CPS493-04: Data Science

Course Description
Data Science, or Data Analytics, is the practice of creating and applying data-centric software used to extract actionable knowledge and insights from a collection of heterogeneous data sources that answer specific scientific, socio-political, or business questions. Data science has been called "the sexiest job in the 21st century", and the demand for data scientists is expected to far exceed the available supply in the near future. Data science incorporates practices from a variety of fields including statistics, machine learning, databases, distributed systems, algorithms, data warehousing, high-performance computing, and visualization. This course will cover the fundamental concepts in data science, to equip students with the key skillset toward becoming good data scientists.

Course Details

Credit Hours: 3

Class Days, Time, Location:
Tuesdays and Fridays: 12:30PM-1:45PM, SH259

[**Course Modality**](#)**:**
- *Fully Seated*
- *WebEx:* https://newpaltz.webex.com/join/chenm

Pre/Co-requisites: *N/A*

Instructor Details

Name and Title: Min Chen, Associate Professor

Pronouns: She/Hers

Campus Email: chenm@newpaltz.edu

Office Phone: X-3547

Office Location: SH255

Office Hours: Tuesdays /Fridays: 11:00AM-12:00PM, Wednesdays: 10:00AM-12:00PM

Student Learning Outcomes

The course will cover a broad variety of tools and techniques, and will focus on breadth rather than depth. Students will learn how to model and reason about data, and how to process and manipulate it in various ways. The aim is to bring student with basic programming and data structure background to be abreast with common tools used for Data Science application development. By the end of this course the student will be able to:
- have a general knowledge of the field of data science;
- be familiar with big data applications;
- implement and design standard algorithms for data science;
- be able to evaluate the performance of the algorithms and new techniques encountered.

Reading Materials

There is no textbook for the course. A list of online resources will be provided on Brightspace.

Attendance / Participation

- Attendance (5%).
- Two unexcused absences
- Students who believe they have an illness that will prevent them from attending class should contact [Student Health Services (SHS)](#) promptly. Under some circumstances, SHS will provide students with "professor notes" to share with faculty for their approval of absence. Please be advised that no retroactive notes will be given.

Grading Information

Progress in the course will be reflected in assignment and examination grades covering the subject areas in the course. There will be homework, project, and tests:

- Homework and Tests: 60%. Assignments will be made regularly; If you keep up with, and do well on the homework assignments/in-class quizzes, it is very likely you will do well on the exams. (No Final Exam).

- Project and Final Report: 35% (5% proposal, 5% progressive report, 5% presentation, 10% code and 10% final report). The project provides an opportunity for you to use the knowledge from class to build something interesting of your choice. Projects could be done in groups of up to three.

Grade Scale by Weighted Percentage

A	*100.00 – 93.00 (4.0)*	*A-*	*92.9 – 90.00 (3.67)*
B+	*89.9 – 87.10 (3.33)*	*B*	*87.00 – 83.00 (3.0)*
B-	*82.9 – 80.00 (2.67)*	*C+*	*79.9 – 77.10 (2.33)*
C	*77.00 – 73.00 (2.0)*	*C-*	*72.9 – 70.00 (1.67)*
D+	*69.9 – 67.10 (1.33)*	*D*	*67.00 – 60.00 (1.0)*
F	*Below 60 (0.00)*		

Generative AI Tools

AI Exploration

AI is used creatively to enhance problem-solving, generate novel insights, or develop innovative solutions to solve problems. Students and educators co-design assessments to explore unique AI applications within the field of study.

You should use AI creatively to solve the task, potentially co-designing new approaches with your instructor.

Last Day to Withdraw without Grade Penalty

Fall 2025: November 14; Spring 2026: April 7

Campus Policies

1. Academic integrity policy statement: Students are expected to maintain the highest standards of honesty in their college work. Cheating, forgery, and plagiarism are serious offenses, and students found guilty of any form of academic dishonesty are subject to disciplinary action. New Paltz's policy on academic integrity is

found at www.newpaltz.edu/ugc/policies/policies_integrity.html, and several excellent resources to help with avoiding plagiarism are available on the Sojourner Truth Library's website: lib.newpaltz.edu/assistance/plag.html.

2. Reasonable accommodation of individuals with disabilities statement: Students needing classroom and/or testing accommodations related to a disability should contact the Disability Resource Center (Student Union, Room 210, 845-257-3020) as close as possible to the beginning of the semester. The DRC will then provide students' instructors with an Accommodation Memo verifying the need for accommodations. Specific questions about services and accommodations may be directed to Deanna Knapp, Assistant Director (knappd@newpaltz.edu) or Jean Vizvary, Director (vizvaryj@newpaltz.edu).

3. Veteran & Military Services statement: New Paltz's Office of Veteran & Military Services (OVMS) is committed to serving the needs of veterans, service members and their dependents during their transition from military life to student life. Student veterans, service members or their dependents who need assistance while attending SUNY New Paltz may refer to www.newpaltz.edu/veterans; call 845-257-3120, -3124 or -3074; e-mail np-vms@newpaltz.edu; or stop by the Student Union, Room 100 South.

4. Computer and network policies statement: Users of New Paltz's computer resources and network facilities are required to comply with the institutional policies outlined in the Acceptable Uses and Privacy Policy, available at www.newpaltz.edu/itpolicy/.

5. Identity verification policy statement for online courses: New Paltz's Online Identity Verification Policy is designed to verify that students enrolled in our online courses and/or programs are the ones who take the courses, complete the programs, and receive the academic credit. See www.newpaltz.edu/ugc/policies/policies_onlineverification.html for the complete policy.

6. Taking Care: Illness and Absences
While the national COVID-19 public health emergency has ended, SUNY New Paltz still has policies in place to protect the health of our community. **Click here to view COVID-19 FAQs and up-to-date information about those policies**. Students with an illness that prevents them from attending class (COVID-19, influenza, etc.) should exercise self-care and consult the testing recommendations on the Student Health Service (SHS) website. Faculty will receive "professor notes" from the SHS when a student has an illness that prevents them from attending class.

Student Evaluation of Instruction (SEI)
You are responsible for completing the Student Evaluation of Instruction (SEI) for this course and for all your courses with an enrollment of five (5) or more students. I value your feedback and use it to improve my teaching and planning. Please complete the online form during the appropriate period: November 24-December 8 (Fall 2025); April 22-May 5 (Spring 2026).

Summary of Topics Covered and Course Schedule
Main Topics:
- Introduction, Collection and Wrangling
- Data preparation
- Data visualization
- Data analysis
- Model implementation
- Working with Big Data

Schedule

Calendar	Week	Tuesday	Friday	Tasks Due

Aug/Sep 2025	Week No 1	**26** Class will be Online	**29**	
	Week No 2	**2** Class will be Online	**5**	
	Week No 3	**9**	**12**	
	Week No 4	**16**	**19**	Assignment 1
Sep/Oct 2025	Week No 5	**23** Class will be Online (Proposal)	**26**	Exam 1
	Week No 6	**30**	**3**	
	Week No 7	**7**	**10**	
	Week No 8	**14** Fall Break-no Class	**17**	Assignment 2
	Week No 9	**21**	**24**	Exam 2
Oct/Nov 2025	Week No 10	**28**	**31**	

	Week No 11	4	7	
	Week No 12	11 Class will be Online (Progress)	14	Assignment 3
	Week No 13	18	21	Exam 3
Nov/Dec 2025	Week No 14	25	28 No Classes	
	Week No 15	2 Presentation	5 Presentation	
	Week No 16	9	12	Final Report/Code
	Week No 17	16	19	