

# **DATA 5000: DATA SCIENCE SEMINAR**

**Course Syllabus**



## 1. General Course Information

**Course Title:** Data Science Seminar  
**Credit Weight:** 0.5 credits  
**Prerequisites:** None  
**Instructor:** Dr. Ahmad Teymouri  
    **Title:** Part-Time Professor  
    **Phone:** (613) 520-2600  
    **Email:** [ahmadteymouri@cunet.carleton.ca](mailto:ahmadteymouri@cunet.carleton.ca)

## 2. Course Description

Cloud based distributed systems, statistics, machine learning, use of complex ecosystems of tools and platforms, data ethics, and communication skills to explain advanced analytics. Students choose a project in Big Data management and/or analysis, deliver a paper and give a class presentation on their findings.

## 3. Course Rationale

Students will examine the role of data science in a modern organization and will be able to apply the best practices-based methodology and techniques to solve real-world data science problems

## 4. Course Learning Objectives

After successfully completing this course, you will be able to:

- CO1. Explain the role of data science and data scientists in a modern organization.
- CO2. Apply best practices-based methodology to complete data science projects.
- CO3. Apply data pre-processing techniques.
- CO4. Apply data visualization and exploration techniques to explore and analyze data.
- CO5. Apply machine learning algorithms to solve data science problems.

## 5. Course Modality: Asynchronous

This is a fully online course where instructors and students share information, ideas, and learning experiences in a virtual course space. Asynchronous courses do not require participation in scheduled meetings. However, students are expected to remain up to date with the deadlines and due dates provided by the instructor. This course requires high-speed Internet access and a computer.

### Technical Skills:

Minimum technical skills for the course:

- [Essential Technological Skills for Students](#) include but are not limited to:

- Knowledge of how to transfer and share files
- Understanding of digital storage software
- Digital presentation skills
- Advanced word processing skills
- Tips for [Learning in an Online Environment](#)
  - Preparing to learn in an online environment
  - Recommended technical requirements

Please note that all Carleton students receive free access to Microsoft 365 / Office.

- [Get Microsoft Office for Students](#)

## 6. **Student Support**

### **Academic Support**

The Centre for Student Academic Support (CSAS) is a collection of student support services designed to help you achieve your goals and improve your learning.

- CSAS can help you with academic reading, academic writing, critical thinking, time management, and more.
- For complete information on their workshops and other services, please visit the [Centre for Student Academic Support](#).

### **Technical Support**

A variety of technical support options are available to students on our [Brightspace Student Support](#) page through documentation and videos, including information on:

- How to use Brightspace
- Communication and collaboration
- Assessments

Students can access support by phone, chat or email by contacting the [D2L Brightspace Service Desk](#).

### **Health and Wellness Support Services**

Carleton offers a wide range of Student Support Services, including resources for mental health, healthy living, getting active, and getting support. For complete information on resources, please visit: [Carleton Wellness Resources: Supporting Your Mental Health](#).

## 7. **Course Schedule**

Please regularly check and log into Brightspace to review new content. Configure your personal notifications to opt into course announcements so that they will be emailed to your Carleton email address.

Module	Topics	Materials	Deliverable
<b>Getting started</b>	Getting started. The course plan.	N/A	<ul style="list-style-type: none"> <li>Introduce yourself discussion due on Day 7 of Week 1.</li> </ul>
<b>Setting the Stage</b>	Current industry trends. Data science and AI pitfalls. Data science life cycle. The role of the data scientist.	N/A	<ul style="list-style-type: none"> <li><b>Paper selection due on Friday of Week 1.</b></li> </ul>
<b>It's All About the Data</b>	The evolution of data analytics. Accelerator technologies for analytics.	N/A	<ul style="list-style-type: none"> <li>Business vs. operational intelligence discussion due on Day 7 of Week 2.</li> <li>Traditional vs. cloud computing discussion due on Day 7 of Week 2.</li> </ul>
<b>Working with Data</b>	Accessing data. Data pre-processing. Visualizing data.	N/A	<ul style="list-style-type: none"> <li>Data exploration and visualization discussion due on Day 7 of Week 3.</li> <li><b>Paper review presentation due on Friday of Week 3.</b></li> </ul>
<b>Introduction to Machine Learning</b>	Introduction to machine learning. Evaluating machine learning model performance.	N/A	<ul style="list-style-type: none"> <li>Evaluating machine learning performance discussion due on Day 7 of Week 4.</li> <li>Types of machine learning discussion due on Day 7 of Week 4.</li> </ul>
<b>Machine Learning Algorithms 1</b>	Machine learning algorithms 1.	N/A	<ul style="list-style-type: none"> <li>Best algorithm for the job 1 discussion due on Day 7 of Week 5.</li> </ul>
<b>Machine Learning Algorithms 2</b>	Machine learning algorithms 2.	N/A	<ul style="list-style-type: none"> <li>Best algorithm for the job 2 discussion due on Day 7 of Week 6.</li> </ul>
<b>Course Project</b>	Your course project.	Computational resources as needed.	<ul style="list-style-type: none"> <li><b>Project proposal due on Friday of Week 3.</b></li> <li><b>Project presentation due on Friday of Week 6.</b></li> <li><b>Project report due on the last day of the semester according to the Carleton University Registrar's Office course schedule.</b></li> </ul>

## 8. Learning Materials

### Textbook

No specific textbook is required Please refer

## Other Resources

Several of the course modules include sub-modules containing links to extra self-help learning resources. These resources are provided to help students build extra skills relevant to their projects. Use of these resources is completely optional.

If, while planning the course project, it becomes clear that additional computational resources are required, the student is encouraged to reach out to the instructor to see if access to additional resources can be arranged.

## 9. Grading Scheme

Activity	Scored Out of	Percent of Total Grade
Graded discussions	1 (each)	10%
Paper review presentation	10	10%
Project proposal	15	15%
Project presentation	15	15%
Project report	50	50%
	100	100%

## Grading

The [Carleton University grading system](#) will be used to determine your final course grade. Letter grades correspond to the following percentages:

Percentage	Final Grade
90 - 100	A+
85 - 89	A
80 - 84	A-
77 - 79	B+
73 - 76	B
70 - 72	B-
67 - 69	C+
63 - 66	C
60 - 62	C-
57 - 59	D+
53 - 56	C
50 - 52	D-
0 - 49	F

Final grades in this course are determined by the course instructor and must be approved by the Dean. Grades submitted by the instructor are subject to revision and should not be considered final until they have been approved by the Dean.

Please keep in mind that points for individual assessment and thus your final grades are added, rather than deducted – i.e., you all start with 0 and work your way up, rather than starting at 100 and having points reduced from there. A subtle but important point.

## Late Assignments

Late assignments are not accepted for any reason and will earn a grade of 0 on that assignment. Requests for extension will be considered in cases of illness, family emergency, or other exceptional circumstances.

## 10. Course Evaluation

At the end of this course, students are encouraged to complete a course evaluation that will be distributed to them via email and through a course link.

## 11. Contribution to Program Learning Goals

MBA Learning Goal	Covered	Introduced	Taught but <u>not</u> Assessed	Taught <u>and</u> Assessed
<b>MB1 Leadership and Collaboration</b> <i>Graduates will be equipped for leadership and collaboration.</i>	Yes	Yes	Yes	Yes
<b>MB2 Communication</b> <i>Graduates will be effective communicators</i>	Yes	Yes	Yes	Yes
<b>MB3 Critical Thinking and Problem-Solving</b> <i>Graduates will be skilled in critical thinking and problem solving.</i>	Yes	Yes	Yes	Yes
<b>MB4 Functional Knowledge</b> <i>Graduates will have knowledge that is relevant to business and be able to apply that knowledge to address business issues, opportunities, and risks.</i>	Yes	Yes	Yes	Yes
<b>MB5 Global Awareness</b> <i>Graduates will have an appreciation of the global environment of business.</i>	Yes	Yes	Yes	Yes
<b>MB6 Ethics and Responsible Management</b> <i>Graduates will apply ethical considerations and principles of responsible management in business decision-making.</i>	Yes	Yes	Yes	Yes

## 12. Group Work

Students will work on their project individually. Group work is not permitted.

## 13. Communication

Brightspace and email are the primary means of communicating with the instructor. See the [Student Support Site](#) for more information. Please do not call the instructor's office phone.

To respond to your emails, instructors and administrators need to see your full name and Carleton University ID. For this reason, it is important to send all messages from your Carleton email account. If you do not have or have yet to activate this account, you can do so by visiting the [New Students page](#).

### Instructor Response Times

Assignments will be graded with feedback (if needed) within a week. Expect to receive a reply to your question(s) within 24 hours, Monday through Friday, unless otherwise posted by the instructor.

### Netiquette (Online Etiquette)

Please use the following rules of netiquette as you post to online discussions and send messages to your instructor and other students in the course:

Use **professional language**. Be positive and constructive in your feedback to replies to students. Be polite by including please and thank you. Use inclusive language and terminology.

**Avoid ALL CAPS**. This comes across as shouting to the reader. Instead, use **bold** formatting to emphasize words.

Use **proper language and titles** and avoid slang or profanity. Even if a word is one you consider to be "not so bad", it could be offensive to others.

**Review posts and messages before saving**. Check for grammar and spelling errors and restate your message when necessary.

**Ask for clarification**. If you do not understand an assignment or feedback from the instructor, please ask for clarification. Instructors do their best to word posts/messages as clearly as possible, but in an online environment they cannot "see" if their messages are being understood.

## 14. Academic Regulations

University rules regarding registration, withdrawal, appealing marks, and related matters can be found at [General Graduate Regulations](#).

## 15. Requests for Academic Accommodation

Carleton University is committed to academic accessibility for all individuals. Academic accommodation refers to educational practices, systems, and support mechanisms that accommodate diversity and difference and allow students to perform the essential requirements of their academic programs. The processes for submitting these requests are as follows:

### Pregnancy

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, please visit the [Equity Services website: Student Guide to Academic Accommodation](#).

### Religious Obligations

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, please visit the [Equity Services website: Student Guide to Academic Accommodation](#).

### Students with Disabilities

If you have a documented disability that requires academic accommodation 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 due date of the first assignment or exam for which you require accommodation. After requesting accommodation from PMC, be sure to communicate with your instructor to ensure that the necessary accommodation arrangements are in place.

### 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's Sexual Violence Policy](#).

For more information on academic accommodation, please consult Carleton's [Course Outline Information on Academic Accommodation](#).

## 16. Academic Integrity



Carleton University's Academic Integrity Policy defines plagiarism as "*presenting, whether intentionally or not, the ideas, expression of ideas or work of others as one's own.*" This includes reproducing or paraphrasing portions of someone else's published or unpublished material, regardless of the source, and presenting these as one's own without proper citation or reference to the original source.

Plagiarism is a serious offence that cannot be resolved directly by the course instructor. The Associate Dean of the Faculty conducts a rigorous investigation, including an interview with the student, when an instructor suspects a piece of work has been plagiarized. Penalties are not trivial. They can include a final grade of "F" for the course.

Examples of plagiarism include, but are not limited to:

- Any submission prepared in whole or in part by someone else;
  - Using ideas or direct, verbatim quotations, paraphrased material, algorithms, formulae, scientific or mathematical concepts, or ideas without appropriate acknowledgment;
  - Using someone else's data or research findings without acknowledgement;
- Failing to acknowledge sources through the use of proper citations when using another's work and/or failing to use quotations marks.

Violations of academic integrity also include:

- Using unauthorized material when completing an assignment or exam,
- Fabricating or misrepresenting research data;
- Unauthorized co-operation or collaboration, and;
- Completing work for another student.

Academic integrity violations constitute a serious academic offence, weaken the quality of the degree, and will not be tolerated. Penalties may include: a failing grade for 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, and; expulsion from Carleton.

Students should familiarize themselves with and follow the Carleton University Student Academic Integrity Policy, which is available, along with resources for compliance, at: [Student Academic Integrity Policy](#).

## 17. Course Copyright

Materials used in this course—including lectures, PowerPoint presentations, discussions, learning activities, posted notes, case studies, assignments, and exams—are copyright protected and remain the intellectual property of their respective author(s). They are intended for personal use and may not be reproduced or redistributed without prior written consent of the author(s).

Students registered in this course may take notes and make copies of course materials for their own educational use only. Students may not reproduce or distribute lecture notes and course materials publicly for commercial or non-commercial purposes without express written consent from the copyright holder(s).

## **18. Equity and Inclusion**

All members of the Carleton University community share responsibility for ensuring that the University's educational, work and living environments are free from discrimination and harassment. Should you have concerns about harassment or discrimination relating to your age, ancestry, citizenship, colour, creed (religion), disability, ethnic origin, family status, gender expression, gender identity, marital status, place of origin, race, sex (including pregnancy), or sexual orientation, please visit the website of Carleton's [Department of Equity and Inclusive Communities](#).