Data Skills Pathway Student Expectations Guide

For students enrolled in ATSC 494 (Data Skills Pathway)

Aligned with the Undergraduate Expectations Guide

1) What is the Data Skills Pathway?

The Data Skills Pathway is a structured, step-by-step experience that builds practical data skills using real instrument and/or model datasets. The pathway focuses on learning how to work with real data challenges (missing values, noise, uncertainty, sensor issues), and how to produce results that are reproducible and trustworthy. Completing the pathway is strongly recommended before a paid internship because it builds the core habits expected in professional research work: planning tasks, managing time, documenting steps/results, and communicating progress using evidence (plots, tables, saved outputs). Students who complete the pathway typically start faster and work more independently.

2) Program Structure and What Happens in Each Stage

The pathway is embedded in a 15-week, credit-bearing course (ATSC 494) and is organized into four stages.

Stage 1 (Weeks 1–2): Orientation

Students learn why data skills matter in research and industry, what “real-world data” looks like, and why documentation and quality thinking are required. This stage prepares students for the expectations of paid research work, where outputs are used later by the team and must be reliable and traceable.

Stage 2 (Weeks 3–4): Programming and Tools Workshop

Students learn the foundations for reproducible data handling: opening files, running basic scripts/notebooks, making plots, and accessing shared data resources. This aligns with the first-week internship requirement to be able to access resources, locate data, and run the basic tools needed for the work.

Stage 3 (Weeks 5–10): Data Collection, Documentation, and Guided Analysis

Students practice working with real datasets: acquiring data, documenting sources, checking quality, cleaning/organizing, computing simple statistics, and creating interpretable plots (time series, scatter plots, composites). Students learn to justify decisions (filters, thresholds, assumptions). These habits match internship expectations to follow project workflows, keep work organized, and produce outputs others can understand without guessing.

Stage 4 (Weeks 11–15): Capstone Mini-project and Presentations

Students complete a focused mini-project and document steps so another student can reproduce the workflow. Students submit a brief report and give a concise oral or poster presentation. This directly mirrors typical internship deliverables such as scripts/notebooks, QC plots, validation plots with notes, organized datasets with a README, written summaries, and end-of-term presentations/posters.

3) Core Expectations for Every Pathway Student

The pathway is designed to mirror professional research work and the standards described in the Undergraduate Expectations Guide.

- ***Consistent Participation and Steady Weekly Progress***

Make steady progress each week. Real data work takes time to inspect, clean, and understand before analysis is meaningful. This matches the expectation to “make steady progress each week between check-ins” and take ownership of tasks.

- ***Professional Communication***

Communicate early and clearly when stuck. Use a professional approach: summarize the problem, list what you tried, and share evidence (error messages, logs, plots, screenshots). This follows the internship standard for troubleshooting first and communicating early with evidence so the supervisor can help efficiently.

- ***Meeting and Check-in***

When check-ins occur, provide a short, evidence-based progress update:

- One completed item you can show,
- One blocker/question + what you tried,
- Your plan for next week + expected completion dates.

4) Documentation Requirements

Documentation is required so that work is reproducible, reviewable, and trustworthy. Document as you go (short weekly/daily entries), not at the end. The Undergraduate Expectations Guide defines documentation as a core scientific practice and specifies that work must be traceable, reproducible, and easy to review. Minimum documentation for each dataset and mini-project (full sentences) includes:

- Data source + time range
- Data preparation steps (missing values, outliers, unit conversions)
- Analysis choices (variables + justification)
- Outputs (paths/links to plots, tables, scripts, folders)
- Results + quality checks (how you verified outputs)
- Next steps/open questions

This list matches the internship documentation expectations: tasks/dates, methods, files/paths, results/checks, and next steps.

Recommended format: The usual format is the Atmospheric Science wiki pages, with dated entries, short headings, and links to outputs. Confirm the best documentation approach for your specific project with your supervisor/instructor early.

The guide explicitly states the wiki-page format and the expectation to align with supervisor guidance.

5) Data Quality Expectations

Datasets often have gaps, outliers, inconsistent values, and instrument artifacts.
Students are expected to:

- identify issues early,
- describe them clearly,
- make reasonable cleaning decisions, and
- document what was done and why.

6) Integrity, Ethics, and Responsible Sharing

Ethical behavior is required. Do not fabricate results, alter data dishonestly, plagiarize, or share project data/code/results/ideas outside the team without approval.

The Undergraduate Expectations Guide clearly states: be honest with data/results, give proper credit, and do not share datasets/code/outputs/draft results/ideas outside the team without approval.

7) Backups and File Safety

Maintain backups and protect research files. Do not keep the only copy on a personal computer, USB drive, or personal cloud storage. Use approved shared storage.

This is a direct requirement in the Undergraduate Expectations Guide for file safety and team access.

8) Required Deliverables

By the end of the pathway, students submit:

- a brief written mini-project report, and
- a concise oral or poster presentation.

These align with common internship deliverables, including written summaries and end-of-term presentations/posters used to brief the team.

9) How Performance is Evaluated During The Data Skills Pathway ?

Students are evaluated on:

- Reliability,
- Communication,
- Documentation,
- Skill growth, and
- Contribution to the project.

10) Pathway Connection to Paid Opportunities

The pathway is designed as preparation for paid research roles. Students who complete the pathway typically start internships faster and work more independently because they already practice the expected habits.

End-of-training check (True/False)

1. T/F: Consistent weekly progress is expected; waiting until the end of the semester usually leads to weaker results and documentation.

2. T/F: If your schedule changes, you should notify your supervisor/instructor as soon as you know, not after you fall behind.

3. T/F: You should block Data Skills Pathway work time on your calendar each week to protect steady progress.

4. T/F: Documentation can be done at the end of the semester because the results matter more than the process.

5. T/F: If you are stuck, you should communicate early and include evidence (error message, log, screenshot, plot) to get help quickly.