



**INTRODUCTION TO DATA  
ANALYTICS**  
BUSI2401/SECTION E, F & G  
WINTER 2025

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**Modality:** In-person

**Class Times:**

Section	Day & Time
Section E	Wednesday 11:35 am – 2:25 pm
Section F	Wednesday 2:35pm – 5:25 pm
Section G	Friday 2:35 pm – 5:25 pm

**In order to stay updated with important notifications and announcements from Carleton University, please download the Carleton University App. This will ensure you receive timely information regarding your courses and other university-related updates throughout the term.**

**Pre-requisites:** BUSI 1401

**Course Calendar Description** (from the [2024/2025 University Calendar](#))

This course prepares students to gather, manipulate, and clean data from a variety of sources within a programming environment. Students will be introduced to visual data exploration and the deployment of data-driven visual storytelling. Topics include: APIs, Data Science Programming, SQL, Relational/NoSQL databases, data visualization.

**Course Description:**

This course provides a foundational understanding of data analytics within the business context, equipping students with the essential tools and techniques to work with data effectively. Students will learn to gather, clean, and manipulate data from diverse sources. Through hands-on learning, students will be introduced to key concepts such as data wrangling, exploratory data analysis

(EDA), and visualization, using tools like Pandas and Matplotlib in Python. Special attention will be given to the use of Tableau, a leading platform for building dynamic, interactive dashboards and visual storytelling

## Drop Course Policy

The deadline for academic withdrawal follows the dates prescribed by Carleton University: <https://calendar.carleton.ca/academicyear/>

The deadline to drop this course with full fee adjustment is January 31<sup>st</sup>, 2025. The last day to withdraw from full winter courses is March 15<sup>th</sup>, 2025.

## Learning Outcomes:

At the completion of the course, students should:

1. Understand the different types of analytics and how they are applied to inform and solve complex business problems.
2. Understand and implement the fundamentals of functional programming using a current programming language and environment.
3. Ability to manipulate, and clean different types of data within a programming environment.
4. Ability to perform preliminary data analysis within a programming environment.
5. Understand the fundamentals of visual data discovery including the ability to select appropriate chart types and representation and identify trends and distributions.
6. Understand the fundamentals of visual data deployment including the ability to select and use pre-attentive attributes, design and implement dashboards, and effectively apply storytelling principles.

## Reading(s)/Textbook(s)/Required Materials

### Textbooks

- Downey, A., Elkner, J., Severance, C. and B. Ericson et al. (2021). Python for Everybody – Interactive Edition. (*Primary Reference. You can access free eBook. Click [HERE.](#)*)
- Miller, B., Boggs, J., and J.L. Pearce (2021). How to Think like a Data Scientist. Second Edition. (*Secondary Reference. You can access free eBook. Click [HERE.](#)*)

### Readings

- Wickham, H. (2014). Tidy Data. *Journal of Statistical Software*, 59(10), 1–23.
- Ranjan, J., & Foropon, C. (2021). Big data analytics in building the competitive intelligence of organizations. *International Journal of Information Management*, 56, 102231.
- Raghupathi, W., & Raghupathi, V. (2021). Contemporary business analytics: An overview. *Data*, 6(8), 86.

### Device

- Students need to bring their own laptops (windows or mac laptop) and power cable (if needed) for in-class exercises. It is also recommended to bring a mouse for the certain ICEs.

## Software

Anaconda	<p><i>This is a free software. You can download it here:</i></p> <ol style="list-style-type: none"> <li>1. Go to: <a href="https://www.anaconda.com/">https://www.anaconda.com/</a></li> <li>2. Click on <i>Free Download</i> on the top right corner</li> <li>3. Then follow the instruction to install it</li> </ol>
Python, Spyder Python IDE, & Jupyter Notebook	These will be installed automatically with Anaconda. You do not need to do any additional steps as long as you install Anaconda successfully.
Tableau Desktop	<ol style="list-style-type: none"> <li>1. You can download it here: <a href="https://www.tableau.com/">https://www.tableau.com/</a></li> <li>2. Make sure you install the software prior to the first class. A free license will be provided by professor in the first class. You can activate the software then.</li> </ol>
MS Excel	<ol style="list-style-type: none"> <li>1. Carleton Students can use Microsoft 365 (including various MS products, e.g., Word, PowerPoint, Excel, Teams, etc.) for free</li> <li>2. If you are not setting this up properly, please follow the instruction here: <a href="https://carleton.ca/its/help-centre/get-microsoft-office-for-students/">https://carleton.ca/its/help-centre/get-microsoft-office-for-students/</a></li> <li>3. It guides you on how to set up the free MS 365 account using your Carleton student email</li> </ol>
MS Teams	This is free for students. All inquiries on the course arrangement, assignments, exercises and so on will be via Teams. Officer hours will also be host via Teams. A course team has been created, please join the course team on Microsoft Teams ( <b>team code: i27w8dp</b> ) before our first class. You can find a quick instruction on how to join a team using team code <a href="#">HERE</a> .
CU Desktop (VDI)	<p>You do not need to use VDI if you can install abovementioned software on your device.</p> <p>If you can't, for whatever reason, Spyder and Jupyter are available through VDI. Tableau you must install on your own machine. It is not available through VDI.</p>

## Methods of Evaluation / Grading Scheme / Course Completion Requirements

In Class Exercises (10 × 2%)	20%
Assignment 1 (Python)	10%
Assignment 2 (Pandas)	15%
Assignment 3 (Visualization)	10%
Midterm Exam	20%
Final Exam	25%
<b>TOTAL</b>	<b>100%</b>

\*Assignments 1 & 2 are individual. Assignment 3 is a group assignment.

*Note: To receive a passing grade in this course students must complete all assignments, in class exercises, and exams. Additionally, students must get over 45% on a weighted average of the two exams.*

## **Midterm and Final Exam**

E-proctoring service will be used for both midterm and final exam.

The minimum computing requirements for e-proctoring service are as follows:

- Hardware: Laptop
- OS: Windows 10, Mac OS 10.14, Linux Ubuntu 18.04
- Internet Browser: Google Chrome, Mozilla Firefox, Apple Safari, or Microsoft Edge

Note: Chromebooks, tablets (Android, iOS, Windows), and smartphones are not supported by CoMaS at this time. You must complete your exams using Windows-based or MacOS computers.

### Midterm

The midterm is two hours long and is scheduled by examination services outside of class time. It is mandatory for students to write the exam at the scheduled time unless a medical reason or death in the family occurs. Both aforementioned scenarios require documentation. In these scenarios a deferred midterm must be written to pass the course.

### Final Exam

Scheduled during regular exam period. It is two hours long and is comprehensive, but more weight is given to the second half of the course.

### **Late Assignments:**

Late submission will be penalized 20% of the deliverable grade per day (e.g., an assignment graded 8 marks will be penalized 1.6 marks per day). No late deliverables will be accepted after 5 days past the stated deadline. Missing deliverable will receive a mark of zero, and there is no make-up assignment. Extensions may be granted in the case of exceptional circumstances. You must discuss these circumstances with your instructor at least 24 hours before the assignment due date. Please note that discussing the situation is not the same as merely informing your instructor.

*Note: Please keep an electronic copy for every exercise and assignment you submit.*

### **Deferred Examinations/Assignments:**

If you wish to defer a **Formal Final Exam**, you – the student – must reach out to the registrar's office with the proper documentation prior to the deadline (please refer to <https://carleton.ca/registrar/deferral/> for dates). Once the request has been put through, your instructor will be notified for their approval. Your final exam will be formally scheduled. If you miss the deadline for applying for a deferral, please reach out to your instructor personally to discuss.

### Deferred Midterm Date:

The ONLY date for a deferred midterm will be held on Monday, March 10, 2025, at 7:15 am in NI 4030. No other deferral options will be considered.

You will receive zero should you miss the deferred midterm.

### Preparation and Participation:

The course is highly intensive in its technical components, requiring students to engage in an immersive, hands-on experience throughout the semester. While there is less emphasis on theoretical concepts, students are expected to complete the required readings before each class to develop a deeper understanding of the technical components. This foundational understanding is especially crucial for success in the course.

### Course Schedule

*NOTE: While every attempt will be made to keep to the schedule listed below, unforeseen circumstances may necessitate modifications throughout the semester.*

Week	Topic / ICE & Assignments	Reading*
1	Course Administration / Introduction / Software Overview	
2	Getting started with Python I (functions / input / print) / ICE1	Ch. 1; Ch. 2; Ch. 5.1-5.3; 5.6-5.11
3	Getting started with Python II (conditionals & looping) / ICE2	Ch. 4 & 6
4	Getting started with Python III (lists, tuples & dictionaries) / ICE 3	Ch 9.1-9.9 & Ch. 10.1-10.4
5	Getting started with Python IV / ICE 4 Assignment 1 due: 11:59 pm, Feb 16	TBD
6	Data Retrieving, Cleaning, Exploration & Visualization I / ICE 5	TBD
Feb 17-21, 2024: Winter break, no classes.		
7	Data Retrieving, Cleaning, Exploration & Visualization II / ICE 6 Midterm Exam (outside of class time)	TBD
8	Data Retrieving, Cleaning, Exploration & Visualization III / ICE 7	TBD
9	Data Retrieving, Cleaning, Exploration & Visualization IV / ICE 8 Assignment 2 due: 11:59 pm, Mar 16	TBD
10	Visualization with Tableau I / ICE 9	TBD
11	Visualization with Tableau II / ICE 10	TBD
12	Course wrap-up & Final exam preview Assignment 3 Presentations: Apr. 2 (E & F), Apr. 4 <sup>th</sup> (G) Final Exam (Will be during regular exam period)	

\*NOTE: Additional weekly readings will be assigned throughout the term

**Contribution to Learning Goals of the Program ([BCom](#), [BIB](#)):**

<b>Program Learning Goal</b>	<b>Competencies Not Covered</b>	<b>Competencies Introduced (only)</b>	<b>Competencies Taught But Not Assessed</b>	<b>Competencies Taught and Assessed</b>
<b>BC1 Knowledge</b> <i>Graduates will be skilled in applying foundational business knowledge to appropriate business contexts.</i>		✓		
<b>BC2 Collaboration</b> <i>Graduates will be collaborative and effective contributors in team environments that respect the experience, expertise and interest of all members.</i>	✓			
<b>BC3 Critical Thinking</b> <i>Graduates will be discerning critical thinkers, able to discuss different viewpoints, challenge biases and assumptions, and draw conclusions based on analysis and evaluation.</i>		✓		
<b>BC4 Communication</b> <i>Graduates will be effective and persuasive in their communications.</i>			✓	
<b>BI5 Global Awareness (BIB ONLY)</b> <i>Graduates will be globally-minded.</i>	✓			

## ADDITIONAL INFORMATION

### Course Sharing Websites

Materials created for this course (including presentations and posted notes, labs, case studies, assignments, and exams) remain the intellectual property of the author(s). They are intended for personal use and may not be reproduced or redistributed without prior written consent of the author(s).

### Required calculator in BUSI course examinations.

If you are purchasing a calculator, we recommend any one of the following options: Texas Instruments BA II Plus (including Pro Model), Hewlett Packard HP 12C (including Platinum model), Staples Financial Calculator, Sharp EL-738C & Hewlett Packard HP 10bII

### Group work

The Sprott School of Business encourages group assignments in the school for several reasons. They provide you with opportunities to develop and enhance interpersonal, communication, leadership, followership, and other group skills. Group assignments are also good for learning integrative skills for putting together a complex task. Your professor may assign one or more group tasks/assignments/projects in this course. Before embarking on a specific problem as a group, it is your responsibility to ensure that the problem is meant to be a group assignment and not an individual one.

### Grading

In accordance with the Carleton University Undergraduate Calendar (p 34), the letter grades assigned in this course will have the following percentage equivalents:

A+ = 90-100	B+ = 77-79	C+ = 67-69	D+ = 57-59
A = 85-89	B = 73-76	C = 63-66	D = 53-56
A - = 80-84	B - = 70-72	C - = 60-62	D - = 50-52
F = Below 50			

Grades entered by Registrar:

WDN = Withdrawn from the course

DEF = Deferred

### Academic Regulations

University rules regarding registration, withdrawal, appealing marks, and most anything else you might need to know can be found on the university's website, here:

<http://calendar.carleton.ca/undergrad/regulations/academicregulationsoftheuniversity/>

### Requests for Academic Accommodation

Carleton is committed to providing academic accessibility for all individuals. You may need special arrangements to meet your academic obligations during the term. The accommodation request processes,

including information about the *Academic Consideration Policy for Students in Medical and Other Extenuating Circumstances*, are outlined on the Academic Accommodations website ([students.carleton.ca/course-outline](https://students.carleton.ca/course-outline)).

You may need special arrangements to meet your academic obligations during the term. For an accommodation request, the processes are as follows:

### **Pregnancy Accommodation**

Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website: [carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf](https://carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf)

### **Religious obligation**

Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website: [carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf](https://carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf)

### **Academic Accommodations for Students with Disabilities**

If you have a documented disability requiring academic accommodations in this course, please contact the Paul Menton Centre for Students with Disabilities (PMC) at 613-520-6608 or [pmc@carleton.ca](mailto:pmc@carleton.ca) for a formal evaluation or contact your PMC coordinator to send your instructor your Letter of Accommodation at the beginning of the term. You must also contact the PMC no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with your instructor as soon as possible to ensure accommodation arrangements are made. [carleton.ca/pmc](https://carleton.ca/pmc)

### **Survivors of Sexual Violence**

As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and its survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: [carleton.ca/sexual-violence-support](https://carleton.ca/sexual-violence-support)

### **Accommodation for Student Activities**

Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. <https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf>

For more information on academic accommodation, please contact the departmental administrator or visit: [students.carleton.ca/course-outline](https://students.carleton.ca/course-outline)



## Academic Integrity

Violations of academic integrity are a serious academic offence. Violations of academic integrity – presenting another’s ideas, arguments, words or images as your own, using unauthorized material, misrepresentation, fabricating or misrepresenting research data, unauthorized co-operation or collaboration or completing work for another student – weaken the quality of the degree and will not be tolerated.

Process: If an alleged violation occurs, all relevant documentation will be forwarded to the Dean. If the allegation proves true, the penalties may include; a grade of Failure on the submitted work and/or course; academic probation; a refusal of permission to continue or to register in a specific degree program; suspension from full-time studies; suspension from all studies at Carleton; expulsion from Carleton, amongst others. **For a first offence, at a minimum, the penalty assigned will normally be a zero on the submitted work and at least a minimum full grade reduction of the final course grade. For a second offence, at a minimum, the penalty assigned will normally lead to a suspension from studies.**

Students are expected to familiarize themselves with and follow the Carleton University Student Academic Integrity Policy which is available, along with resources for compliance at: <https://carleton.ca/registrar/academic-integrity/>.

## Sprott Student Services

The Sprott Undergraduate Student Services Office offers program advising and overall student success support. Our team is available to discuss your academic goals and your program progression plans. We can also work with you to develop strategies for success, including study skills for Business. If you experience any difficulty this term or if you would like to access support, please contact our team at [bcom@sprott.carleton.ca](mailto:bcom@sprott.carleton.ca) or at [bib@sprott.carleton.ca](mailto:bib@sprott.carleton.ca).

## Centre for Student Academic Support

The Centre for Student Academic Support (CSAS) is a centralized collection of learning support services designed to help students achieve their goals and improve their learning both inside and outside the classroom. CSAS offers academic assistance with course content, academic writing and skills development. Visit CSAS on the 4th floor of MacOdrum Library or online at: [carleton.ca/csas](http://carleton.ca/csas).

## Important Information:

- Students must always retain a copy of all work that is submitted.
  - All final grades are subject to the Dean’s approval.
  - For us to respond to your emails, we need to see your full name, CU ID, and the email must be written from your valid CARLETON address. Therefore, in order to respond to your inquiries, please send all email from your Carleton CMail account. If you do not have or have yet to activate this account, you may wish to do so by visiting <https://carleton.ca/its/get-started/new-students-2/>
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