Lecture 1-1: Course Overview

DATA 510: Data Science Capstone

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Orienting lecture for DATA 510: catalog goals, grading components and weights, milestone and weekly deliverable schedule, Data-Driven Scrum methodology, meta-project clusters, late policy, attendance and integrity expectations, and workload norms aligned with the published syllabus.

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1 Learning objectives

1.1 Today's objectives

1.2 What you will leave with

By the end of this session, you will be able to:

1. **Explain** how the capstone grade is built from milestones, process habits, and communication deliverables (including where to find authoritative due dates).
2. **Describe** team options, meta-project clusters, and why weekly DDS rituals exist.
3. **Locate** major milestone due weeks on the semester calendar and what each milestone is meant to prove.
4. **Apply** the late-work grace rule correctly (including known exemptions).

This deck summarizes the syllabus and methodology pages; Canvas remains authoritative when specifics differ.

2 Part 1: What this course is

2.1 DATA 510 in one paragraph

Over the semester you **propose, plan, and execute** a real data science project that integrates core MS program skills and produces a **portfolio-quality** artifact aligned with your career goals.

Projects should be **consequential**: plausible impact on an organization or problem domain. Grades reward **steady progress**, **communication quality**, and how you **present and defend** work (including feedback from industry judges where applicable).

2.2 Meeting logistics

Classes meet **Monday**, **6:00 PM to 10:00 PM**, **Ford 102**.

Each evening typically splits into two blocks (**6:00 to 7:30 PM** and **8:00 to 10:00 PM**). Expect a blend of seminar discussion, short lectures, group work, mentoring, and guests (the mix may shift with guest schedules).

2.3 Catalog framing

You will:

- Select data sources that are **publicly available or publishable**, with **instructor approval early in the term** (target data decisions inside the first two weeks alongside chartering and proposal work).
- Experience checkpoints that mimic **consistent workplace deadlines**, with structured peer and instructor feedback.

2.4 Prerequisites and materials

Prerequisites: DATA 501, DATA 502, DATA 503, DATA 504.

Minimum grade: A grade of **C- or better** is required for this course to count toward university credit.

Textbook: None. Readings and links will appear in **Canvas**.

2.5 Course objectives (official)

1. Implement **modern development practices** that support publication and presentation of a data science project.
2. Discuss **recent developments** in data science and their organizational and societal implications intelligently.
3. **Propose and defend** a data-science-based solution to a problem of consequence.
4. Communicate implications **clearly to non-technical audiences**, in person and in writing.
5. Demonstrate readiness for **professional interview** settings on core data science topics.

2.6 Student learning objectives (high level)

You will practice how to:

- **Navigate hiring** and interview effectively (professional development sequence).
- **Market your strengths** through GitHub presence, the final write-up, and public artifacts.
- **Plan** a large research project end-to-end with realistic timelines (proposal and milestones).
- **Execute** on that plan across graded checkpoints (milestone submissions).
- **Present** findings interactively to technical and non-technical audiences (final poster session and rehearsals).
- **Write** for modern publication on the web (rough and final drafts).
- **Collaborate** so workloads split fairly when you choose team execution.

Student learning objectives map directly onto graded components such as professional development, milestones, and the final presentation and write-up.

3 Part 2: How your grade is built

3.1 Grade components at a glance

Canvas combines weighted components below. **If anything here disagrees with a dated Canvas announcement or assignment page, follow Canvas.**

Component	Weight
Professional development activities	10%
Weekly peer and meta-project evaluations	5%
Project process and practices (includes Git workflow)	5%
Technical writing practice	5%
Project proposal	9%
Data summary	9%
Poster rough draft	8%
Written report rough draft	9%
Final poster presentation	18%
Final write-up	14%
Project website and dissemination	8%
Total	**100%**

3.2 Letter grade cutoffs

Average	Letter
92.00+	A
90.00 to 91.99	A-
88.00 to 89.99	B+
82.00 to 87.99	B
80.00 to 81.99	B-
78.00 to 79.99	C+

Average	Letter
72.00 to 77.99	C
70.00 to 71.99	C-
68.00 to 69.99	D+
62.00 to 67.99	D
60.00 to 61.99	D-
59.99 and below	F

3.3 Ongoing coursework (what those percentages mean)

Professional development (10%). Every other week (or so) opens with structured career preparation (even if you are not job searching immediately).

Weekly peer and meta-project evaluations (5%). Short structured reflections on your team and the **two peer projects** in your assigned cluster (quality of feedback you gave, what you learned, risks you see).

Project process and practices (5%). Includes **Git workflow**, chartering, weekly summaries, and related habits. Git commit quality is reviewed weekly; grading for improvement incorporates feedback especially in the **last five weeks** of the term.

Technical writing practice (5%). In-class exercises with discussion. **Partial credit only** for makeup work if you miss the class session.

3.4 Project milestones (weighted artifacts)

Project proposal (9%). Short plan covering the research question, data sources, planned analysis, ethics notes, and feasibility. It is the **default roadmap** when scope needs to tighten.

Data summary (9%). Evidence that needed data are gathered and organized **or** pipelines run without ongoing manual babysitting. After this milestone, **no further active ingestion work** should be required.

Poster rough draft (8%). First **end-to-end story** on the wall; placeholders allowed, but the narrative arc should be complete enough to critique.

Written report rough draft (9%). First full draft of publishable prose across required sections. After this milestone, **no further methodology or findings changes** (editing and polish continue).

3.5 Final deliverables

Final poster presentation (18%). Conference-style poster session for peers, faculty, and industry guests; **joint across cohorts** on the **last class evening**.

Final write-up (14%). Polished, proofread permanent record; published and linked from portfolios.

Project website and dissemination (8%). Public-facing project materials (for example **GitHub Pages**) with clear links suitable for employers.

Rubric details live with each Canvas assignment; ask early if a component's expectations are unclear.

4 Part 3: Methodology and teamwork

4.1 Team size and meta-projects

You may work **solo** or in a **self-selected team of two or three**.

Regardless of team size, every project sits in a **meta-project cluster**: your capstone is grouped with **two other projects for the whole semester**. You follow those peers closely and give **structured weekly feedback** (and receive it).

4.2 Higher bar for multi-person teams

Teams of **two or three** should carry **noticeably higher scope, risk, or surface area** than a comparable solo project (integration depth, evaluation rigor, division of labor, documentation).

Instructor approval of team scope happens at the **project proposal**. Proposals that look like solo scope with extra names should expect revision requests.

4.3 Data-Driven Scrum (DDS): why it exists

DDS is the course operating model for transparent, prioritized iteration tailored to data science.

It emphasizes:

- **Collaboration and communication** through visible boards and weekly narratives.
- **Empirical iteration** (short cycles of ideate, build, observe, analyze).
- **Highest priority next** through backlog refinement.

4.4 DDS flow (weekly rhythm)

1. **Brainstorm** concrete backlog items (stories, spikes, experiments).
2. **Prioritize** against data and modeling constraints.
3. **Create and refine** artifacts tied to the top item.
4. **Observe** results and **reprioritize** honestly.

Core artifacts include **items**, **backlog**, **item breakdown board (IBB)**, **task board**, and the **weekly progress report** (often README updates plus snapshots when required).

4.5 Written weekly cycle (GitHub)

README or the filename specified in Canvas should routinely cover:

- **Iteration review:** what shipped and board snapshot.
- **Retrospective:** one process improvement for next cycle.
- **Planning:** which backlog items you pulled next and why.

4.6 In-class rituals

Standups and **backlog refinement** are **in-class work**, expected **finished by the end of the evening session**, including cross-team touchpoints inside your meta-project cluster.

Written follow-ups post by **Canvas deadlines**.

4.7 Meta-project reviews (what good feedback looks like)

Each week you:

- Read peer **boards and weekly summaries**.
- Give **specific, kind** feedback tied to artifacts (not personalities).
- Incorporate useful signals into your backlog; clarify politely when peers misread context.

Strong comments cite **visible evidence**, separate **curiosity** from **blocking risks**, and surface **ethics and engineering** concerns early (PII, leakage, reproducibility).

5 Part 4: Policies and expectations

5.1 Late work

Each deliverable has a **24-hour grace window** after the stated deadline with **no penalty**.

Beyond that you lose **20% of that deliverable's points per day** late.

Exceptions (no grace window): Final presentations (single shared slot), **writing assignments** tied to technical writing, and **Git-related assignments** as labeled in Canvas.

5.2 Attendance and participation

Participation matters. You are responsible for making up missed material.

More than three unexcused absences may result in a **failing grade** for the course.

5.3 Incomplete grades

Incompletes are **only** considered for prolonged illness or family emergencies that remove you from campus for an extended period late in the term.

They are **not** granted for falling behind due to motivation, misunderstanding, or time management alone. If you are worried, come talk early.

5.4 Regrading

Email a **written petition before the last class period**. Explain why a regrade is warranted with references to course standards. Decisions after review are **final**.

5.5 Integrity and classroom conduct

Cheating and plagiarism undermine capstone credibility; penalties range from **assignment failure** to **course failure**.

Constructive behaviors build trust; disruptive behaviors (including unauthorized recording) interfere with learning and may be addressed under university policies.

5.6 Time on task and access needs

Expect roughly **8 to 12 hours** of out-of-class work most weeks for a **four-hour weekly meeting** (more when deadlines cluster).

Contact **Accessible Education Services** if you need accommodations; talk to the instructor early if course design creates barriers.

6 Part 5: Semester schedule snapshot

6.1 Weeks 1 to 7 (topics abbreviated)

Week	Date	Block 1 (6:00 to 7:30 PM)	Block 2 (8:00 to 10:00 PM)	Deliverables due end of class unless noted
1	5/11	Syllabus workshop; Research vs. EDA	Project brainstorming	Project brainstorming survey
2	5/18	Technical writing I	Chartering explained; chartering working session	Technical writing output; **project charter**
3	5/25	Git for project work	Project working session	Weekly summary report
4	6/1	PD: alum panel	Project working session	Weekly summary; **project proposal**
5	6/8	Technical writing with Quarto	Data engineering consultations; working session	Technical writing output; weekly summary
6	6/15	PD: companies and networking	Project working session	Weekly summary
7	6/22	Statistics consultations	Project working session	**Data summary**; weekly summary

Weekly topics may shift; confirm guest sessions on Canvas as the term evolves.

6.2 Weeks 8 to 14 (topics abbreviated)

Week	Date	Block 1 (6:00 to 7:30 PM)	Block 2 (8:00 to 10:00 PM)	Deliverables due end of class unless noted
8	6/29	PD: behavioral interview prep	Project working session	Weekly summary
9	7/6	Machine learning consultations	Project working session	Weekly summary

Week	Date	Block 1 (6:00 to 7:30 PM)	Block 2 (8:00 to 10:00 PM)	Deliverables due end of class unless noted
10	7/13	PD: mock interviews I	Project working session	Weekly summary; **poster rough draft**
11	7/20	PD: internal mock interviews (Portland)	PD continued	Weekly summary
12	7/27	Peer feedback working session	Project working session	Weekly summary; **write-up rough draft**
13	8/3	Presentation prep	Peer practice; working session	Weekly summary
14	8/10	Poster presentations (Salem)	Poster presentations (Salem)	**Final write-up due 8/17**

6.3 Practical expectations (carry everywhere)

- Keep **Canvas deadlines** and **README cadence** aligned; surprises should show up on the board first.
- Treat meta-project peers as a **standing review panel**, not extra teammates.
- Make integration explicit across **engineering, modeling, visualization, ethics, and communication** so the project cannot be read as a thin dashboard or a notebook-only exercise.

7 References

7.1 Sources

1. DATA 510 syllabus (Canvas; local mirror: course syllabus HTML).
2. Capstone methodology companion page: project methodology.