Department of Atmospheric and Earth Science

AI Use Guidelines for Thesis, Dissertation, and Research Work

Addendum to UAH Graduate School AI Guidelines

1. Authority and Purpose

The UAH Graduate School AI Guidelines state that certain uses of generative AI are considered misuse *"unless expressly allowed in college or department/program AI guidelines."* This document exercises that authority on behalf of the Department of Atmospheric and Earth Science (AES).

Computational atmospheric science research routinely involves writing software to collect, process, analyze, and visualize data. AI-assisted coding tools are now standard in this workflow, just as compilers, debuggers, and IDEs have been before them. This addendum establishes department-specific guidelines that protect students engaged in legitimate computational research while maintaining the academic integrity standards the Graduate School's policy is designed to uphold.

2. Scope

These guidelines apply to all AES graduate students conducting thesis, dissertation, or departmentally-supervised research in any form (e.g., written, oral). They do not govern individual course assignments; individual faculty retain full authority to set AI use policies for their own courses.

3. Definitions

This document distinguishes between the following:

Term	Definition for Purposes of This Policy
Generative AI / LLM	Large language models and similar tools that generate text, code, or images from natural-language prompts (e.g., ChatGPT, Claude, Copilot, Gemini). This is what the Graduate School policy addresses.
Traditional AI/ML Methods	Machine learning and statistical methods used as research tools within atmospheric science: random forests, neural networks for satellite retrievals, EOF/PCA analysis, statistical post-processing (MOS), deep learning weather models (GraphCast, Pangu-Weather), ensemble calibration. These are not "generative AI" and are not restricted by these guidelines or by the Graduate School policy.
AI-Assisted Coding	Using a generative AI tool to help write, debug, or refactor code that the student then reviews, tests, validates, and takes responsibility for. The student directs the work; the AI assists in execution.

4. Permitted Uses of Generative AI in Research

In addition to the uses already permitted by the Graduate School (editing, proofreading, formatting, generating illustrations), the AES Department expressly permits the following uses of generative AI in thesis, dissertation, and research work:

4.1 Computational Work

- Writing, debugging, and refactoring code for data collection, processing, analysis, and visualization
- Generating scripts for data access (e.g., API calls, web scraping of public datasets, file format conversion)
- Developing plotting and visualization routines
- Translating code between languages (e.g., MATLAB to Python, Fortran to Python)
- Learning new programming concepts, libraries, or frameworks through AI-assisted explanation and example generation

4.2 Research Support

- Brainstorming research approaches and identifying potential methodologies
- Summarizing or explaining technical concepts to support learning
- Drafting and revising manuscript text, provided the intellectual content and scientific arguments originate with the student
- Checking equations, derivations, or mathematical formulations

5. Required Conditions for Permitted Use

All permitted uses above are subject to the following conditions. These are not optional. A student who uses AI without meeting these conditions is not protected by this addendum and may be subject to academic misconduct violations.

5.1 Advisor Approval

The student must have a conversation with their thesis/dissertation advisor about their intended use of generative AI **before** that use begins. The advisor may impose additional restrictions or requirements beyond those in this document. In these cases, the requirements must be documented prior to use.

5.2 Transparency and Disclosure

All use of generative AI must be disclosed. At minimum:

- Theses and dissertations must include a statement identifying what generative AI tools were used and for what purpose
- The disclosure should be specific (e.g., “Claude Code was used to assist in writing Python scripts for GOES-16 data retrieval and preprocessing”), not generic
- Generative AI tools may not be listed as authors

5.3 Validation and Responsibility

The student bears full responsibility for all work products, whether AI-assisted or not. Specifically:

- All AI-generated code must be reviewed, tested, and validated by the student before use in research
- The student must be able to explain and defend any code or analysis used in their research. If you cannot explain what your code does and why, you are not ready to defend it in your thesis or dissertation, regardless of whether AI generated it.
- Errors in AI-generated output that appear in submitted work are the student's errors
- Scientific claims, interpretations, or conclusions must be independently verified against primary sources

6. Data Security Requirements

The following categories of data must **never** be entered into any public generative AI tool (ChatGPT, Claude, Gemini, or similar), regardless of the purpose:

1. **Export-controlled data** under ITAR or EAR regulations
2. **Embargoed or pre-release data** from NASA missions, NOAA programs, or other federal agencies
3. **Proprietary or private instrument data or calibration information** not yet publicly released
4. **Controlled Unclassified Information (CUI)**
5. **Unpublished research data** that could compromise intellectual property, patentability, or competitive advantage
6. **Content from proposals or reviews**, consistent with prohibition on using AI tools in the review process by common funding agencies and journals
7. **Human subjects data** governed by IRB protocols or FERPA protections
8. Restricted data, defined in UAH Policy 06.01.01.

Students that are unclear about any of these data categories should consult their advisor about whether enterprise-grade AI tools with appropriate data handling agreements are available for their project. When in doubt, do not upload the data.

7. Student Protections

7.2 Intellectual Property

Students may not be required to submit their research work to third-party AI tools or AI detection services that claim intellectual property rights over submitted content, that store submitted content without the student's informed consent, or that could compromise the student's ability to publish or patent their work.

7.3 Safe Harbor for Self-Disclosure

A student who realizes they have used generative AI in a manner inconsistent with this policy and who self-discloses to their advisor **before** the affected work is evaluated or graded will receive an educational resolution (e.g., revise and resubmit, additional documentation requirements) rather than formal disciplinary action. This safe harbor is intended to encourage transparency over concealment and applies once per student. Repeated violations after the first self-disclosure are subject to standard academic integrity procedures.

8. Recommended Disclosure Language

Students may adapt the following template for their thesis, dissertation, or manuscript. This statement should go into the Methods or Acknowledgement section.

> *"Generative AI ([tool name]) was used to [specific task, e.g., "assist in developing Python scripts for GOES-16 Level 2 data retrieval and quality-control filtering"]. All AI-generated code was reviewed, tested, and validated by the author. The author accepts full responsibility for the accuracy and integrity of all work presented herein."*

9. What Remains Prohibited

This addendum does not override all restrictions in the Graduate School policy. The following non-exhaustive list remain prohibited:

1. **Submitting AI-generated text as your own writing** without substantial revision and intellectual contribution by the student. AI may assist in drafting and revision; it may not replace the student as the author of the scientific narrative.
2. **Using AI to generate scientific conclusions or interpretations** that the student then presents as their own analysis. The intellectual work of interpreting results is a core learning outcome of graduate education.
3. **Using AI-generated code without understanding or validation.** Accepting AI output and running it without reviewing, testing, and being able to explain it is not "direct involvement."
4. **Using AI to fabricate data, results, or citations.** This constitutes research misconduct under federal definitions, independent of any AI policy.
5. **Using AI-generated images in publications** in a manner inconsistent with publisher requirements. Nature/Springer, Elsevier, and AMS all restrict or prohibit AI-generated images. Students preparing work for publication must follow the target journal's policy.
6. **Undisclosed use of generative AI.** Any use that is not disclosed per Section 5.2 is a violation of this policy.
7. **Uploading restricted data to AI tools** as specified in Section 6.

Failure to follow department/program AI guidelines will be treated as an academic integrity violation and is subject to the UAH Academic Misconduct Policy. A student's failure to disclose the acceptable use of generative AI to their supervisory committee will also be treated as an academic integrity violation. Consequences may include actions up to and including dismissal from the program. In cases where the student is unsure, contact your research advisor.