Course Change Request

New Course Proposal

Date Submitted: 03/17/26 4:15 pm

Viewing: NEUR 560 : AI Supported Scientific Data Exploration and Discovery

Last edit: 03/17/26 4:15 pm

Changes proposed by: gscott21

In Workflow

1. **NEUR Chair**
2. **SC Curriculum Committee**
3. SC Assistant Dean
4. Assoc Provost-Graduate
5. Registrar-Courses
6. Banner

Approval Path

1. 03/18/26 10:56 am Saleet Jafri (sjafri): Approved for NEUR Chair

Are you completing this form on someone else's behalf?

Yes

Requestor:

Name	Extension	Email
Frank Krueger	3-4334	fkrueger@gmu.edu

Effective Term: Spring 2027

Subject Code: NEUR - Neuroscience

Course Number: 560

Bundled Courses:

Is this course replacing another course? No

Equivalent Courses:

Catalog Title: AI Supported Scientific Data Exploration and Discovery

Banner Title: AI in Scientific Data/Discvry

Will section titles vary by semester? No

Credits: 3

Schedule Type: Lecture

Hours of Lecture or Seminar per week: 3

Repeatable: May only be taken once for credit, limited to 2 attempts (N2)

Max Allowable Credits: 3

Default Grade Mode: Undergraduate Regular

Recommended Prerequisite(s):

Graduate standing or permission of instructor. Advanced undergraduate students with demonstrated interest in scientific research and data-driven inquiry may be admitted with permission.

Recommended Corequisite(s):

Required Prerequisite(s) / Corequisite(s) (Updates only):

Registrar's Office Use Only - Required Prerequisite(s)/Corequisite(s):

And/Or	(	Course/Test Code	Min Grade/Score	Academic Level	)	Concurrency?

Registration Restrictions (Updates only):

Registrar's Office Use Only - Registration Restrictions:

Field(s) of Study:

Class(es):

Level(s):

Degree(s):

School(s):

Catalog Description:

This course examines how modern AI systems—including generative AI and emerging AI agents—are transforming the way scientists explore, analyze, and interpret complex datasets. Rather than focusing on the development of machine learning models, the course emphasizes how researchers can use AI systems

to support scientific data exploration workflows, including data understanding, pattern discovery, visualization, interpretation, and communication of insights. Scientific research increasingly relies on complex datasets from behavioral, biological, neuroscience, and textual sources. At the same time, there is a shift in scientific practice: researchers increasingly collaborate with AI systems that assist with data exploration and insight generation rather than implementing algorithms from scratch. This course prepares students for this shift by introducing AI as a research partner in scientific discovery.

Justification:

What: This proposal introduces a new course focused on AI-supported scientific data exploration and analysis, complementing existing and proposed courses on AI applications and AI-supported research workflows.

Why: Scientific research is increasingly driven by large and complex datasets across disciplines such as biology, neuroscience, psychology, and environmental science. While existing courses in the College of Science focus on machine learning, data mining, and algorithm development, they typically emphasize coding and model construction.

In contrast, this course reflects an emerging shift in scientific practice: researchers increasingly use AI systems as collaborators to explore data, generate insights, and support decision-making without necessarily implementing algorithms from scratch.

This course therefore addresses a critical gap in the curriculum by focusing on AI-supported data exploration workflows rather than model development. Students learn how to interact with data using AI tools, identify patterns, visualize results, and interpret findings in a scientifically rigorous manner.

The course is clearly differentiated from existing offerings in that it: (i) does not focus on machine learning or algorithm implementation; (ii) does not duplicate data science or programming courses; and (iii) focuses on AI-assisted exploration, interpretation, and insight generation

Overall, this course aligns with current developments in AI-supported scientific discovery and prepares students for modern research environments where AI systems play a central role in data analysis.

Does this course cover material which crosses into another department?	No

Learning Outcomes:

Students will be able to:

1. Critically evaluate the role of modern AI systems—including generative AI and emerging AI agents—in scientific data exploration contexts, including their benefits, limitations, and ethical implications.
2. Use AI-supported tools to explore and analyze complex scientific datasets across domains such as behavioral, biological, neuroscience, and textual data.
3. Apply AI-assisted methods to identify patterns, generate insights, and support data interpretation using visualization and computational tools.
4. Design AI-supported data exploration workflows that integrate data understanding, analysis, visualization, and interpretation while improving efficiency, transparency, and reproducibility.
5. Communicate data-driven insights using AI-supported methods, including visualizations, structured summaries, and scientific presentations.
6. Reflect on the ethical, methodological, and societal implications of AI-supported data analysis, including issues of bias, interpretation, and responsible use.

Will this course be scheduled as a cross-level cross listed section? No

Attach Syllabus

AI & Data Exploration – Syllabus - Krueger - IPN.pdf

Additional Attachments

Staffing:

Frank Krueger, SSB & IPN

Relationship to Existing Programs:

N/A

Relationship to Existing Courses:

N/A

Have you reached out to the Libraries to determine whether there are adequate resources to support your course? If not, please email Meg Meiman, Associate University Librarian for Learning, Research, and Engagement at mmeiman2@gmu.edu.

No

Additional Comments:

Reviewer Comments

Key: 19285

Syllabus

AI-Supported Scientific Data Exploration and Discovery

BIOL-691 | NEUR-560 | BINF-739

Spring Semester 2027

Course Organization

Weekly schedule: Each week runs from Monday (12:01 am) to Sunday (11:59 pm EST), starting January 18, 2027

Instructor: Frank Krueger, Ph.D.

Department: School of Systems Biology

Phone: 703-993-4358

E-mail: fkrueger@gmu.edu (preferred)

Office Hours: Announcements, the Canvas calendar, and optional Zoom office hours work together to support planning, clarification, and connection throughout the semester.

Course Description

This asynchronous online course examines how modern AI systems, including generative AI and emerging AI agents, are transforming the way scientists explore, analyze, and interpret complex datasets. Rather than focusing on the development of machine learning models, the course emphasizes how researchers can use AI systems to support scientific data exploration workflows, including data understanding, pattern discovery, visualization, interpretation, and communication of insights.

Scientific research increasingly relies on complex datasets from behavioral, biological, neuroscience, and textual sources. At the same time, there is a shift in scientific practice: researchers increasingly collaborate with AI systems that assist with data exploration and insight generation rather than implementing algorithms from scratch. This course prepares students for this shift by introducing AI as a research partner in scientific discovery.

The course is organized in four progressive phases that reflect modern research workflows: (1) *Data Exploration & Understanding*, (2) *AI-Assisted Analysis*, (3) *Visualization & Interpretation*, and (4) *Workflow Integration*. Through these phases, students develop a structured approach to working with data using AI-supported methods.

Through interactive readings, weekly mini-projects, tool-based assignments, and ethical discussions focused on data use, interpretation, and responsible AI practices, students gain hands-on experience with AI-supported data exploration tools such as ChatGPT (with data analysis capabilities), Julius AI, computational notebook environments (e.g., Jupyter or Google Colab with AI assistance), and data visualization tools such as Tableau. These tools are used to explore datasets, generate insights, and build reproducible workflows.

The course emphasizes technological fluency and ethical literacy, guiding students to apply AI effectively, responsibly, and with scientific rigor. By the end of the course, students will be equipped to critically evaluate and integrate AI systems into their data exploration workflows.

The course does not focus on building AI models, but on using AI systems as collaborators in scientific data exploration and analysis.

This course is intentionally designed using inclusive STEM teaching principles to support diverse learners in an asynchronous environment. It treats responsible AI use as both a technical and pedagogical responsibility, supporting critical thinking, ethical reasoning, and sustained engagement with complex scientific data.

Learning outcomes

By the end of this course, students will be able to:

1. **Critically evaluate the role of modern AI systems—including generative AI and emerging AI agents—in scientific data exploration contexts**, including their benefits, limitations, and ethical implications.
2. **Use AI-supported tools to explore and analyze complex scientific datasets**, including behavioral, biological, neuroscience, and textual data.
3. **Apply AI-assisted methods to identify patterns, generate insights, and support data interpretation**, using visualization and computational tools.
4. **Design AI-supported data exploration workflows** that integrate data understanding, analysis, visualization, and communication, while improving efficiency, transparency, and reproducibility.
5. **Communicate data-driven insights using AI-supported methods**, including visualizations, structured summaries, and scientific presentations, while maintaining standards of scientific rigor and integrity.
6. **Reflect on the broader ethical, methodological, and societal implications of AI-supported data analysis**, including issues of bias, interpretation, and responsible use.

Across these outcomes, students will develop not only technical fluency with AI systems but also the judgment, reflection, and ethical reasoning necessary to use such tools responsibly in scientific and professional contexts.

AI & Data Exploration (created by ChatGPT 5.2)

Prerequisite

Graduate standing or permission of the instructor. Advanced undergraduate students with demonstrated interest in scientific research and data-driven inquiry may be admitted with permission.

This course is designed for students interested in the rapidly evolving role of artificial intelligence in scientific data exploration and analysis. Major components include engagement with current literature, development of AI-supported data exploration workflows, application of AI tools to analyze and visualize datasets, and participation in collaborative discussions on ethical and methodological issues in AI-supported science.

Textbook & Course Materials

Required Text, Recommended Texts, and Other Readings

- Readings will be made available on Canvas (See Learning Modules).

Course readings and examples are intentionally selected to reflect a range of scholarly perspectives, including contributions from early-career researchers, interdisciplinary scholars, and authors from diverse backgrounds. Materials include both foundational and current research on artificial intelligence in scientific practice, with a focus on how modern AI systems are used in data exploration, analysis, visualization, and interpretation of scientific datasets. AI is not a value-neutral technology, and exposure to multiple intellectual traditions strengthens critical thinking, ethical reasoning, and scientific rigor. Students are also encouraged to identify and share relevant scholarly sources that extend or challenge the perspectives represented in the course, provided they meet academic standards of quality, rigor, and relevance.

Course Logistics

This course will use a distance learning format; the primary meeting space will be on Canvas; and we will use other means of keeping in touch, such as e-mail, telephone, and Zoom. This is a rigorous course: you will accomplish the following activities in a typical week:

- Reading about 35-50 pages, reflecting on the content, and discussing the material with your classmates,
- Completing online activities and responding to weekly requirements, and
- Working on assignments, completing in Canvas according to the assignment schedule.

Although the delivery method differs, it should take you the same amount of time as a typical full-semester course. You should expect to spend **approximately 9 hours on coursework each week** (including the time you would have spent in a classroom). It is critical to keep up with weekly requirements. Each week, I will provide announcements via e-mail and a module in our Canvas course to specify required activities and assignments (available by clicking on ‘Modules' on the course menu in Canvas).

Weekly announcements are used intentionally to scaffold learning across the week: early-week announcements provide orientation and relevance (often linking to current AI news or newsletters), midweek reminders support deeper engagement with course readings and optional book chapters, and end-of-week announcements offer reflective extensions, such as films or broader cultural examples related to the topic.

The weekly structure of this course is intentionally scaffolded to support learning in an asynchronous environment. Activities such as glossary work, discussions, AI-supported data exploration tasks, and mini-projects are sequenced to build understanding progressively, allowing students to develop skills in data exploration and interpretation before applying them in more integrative workflow-based assignments.

Canvas (Available on January 18, 2027)

We will use Canvas for the course. Additional guidance on individual assignments and discussion questions will be posted there. Please visit our Canvas site regularly.

Access Canvas by following these steps:

1. Go to http://mymason.gmu.edu.
2. Log in using your NETID and password.
3. Click on the 'Dashboard' tab.
4. Click on '**AI-Supported Scientific Data Exploration and Discovery**."

Deadlines and Late Submissions

All assignments will be submitted through Canvas for grading. Deadlines in this course are intended to structure learning and support timely feedback, not to serve as punitive cutoffs. Students are encouraged to submit work by the posted due dates whenever possible.

Late submissions are permitted. However, after the due date, assignments may no longer be visible for submission in Canvas. In such cases, students must contact the instructor to request re-activation of the assignment and briefly explain the reason for the delay.

There is no automatic grade penalty for late submissions. Final grades reflect the quality and completeness of submitted work. Missing work is not graded automatically and remains ungraded until submitted or addressed directly with the instructor.

This approach is designed to balance academic rigor with flexibility, recognizing that students may be managing complex schedules, responsibilities, or unexpected challenges while engaging in a demanding STEM course.

Instructor-Student Communication

I will respond to your e-mails from Monday (9 am) through Friday (6 pm) within 24 hours. If I am away from e-mail for more than two days, I will send an announcement to the class.

Before sending an e-mail with questions, please check the following (available on your Canvas course menu) **unless the e-mail is of a personal nature**:

1. Syllabus.
2. Tutorials on how to use Canvas features.
3. Canvas Q&A (resources specific to Mason).
4. Technology Requirements.

Mason E-MAIL

- Mason requires that the Mason e-mail be used for all courses. I will be sending messages to your Mason e-mail address, and you are responsible for ensuring you have access to them.

- You may forward your Mason e-mail to other accounts, but always use your Mason e-mail when communicating with me to verify your identity.
- You must regularly check your Mason e-mail account and keep your mailbox maintained so that messages are not rejected for being over quota.
- When you e-mail me, you can expect a response within 24 hours (*Monday through Friday*). If I am going to be away from e-mail for more than two days, I will send an announcement to the class.
- When you e-mail me, be sure to include '**AI & Data Exploration'** at the beginning of the subject heading to alert me that I have received a message from one of my online students.

Participation

Netiquette For Online Discussions

Our discussion should be collaborative, not combative; you create a learning environment, share information, and learn from one another. Respectful communication is essential to your success in this course and as a professional. Please re-read your responses carefully before you post them so others will not take them out of context or as personal attacks. Be positive to others and diplomatic with your words, and I will try my best to do the same. Be careful when using sarcasm and humor. Without face-to-face communication, your joke may be viewed as criticism. Experience shows that even an innocent remark in the online environment can be easily misconstrued.

Netiquette prepared by Charlene Douglas, Associate Professor, College of Health & Human Services, GMU.

In Week 1, students will participate in a structured activity to co-create a small set of operational agreements for respectful dialogue and collaboration. These agreements—developed collectively and revisited as needed—will guide discussion and interaction throughout the semester. Respectful engagement is treated as an academic skill that supports ethical reasoning, perspective-taking, and productive disagreement.

Participation in this asynchronous course is defined as meaningful academic engagement rather than constant visibility. Students may demonstrate participation through discussion posts, reflective writing, project work, and thoughtful interaction with course materials and peers. Evaluation emphasizes the quality of reasoning and engagement, not communication style or frequency alone.

Technology Requirements

Technology requirements for the course are:

- Internet connection (DSL, LAN, or cable connection desirable).
- Supported web browser (e.g., Chrome, Edge, Safari, or Firefox) for Canvas and optional live sessions.
- MS Office 365 ProPlus is provided at no cost via the Microsoft Student Advantage Program (Access is tied to your @gmu.edu e-mail address).

Student Responsibilities

Mason E-mail

Students are responsible for the content of university communications sent to their George Mason University e-mail account and are required to activate their account and check it regularly. For accessibility and privacy, the university, school, and program will send communications to students solely through their Mason e-mail account —students should respond accordingly.

Patriot Pass

Once you sign up for your Patriot Pass, your passwords will be synchronized, and you will use your Patriot Pass username and password to log in to the following systems: Canvas, University Libraries, Mason E-Mail, myMason, Patriot Web, Virtual Computing Lab, and WEMS. [See]

AI Guidelines

These resources provide a framework and guidance for the responsible and ethical use of AI across our academic community. [See]

Students with Disabilities

Students with disabilities who seek accommodations in a course must register with the George Mason University Office of Disability Services (ODS) and inform their instructor in writing at the beginning of the semester. [See]

Academic Integrity

Students must be responsible for their work, and students and faculty must take on the responsibility of dealing explicitly with violations. The tenet must be the foundation of our university culture. [See]

Honor Code and Virtual Classroom Conduct

Students must adhere to the guidelines of the George Mason University Honor Code. [See]

University Policies

Students must follow university policies (See).

Responsible Use of Computing

Students must follow university policies. [See]

University Calendar

Details regarding the current Academic Calendar [See].

University Catalog

The current university catalog [See].

Student Services

Writing Center

The George Mason University Writing Center staff provides various resources and services (e.g., tutoring, workshops, writing guides, handbooks) intended to support students as they work to construct and share knowledge through writing. ESL Help: The program was designed specifically for students whose first language is not English who feel they might benefit from additional, targeted support throughout the semester [See].

University Libraries

University Libraries provide resources for distance students [See].

Counseling and Psychological Services

The George Mason University Counseling and Psychological Services (CAPS) staff consists of professional counselors, clinical psychologists, social workers, and counselors who offer a wide range of services (e.g., individual and group counseling, workshops, and outreach programs) to enhance students' personal experience and academic performance [See].

Students experiencing challenges related to mental health, food security, housing stability, or other basic needs are strongly encouraged to make use of these services. Seeking support is a responsible and proactive step, and doing so will not negatively affect your standing in the course.

Family Educational Rights and Privacy Act (FERPA)

The Family Educational Rights and Privacy Act of 1974 (FERPA), or the 'Buckley Amendment,' is a federal law that protects students' educational records and provides students with certain rights. [See].

Weekly Schedule

Distance learning courses are dynamic—to ensure we achieve our learning outcomes, we may need to negotiate changes to the weekly schedule. We will focus on learning, fairness, and reason for any approved changes. Each week's activities—reading assignments on topics, watching videos, defining key concepts (via a glossary), sharing and discussing your knowledge with classmates (via the discussion forum), and completing assignments to build the AI toolbox—require approximately 9 hours.

The course emphasizes hands-on application of AI systems within scientific data exploration workflows rather than theoretical model development.

Note that this course has no final exam. Instead, students complete a final project in which they design and implement an AI-supported scientific data exploration workflow, integrating dataset exploration, analysis, visualization, interpretation, and communication of insights using the AI tools and systems introduced throughout the course. The project emphasizes the use of AI systems as collaborative tools in scientific inquiry rather than the implementation of machine learning models.

The table below lists the weekly schedule, significant activities, significant assignments, points, and due dates for this course. Final grades will be based on the total points earned in the class.

The course structure emphasizes continuous engagement and reflection rather than high-stakes testing, supporting sustained learning and multiple pathways for students to demonstrate mastery of course outcomes. Submission deadlines and late submission procedures are described in the *Deadlines and Late Submissions* section above.

Week	Major Topics and Methods	Assignments	Points	Due Dates (11:59 pm EST)
Phase 1 — Data Exploration & Understanding				
Week 1 Mon Jan 18	**Topic**: Data vs Knowledge — Understanding Scientific Data and AI-Supported Exploration **AI Ethics**: Data Responsibility, Bias, and Trust in AI-Assisted Interpretation **Tool**: ChatGPT (Data Analysis Mode) — AI Data Explorer	Orientation Quiz Self-Introduction Glossary (Topic) Ethics Discussion (Part 1) Ethics Discussion (Part 2) Dataset Reflection & Exploration Brief (Project)	10 15 10 10 10 20	Sun Jan 24 Sun Jan 24 Thu Jan 21 Thu Jan 21 Sun Jan 24 Sun Jan 24
Week 2 Mon Jan 25	**Topic**: Structure vs Meaning — Interpreting Data Structures and Representations **AI Ethics**: Reliability vs Misinterpretation in AI-Supported Analysis **Tool:** Julius AI / Notebook Environment — AI-Assisted Data Exploration	Glossary (Topic) Ethics Discussion (Part 1) Ethics Discussion (Part 2) Dataset Mapping & Description (Project)	10 10 10 20	Thu Jan 28 Thu Jan 28 Sun Jan 31 Sun Jan 31
Week 3 Mon Feb 1	**Topic**: Text vs Evidence — Scientific Literature as Data and Source of Insight **AI Ethics**: Bias and Framing in Scientific Data and Text Analysis **Tool**: NotebookLM / ChatGPT — AI-Assisted Text Interpretation	Glossary (Topic) Ethics Discussion (Part 1) Ethics Discussion (Part 2) Literature Dataset Exploration (Project)	10 10 10 20	Thu Feb 4 Thu Feb 4 Sun Feb 7 Sun Feb 7
Week 4 Mon Feb 8	**Topic**: Observation vs Interpretation — Behavioral Data and Experimental Meaning **AI Ethics**: Interpreting Human Data Responsibly **Tool**: ChatGPT / Julius AI — Behavioral Data Analysis	Glossary (Topic) Ethics Discussion (Part 1) Ethics Discussion (Part 2) Behavioral Data Insight Report (Project)	10 10 10 20	Thu Feb 11 Thu Feb 11 Sun Feb 14 Sun Feb 14
Week 5 Mon Feb 15	**Topic**: Signal vs Noise — Understanding Biological Data and Variability **AI Ethics**: Overinterpretation and Data Reliability **Tool**: Julius AI / Python Notebook — Biological Data Exploration	Glossary (Topic) Ethics Discussion (Part 1) Ethics Discussion (Part 2) Biological Data Analysis Brief (Project)	10 10 10 20	Thu Feb 18 Thu Feb 18 Sun Feb 21 Sun Feb 21
Week 6 Mon Feb 22	**Topic**: Measurement vs Reality — Interpreting Neuroscience and Time-Series Data **AI Ethics**: Privacy and Interpretation of Neural Data **Tool**: Jupyter + AI Assistant — Time-Series Exploration	Glossary (Topic) Ethics Discussion (Part 1) Ethics Discussion (Part 2) Neural Data Visualization (Project)	10 10 10 20	Thu Feb 25 Thu Feb 25 Sun Feb 28 Sun Feb 28

Phase 2 — AI-Assisted Analysis				
Week 7 Mon Mar 1	**Topic**: Automation vs Understanding — AI-Assisted Coding and Analysis **AI Ethics**: Dependence on AI vs Scientific Understanding **Tool:** Jupyter / Copilot — AI-Assisted Coding	Glossary (Topic) Ethics Discussion (Part 1) Ethics Discussion (Part 2) AI-Assisted Analysis Script (Project)	10 10 10 20	Thu Mar 4 Thu Mar 4 Sun Mar 7 Sun Mar 7
Spring Break	—	—	—	Mar 8 – Mar 14
Week 8 Mon Mar 15	**Topic**: Pattern vs Illusion — Discovering Meaningful Patterns in Data **AI Ethics**: False Patterns and Overfitting Interpretation **Tool**: Julius AI — Pattern Detection	Glossary (Topic) Ethics Discussion (Part 1) Ethics Discussion (Part 2) Pattern Discovery Report (Project)	10 10 10 20	Thu Mar 18 Thu Mar 18 Sun Mar 21 Sun Mar 21
Week 9 Mon Mar 22	**Topic**: Integration vs Inconsistency — Combining Multiple Data Sources **AI Ethics**: Data Compatibility and Misuse **Tool**: AI Data Integration Tools	Glossary (Topic) Ethics Discussion (Part 1) Ethics Discussion (Part 2) Cross-Dataset Analysis (Project)	10 10 10 20	Thu Mar 25 Thu Mar 25 Sun Mar 28 Sun Mar 28
Phase 3 — Visualization & Interpretation				
Week 10 Mon Mar 29	**Topic**: Visualization vs Distortion — Representing Scientific Data Accurately **AI Ethics**: Misleading Visualizations **Tool**: Tableau / AI Visualization Tools	Glossary (Topic) Ethics Discussion (Part 1) Ethics Discussion (Part 2) Visualization Portfolio (Project)	10 10 10 20	Thu Apr 1 Thu Apr 1 Sun Apr 4 Sun Apr 4
Week 11 Mon Apr 5	**Topic**: Bias vs Objectivity — Interpreting Results with AI **AI Ethics**: Bias in AI-Supported Analysis **Tool**: ChatGPT / AI Interpretation Systems	Glossary (Topic) Ethics Discussion (Part 1) Ethics Discussion (Part 2) Critical Interpretation Essay (Project)	10 10 10 20	Thu Apr 8 Thu Apr 8 Sun Apr 11 Sun Apr 11
Week 12 Mon Apr 12	**Topic**: Communication vs Manipulation — Presenting Scientific Data **AI Ethics**: Responsible Communication of Results **Tool**: AI Presentation Tools	Glossary (Topic) Ethics Discussion (Part 1) Ethics Discussion (Part 2) Data Communication Presentation (Project)	10 10 10 20	Thu Apr 15 Thu Apr 15 Sun Apr 18 Sun Apr 18
Phase 4 — Workflow Integration				
Week 13 Mon Apr 19	**Topic**: Reproducibility vs Flexibility — Designing Reliable Workflows **AI Ethics**: Transparency and Scientific Responsibility **Tool**: Integrated AI Systems	Glossary (Topic) Ethics Discussion (Part 1) Ethics Discussion (Part 2) Workflow Design Draft (Project)	10 10 10 20	Thu Apr 22 Thu Apr 22 Sun Apr 25 Sun Apr 25

Week 14 Mon Apr 26	**Topic:** Human vs AI Discovery — Future of Scientific Exploration **AI Ethics:** Human Judgment vs AI Decision-Making **Tool:** AI Agents	Glossary (Topic) Ethics Discussion (Part 1) Ethics Discussion (Part 2) Final Proposal (Project)	10 10 10 20	Thu Apr 29 Thu Apr 29 Sun May 2 Sun May 2
Phase 5 — Final Integration				
Exam Week Mon May 3	**Final Project**	Final AI-Supported Data Workflow Project Tool Mastery Bonus (optional) Final Reflection Portfolio (optional)	85 15 20	Sun May 9
Total			**850**	—

Grading Scale (points)

Final grades for this course will be based on the percentage of total points earned, calculated from a core total of **800 points**. In addition to the required weekly assignments, students may earn up to **50 extra points** through optional activities. These include a *Tool Mastery Badge (15 points), a Final Reflection Portfolio (20 points)*, and submission of the *GMU course evaluation (15 points)*. While not required, these bonus opportunities can help improve a student's final grade, compensate for missed work, or contribute to a higher-grade bracket. Final grades are determined based on the 800-point core, with any additional points applied on top. As a result, earning above 100% is possible and is intended to recognize students who go beyond the core requirements. These activities are designed to encourage deeper engagement with the course, including reflection on AI-supported data exploration workflows, development of practical skills, and thoughtful participation in the learning process.

Letter Grade	Percentage	Points	Performance
A^+	98–100%	784–800 (800+ with extra credit)	Superb work
A	93–97%	744–783	Excellent work
A^-	90–92%	720–743	Nearly excellent work
B^+	87–89%	696–719	Very good work
B	83–86%	664–695	Good work
B^-	80–82%	640–663	Mostly good work
N/A	<80%	<640	Failing work