

INFO 4120-1: Python Programming

<u>Term and Credits:</u> Fall 2018 4 Credit Hours CRN: 3239	<u>Time and Location:</u> Tu/Th 2:00-3:50pm in DCB 120 You will be required to review some material outside of class which will be delivered through Canvas. Make sure you have a good internet connection during class for access to Canvas and Top Hat.
<u>Instructor:</u> Name: Kellie Keeling Department: Business Information & Analytics Office Location: DCB 590 Office Hours: Tu/Th 10:00am-11:00am Tu/Th 1:00pm-1:50pm GTA Office Hours: Coming Later Email: kkeeling@du.edu Office Phone: 303-871-2296 (forwards to my cell)	<u>Communication Conduct:</u> Feel free to refer to me as Dr. Keeling, Professor, or Kellie as you feel comfortable. Email is usually the best way to contact me. If I haven't responded in 36 hours, feel free to resend your message. I will send class level communications via Canvas announcements. I will typically initiate communication with individual students directly through your DU email or through Canvas email. My open office hours times are available on the home page in Canvas under "My Office Hours." To specifically make an appointment with me, click that link which goes to http://doodle.com/kkeeling which will allow you to request an appointment time. If there is an open time, you can also just stop by.

COURSE DESCRIPTION:

Python is a popular general purpose programming language which is well suited to a wide range of problems. With the right set of add-ons, it is comparable to domain-specific languages such as R and MATLAB. Python is a scripting language. The following topics will be covered: Importing data, Reading and writing files, Cleaning and Managing Data, Merging and joining DataFrame objects, Plotting and Visualization, Statistical Analysis, and Linear models. Packages: Pandas, NumPy, matplotlib, stats/statsmodels, and iPython. Principal Content Elements: 1. Introduction to Programming Logic and Design Using Python 2. Data Management 3. Statistical Analysis 4. Advanced Data Management and Statistical Analysis

PREREQUISITES/CO-REQUISITES:

Co-requisite: INFO 4610

COURSE TOPICS:

- Introduction to Programming Logic and Design Using Python (PROG)
 - Variables, Data Types
 - Arithmetic Operators and Comparisons (<, >, =, TRUE/FALSE)
 - Displaying Output & User Input
 - Comments
 - Pseudocode
 - Simple Statements, Program Control Statements
 - Lists, Slicing, Dictionaries
 - Functions and Variable Scope
- Data Management (DM)
 - Numpy and Pandas
 - Reading Data and Writing Text and Excel Files
 - Handling Missing Data
 - Cleaning, Merging, Recoding, and Reshaping Data and using SQL
- Statistical Analysis (STAT)
 - Basic Summaries
 - Graphing
 - Aggregating/Grouping/Cross Tabs
- Advanced Data Management (ADVDM) (tentative topics)
 - Working with other filetypes (.tsv, .xlsx, .xml, .json)
 - Using Python without an IDE
 - Web Scrapping
 - Using a GUI
- Advanced Statistical Analysis (ADVSTAT) (tentative topics)
 - Statistical Testing (comparing means, regression)

LEARNING OUTCOMES:

By the end of this course, students will be able to

1. Understand and use the basic components of coding (sequential, conditional, and looping structures)
2. Be able to perform basic and advanced data management tasks using Python including reading and writing data, cleaning, and reshaping datasets.
3. Be able to perform basic exploratory and statistical analyses with Python

REQUIRED MATERIALS:

- Software
 - **Anaconda for Python 3.6** for Windows or Mac. See Canvas page: Python Resources for Installation Instructions.
- Top Hat – Polling Software (\$28) – look for email inviting you to course

GRADING STRUCTURE, SCALE, AND POLICIES:

GRADING STRUCTURE:

Performance will be evaluated on the items below. For this class, all assignments assume you are trainees for Stats Dairy. Your training score is only a measure of your performance in this class and does not reflect my opinion of you as an individual or your worth as a person.

4 Homeworks (1 for each Module except final Module)	30%
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5 Quizzes (1 for each Module)	28%
2 Projects	28%
Informal In Class Assessments (Mini Assign/Top Hat)	14%

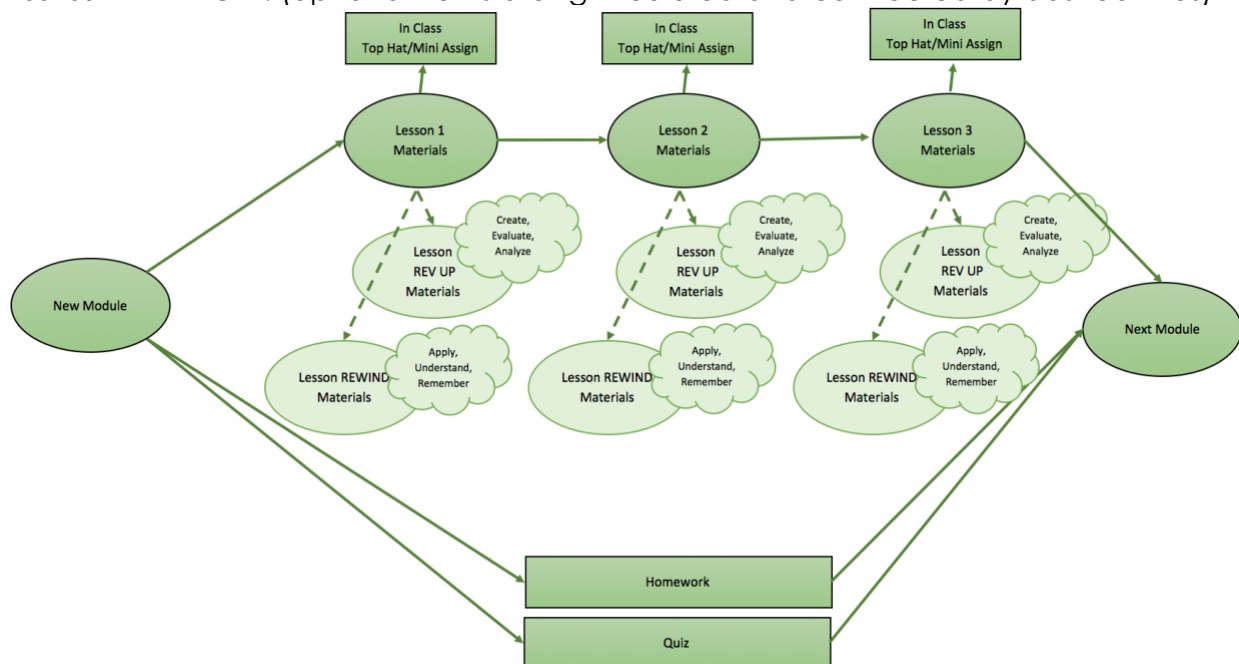
GRADING SCALE:

Stats Dairy regularly hires more trainees than it needs. By means of this course we determine where to place the graduates of the program:

- 90% - 100% A Trainees who receive an A are considered on the "fast track" and will start out as data mining analysts. Our studies show that most trainees who fall in this group reach an executive position within 10 years.
- 80% - 89% B Trainees who receive a B will start out as assistant data mining analysts. This does not mean that they cannot reach the executive level but it will be more difficult since they will not regularly be put into career-enhancing positions such as overseas consulting assignments.
- 70% - 79% C Trainees who receive a C will be put into staff positions for further development.
- 60% - 69% D Trainees who receive a D will be offered non-management positions.
- 00% - 59% F Trainees who receive an F will be separated from Stats Dairy.

A: 93-100%; A-: 90-92.9%; B+: 87-89.9%, B: 83-86.9%; B-: 80-82.9%; etc.

ASSESSMENT FLOW: (optional Items are light-colored and connected by dashed lines)



ASSESSMENTS: - You may talk with others and get advice about the approaches to solve the problems, but **DO NOT SHARE COMPUTER FILES** – this work should be completed on your own. If I feel you turn in work that is not your own, I will turn you

in to DU Honor Code.

- **Homework** – each module will have an individual homework assignment that will cover material from all Lessons in the module. You should be able to start the homework before completing the final lesson, but some parts will come from the last lesson. I will try to note which Lessons the material comes from so you can work as we move through the module.
 - Late Work Accepted with 7 points penalty per day
- **Quizzes** – each module will have an online quiz that you need to take before the next module begins. You will have 2 attempts to complete the quiz.
 - No Late Assignments Accepted
- **Projects** – there will be two individual projects and instructions will be delivered through Canvas later in the quarter.
 - Late Work Accepted with 10 points penalty per day
- **Informal In-Class Assessments** – these are items that are COMPLETED DURING CLASS. The Mini Assignment Progress and Top Hat together will be your in-class assessment grade for the day.
 - **Mini Assignment Progress** – at the end of class submit your current progress on the Mini Assignment. Each Lesson/Class will have problems to work on the last 45 minutes to an hour of class time. Once you submit your version, you will be able to see my solution to the assignment. You can then continue to work on the problems and grade your work. Your score for this will be based on effort put in during class rather than actual correctness, so make sure to self-grade your work for your own understanding as you move through the material.
 - For an Excused Absence (max of 2) to miss class, you can complete this outside of class (university activity, job interview, illness). You must formally request approval from the Canvas class home page.
 - No Late Assignments Accepted
 - **Top Hat** – must be in class to get credit and complete web-based quiz questions during class.
 - For an Excused Absence (max of 2) to miss class, you can complete this outside of class (university activity, job interview, illness). You must formally request approval from the Canvas class home page.
 - No Late Assignments Accepted
- **Optional Items**
 - **REWIND Materials** - Contains extra practice problems covering the lesson
 - Extra Credit Portion: Can add up to 30 points to Top Hat/Mini Assign Progress – due 2 weeks after class lesson (**No Late Work Accepted**) – for max of 100pts for both Top Hat and Mini Assign Progress.
 - **REVUP Materials** - Contains supplemental notes about the Lesson topics

Class Schedule

TUESDAY		THURSDAY	
Sep 11	Introduction to Programming: L1	Sep 13	Introduction to Programming: L2
Sep 18	Introduction to Programming: L3	Sep 20	Introduction to Programming Catch Up
Sep 25	Data Management: L1	Sep 27	Data Management: L2
Oct 2	Data Management: L3	Oct 4	Data Management Catch Up
Oct 9	Statistical Analysis: L1	Oct 11	Statistical Analysis: L2
Oct 16	Statistical Analysis: L3	Oct 18	Statistical Analysis Catch Up
Oct 23	Mid Term Project Work Day	Oct 25	Adv Data Management: L1
Oct 30	Adv Data Management: L2	Nov 1	Adv Data Management: L3
Nov 6	Adv Data Management Catch Up	Nov 8	Adv Statistical Analysis: L1
Nov 13	Adv Statistical Analysis: L2	Nov 15	Adv Statistical Analysis Catch Up
Nov 20	Final Project Work Day		

UNIVERSITY EXPECTATIONS, POLICIES, AND RESOURCES:

Students with Disabilities. A student who qualifies for academic accommodations because of a disability must submit a Faculty Letter to the instructor from the DU Disability Services Program (DSP) in a timely manner, so that the needs of the student can be addressed. Accommodations will not be provided retroactively, e.g., following an exam or after the due date of a project. DSP determines eligibility for accommodations based on documented disabilities. DSP is located in Ruffatto Hall, 1999 E. Evans Ave. (303-871-2278).

University Expectations. Please review the University Expectations on the Daniels College of Business syllabus webpage (<http://daniels.du.edu/university-expectations/>)

- University of Denver Honor Code
- Policy Concerning Official Communication
- Students with Disabilities
- Policy Concerning Religious Accommodations
- Policy Concerning Emergency Procedures
- Policy Concerning Conflicts of Interest, Including Gifts from Students