# BUSI 2401: Introduction to Data Analytics
## Winter 2026

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| **Instructor** | Sam Khataei, PhD |
| **Email Address** | samkhataei@cunet.carleton.ca |
| **Class Times** | *Section E: Wednesdays 2:35 pm – 5:25 pm* |
| **Modality** | * Lectures will be ***in person***, not suitable for online students – the sessions include in-class exercises. |
| **Office Hours** | TBA |
| **Office Location** | *Zoom by appointment* |
| **TA Name/Email** | *TBA* |

### Pre-Requisites & Preclusions:

Prerequisites: BUSI 1401

### Course Description/Instructor's Statement

**BUSI 2401 [0.5 credit]**
**Introduction to Data Analytics**
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.

**Instructor's Description:**
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.

This course offers a foundational introduction to data analytics in a business context, providing students with the core skills and techniques needed to work with data effectively and efficiently. Students will learn how to collect, clean, and manipulate data from various data sources, and develop an understanding of essential concepts such as data wrangling, exploratory data analysis (EDA), and data visualization. The course focuses on hands-on learning using Python libraries such as Pandas and Matplotlib. In addition, students will gain practical experience with Tableau which is a leading tool for creating interactive dashboard and compelling data stories.

## Course Learning Objectives:

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

1. Explain the different types of data analytics and how they can be applied to address complicated business problems.
2. Understand and apply the fundamentals of functional programming using a modern programming language and development environment.
3. Clean, transform, and manipulate various types of data within a programming environment.
4. Conduct preliminary data analysis to extract insights and patterns using programming tools.
5. Demonstrate an understanding of visual data exploration, including selecting appropriate chart types and identifying 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 data storytelling techniques.

## Drop Course Policy

The deadline to drop this course with full fee adjustment is January 31, 2026. The last day to withdraw from full winter courses is March 15, 2026.

## Required/Optional Materials & Prices

**Students are not required to purchase textbooks or other learning materials for this course.**

*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 certain ICEs.

*Software*

1. Anaconda
   - *This is free software*. You can download it following the instructions below:
   - Go to: https://www.anaconda.com/
   - Click on *Free Download* in the top right corner
   - Then follow the instructions to install it

2. Python – Jupyter Lab
   o These will be installed automatically with Anaconda. You do not need to do any additional steps as long as you install Anaconda successfully.
3. Tableau Desktop
   o You can download it here: https://www.tableau.com/
   o 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.
4. MS Excel
   o Carleton Students can use Microsoft 365 (including various MS products, e.g., Word, PowerPoint, Excel, Teams, etc.) for free.
   o If you are not setting this up properly, please follow the instructions here: https://carleton.ca/its/help-centre/get-microsoft-office-for-students/
   o It guides you on how to set up the free MS 365 account using your Carleton student email
5. Brightspace
   o There is a Brightspace site for this course. All expected deliverables for this course are expected to be submitted through the Brightspace site. You will find your feedback there as well. It is important that you visit the site regularly to stay on top of the course. When communicating with the instructor, please use your Carleton University email and include the course number and section in your message.
6. CU Desktop (VDI)
   o You do not need to use VDI if you can install the abovementioned software on your device.
   o If you can't, for whatever reason, Jupyter is available through VDI. Tableau must be installed on your own machine. It is not available through VDI.

## Grading Scheme

Your final grade will be composed of the following:

| In-Class Exercises (10 x 2%) | 20% |
|---|---|
| Assignment 1 (Python) | 10% |
| Assignment 2 (Pandas) | 15% |
| Assignment 3 (Visualization) | 10% |
| Midterm Examination | 20% |
| Final Examination | 25% |
| **TOTAL** | **100%** |

\* **NOTE**: 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 and exams. Additionally, students must receive over 40% on a weighted average of the two exams.*

**Assignment, presentation, midterm exam, or final exam weights should not be shifted.**

## Important Dates to Note (Tentative)

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| Individual Assignment #1 (Python) | Feb 9, 2026 by 11:59 pm |
| Individual Assignment #2 (Pandas) | March 16, 2026 by 11:59 pm |
| Group Assignment #3 (Visualization) | The final week, during class time |
| Midterm Exam | TBD |
| Final Exam | TBD |

University Academic Calendar: https://calendar.carleton.ca/academicyear/

| **Policies & Accommodations** |
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https://students.carleton.ca/course-outline/
https://carleton.ca/pmc/current-students/academic-accommodations/

**Stay updated with important notifications and announcements from Carleton University, by downloading the Carleton University App!**

**Preparation and Participation:**

The course is technically intensive and requires students to engage in an immersive, hands-on experience throughout the semester. While theoretical content is limited, students are expected to complete the assigned readings before each class to build a solid understanding of the technical materials. This preparation is essential for meaningful participation and overall success in the course.

**Course Schedule\***

| Week # | Topic, ICE, & Assignments | Readings \*\* |
|---|---|---|
| 1 (Jan. 5) | **Welcome & Course Overview**<br><br>• Course administration<br>• Introduction<br>• Software overview | |
| 2 (Jan. 12) | **Getting started with Python I**<br><br>• Functions / input / print<br>• ICE 1 | Chapter 1; Chapter 2; Chapter 5.1 – 5.3; 5.6 – 5.11 |
| 3 (Jan. 19) | **Getting started with Python II**<br><br>• Conditionals & looping<br>• ICE 2 | Chapters 4 & 6 |
| 4 (Jan. 26) | **Getting started with Python III**<br><br>• Lists, tuples, & dictionaries<br>• ICE 3 | Chapter 9.1 – 9.9 & Chapter 10.1 – 10.4 |

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| 5 (Feb. 2) | **<u>Getting started with Python IV</u>**<br><br>• ICE 4<br>• Assignment #1 due on Feb 9 by 11:59 pm | Chapter 5.1-5.3 & Chapter 5.6-5.11 |
| 6 (Feb. 9) | **<u>Data manipulation I</u>**<br><br>• Data retrieving, cleaning, exploration, & visualization I<br>• ICE 5<br><br>***<u>Midterm Exam (outside of class time)</u>*** | TBD |
| Feb. 16 | ***Winter Break – no classes*** | |
| 7 (Feb. 23) | **<u>Data manipulation II</u>**<br><br>• Data retrieving, cleaning, exploration, & visualization II<br>• ICE 6 | TBD |
| 8 (Mar. 2) | **<u>Data manipulation III</u>**<br><br>• Data retrieving, cleaning, exploration, & visualization III<br>• ICE 7 | TBD |
| 9 (Mar. 9) | **<u>Data manipulation IV</u>**<br><br>• Data retrieving, cleaning, exploration, & visualization IV<br>• ICE 8<br>• Assignment #2 due on March 16 by 11:59 pm | TBD |
| 10 (Mar. 16) | **<u>Visualization with Tableau I</u>**<br><br>• ICE 9 | TBD |
| 11 (Mar. 23) | **<u>Visualization with Tableau II</u>**<br><br>• ICE 10 | TBD |
| 12 (Mar. 30) | **<u>Course wrap-up & Final Exam Preview</u>**<br><br>• Assignment #3 Presentations<br><br>Final Exam (will be scheduled by the University during the regular exam period) | |
| 13 (April. 6) | **<u>NO CLASS</u>** | |

\* Note: Although the schedule outlined above is expected to be followed, unforeseen circumstances may require adjustments during the semester.

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

**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) in cases without medical certificates. ***No late deliverables will be accepted after 5 days past the stated deadline***. Missing deliverables will receive a mark of 0 [zero], and there is *no make-up assignment*. Extensions may be granted in the case of exceptional circumstances such as verifiable illness and emergencies. You must discuss these circumstances with your instructor at least 24 hours (two days) 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 of every exercise and assignment you submit.*

**Midterm and Final Exam**

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

*Please note that tests and examinations in this course will use a mandatory remote proctoring service provided by Scheduling and Examination Services. You can find more information at https://carleton.ca/ses/e-proctoring/.*

*Students are responsible for ensuring that the application is working properly on your computer during the exam. Failure to ensure proper functioning of CoMaS will constitute a violation of the exam rules and may be grounds for an allegation that you have violated the Academic Integrity Policy.*

***The minimum computing requirements for this 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*
*Internet Connection (High-Speed Internet Connection Recommended)*
*Webcam (HD resolution recommended)*

**Note: Chromebooks, tablets (Android, iOS, Windows), and smartphones are not supported. 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 extenuating circumstances (such as a death in the family, etc.) occur. Both aforementioned scenarios require documentation. In these scenarios, *a deferred midterm must be written* to pass the course.

Final Exam

Scheduled during the University's regular final examination period. It is *two hours long* and is comprehensive, but more weight is given to the second half of the course.

**Deferred Midterms:**

In the event that you are unable to write a **midterm** due to extenuating circumstances (such as a death in the family, illness, etc.), you must provide appropriate supporting documentation to your professor. Upon review, a deferred test may be offered. Please note that students who do not provide valid documentation or fail to offer a reasonable explanation for missing the midterm will receive a grade of 0% for that test.

**The deferral midterm will be held on** *Monday, Feb, 23rd, 2025, at 7:15 am* **in NI 4030. No other deferral options will be considered. You will receive 0 [zero] if you miss the deferred midterm.**

**Deferred final exams:**

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.

**Use of Generative Artificial Intelligence**

*This is a human-centered course.* In this course, evaluation focuses on **what you can do independently and without AI assistance**. While you are welcome to use generative AI tools to **explore ideas, study, or clarify concepts**, all submitted work must represent **your own thinking, your own coding, and your own problem-solving process**.

AI may be used **at your own risk**, and **AI is strictly prohibited on all quizzes, midterms, and final exams**. AI's role is to support your learning when you get stuck—not to produce work for you. **Copying and pasting AI-generated answers is STRICTLY not allowed** and is not an effective way to learn the material in this course.

Use AI as a study aid, not as a shortcut. Your understanding and reasoning—not AI output—form the basis of assessment. **Using AI for graded submissions constitutes an academic integrity violation.**

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

| Program Learning Goal | Competencies Not Covered | Competencies Introduced (only) | Competencies Taught But Not Assessed | Competencies Taught and Assessed |
|---|---|---|---|---|
| **BC1 Knowledge** *Graduates will be skilled in applying foundational business knowledge to appropriate* | | X | | |

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| *business contexts.* | | | | |
| **BC2 Collaboration** *Graduates will be collaborative and effective contributors in team environments that respect the experience, expertise and interest of all members.* | X | | | |
| **BC3 Critical Thinking** *Graduates will be discerning critical thinkers, able to discuss different viewpoints, challenge biases and assumptions, and draw conclusions based on analysis and evaluation.* | | X | | |
| **BC4 Communication** *Graduates will be effective and persuasive in their communications.* | | | X | |
| **BI5 Global Awareness (BIB ONLY)** *Graduates will be globally-minded.* | X | | | |

## 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:

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| 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).

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**

**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**

**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 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**

**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**

**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**

**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 or at 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.

**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/