at (609) 894-9311 or visit the Tutoring Center website at: **http://www.rcbc.edu/tutoring**

Academic Advisement – RCBC provides Academic advising and free referral services to all students through the office of Academic Advising. Call extension 7337 at (856) 222-9311 or visit the website at: **http://www.rcbc.edu/advising**

Library Resources – The RCBC Library provides access to the information resources you need to succeed in your studies, including books, journals and databases. Library Information Specialists

provide support in finding and utilizing these resources. Library services are available at the Mount Laurel Student Success Center and online at http://www.rcbc.edu/library. Online services include IM Chat, text, and phone support during regular hours and access to a wide variety of journals and databases 24/7/365 from both on and off campus. Library hours are posted in the libraries and on the library website.

Office of Student Support and Disability Services: RCBC welcomes students with disabilities into the college's educational programs. Access to accommodations and support services for students with learning and other disabilities is facilitated by staff in the Office of Student Support (OSS). To receive accommodations, a student must contact the OSS, self-identify as having a disability, provide appropriate documentation, and participate in an intake appointment. If the documentation supports the request for reasonable accommodations, the OSS will provide the student with an Accommodation Plan to give to instructors. For additional information, please contact the Office of Student Support at 609-894-9311, ext. 1208, disabilityservices@rcbc.edu, or http://www.rcbc.edu/studentsupport.

Educational Technology Statement: Rowan College at Burlington County (RCBC) advocates the use of technology to enhance instruction. Students should assume that classroom and online technology will be used throughout their coursework at RCBC, as it will most certainly be used in their future education and careers. The College provides on-campus facilities for the convenience of the RCBC community. Various college departments, including the Office of Information Technology and the Office of Distance Education, provide technology training and assistance to faculty and students.

Student Success Services: RCBC offers a variety of free services for its students including those listed below. Descriptions of these services, as well as many others, can be found in the College Catalog and Handbook and on the RCBC website at rcbc.edu/publications.

- Academic Advisement (rcbc.edu/advising)
- Career Services (rcbc.edu/careers)
- Educational Opportunity Fund (EOF) (rcbc.edu/eof)
- Financial Aid (rcbc.edu/financialaid)
- International Students Office (rcbc.edu/international)
- Library/Integrated Learning Resource Center (ILRC) (rcbc.edu/library)
- Office of Veteran Services (rcbc.edu/vets)
- Student Support Counseling (rcbc.edu/cpit)
- Tutoring Center (rcbc.edu/tutoring)
- Test Center (rcbc.edu/testcenter)
- Transfer Services (rcbc.edu/transfer)
- Test Center (rcbc.edu/testcenter)

This syllabus is subject to change at the instructor's discretion.