MAT 135: Final Project Guidelines and Grading Guide

Overview

The final project for this course is the creation of a comprehensive final paper that includes the following main components:

- Introduction
- Strand 1: Historical Significance
- Strand 2: Mathematics
- Strand 3: Real-World Applications
- Conclusion

The project is divided into **five milestones**, which will be submitted at various points throughout the course to scaffold learning and ensure quality final submissions. These milestones will be submitted in **Modules Two, Three, Four, Five, and Seven.**

Outcomes

To successfully complete this project, you will be expected to apply what you have learned in this course and should include several of the following course outcomes:

1. Communicate and problem solve in mathematics, without the constraints of formal mathematical notation

2. Demonstrate knowledge in fundamental areas of higher mathematics, including number theory, infinity, geometry, topology, fractals, and other topics

3. Experiment with viewing the world from a mathematical perspective

Main Elements

Students will select and research one of the following topics (students may also propose their own topic) and submit this for instructor approval.

MAT 135 Final Project Topic List

- Logic
- Mathematical Puzzles
- Irrational Numbers
- Prime Numbers
- Number Theory

- Fibonacci Sequence
- Numbers in Nature
- Euclidean Geometry
- Non-Euclidean Geometry
- Tessellations
- Mathematical Patterns
- Symmetry
- Infinity
- Fractals
- Knot Theory
- Graph Theory
- Linear Algebra
- Chaos Theory
- Self-Selected Topic

NOTE: Instructors will approve topics for which they know sufficient research and information exists for the student to complete the final paper. Students will research three areas of this topic and submit each "strand" for grading and feedback. The strands are as follows:

1. **Strand 1: The Historical Significance**: Students will research the historical development of the topic from inception through modern-day usages. Students may select the most significant developments and contributors to the topic.
2. **Strand 2: Mathematics**: Students will research and explain the mathematics of the topic chosen. This may include the most significant discovery, theory, or usage. Students will fully explain the mathematics of the topic.
3. **Strand 3: Real-World Applications**: Students will research and make connections between the topic and the usages in the real world. Students may make connections to other fields where appropriate.

Final Paper: Students will write an introduction to this paper, briefly outlining the topic and explaining the three strands. Students will include all three strands as subsections to the final paper, taking into account specific instructor feedback and suggestions for improvement. Given the nature of specific topics, students may need to consolidate repetitive sections to make a cohesive paper. Students will write a conclusion paragraph, which will be a reflective analysis of what the student gained from researching this topic. The final paper will include a cover sheet and reference page, using proper APA formatting. Total paper length: no less than 10 pages (exclusive of cover page and references).

The final paper should be submitted as one document with the following components:

- Cover Sheet
- Introduction
- Strand 1: Historical Significance
- Strand 2: Mathematics
- Strand 3: Real-World Applications
- Conclusion
- References

Format

Milestone One: *Topic Selection & Outline*
In **Task 2-2**, you will submit your chosen topic to the instructor for approval and an outline of the three strands of the paper, including potential references. The topic may come from the list provided above or it can be self-designed. **This milestone will be graded separately using the Final Project Topic Selection and Outline Rubric, and feedback will be provided for revisions to the final paper.**

Milestone Two: *Strand 1—Historical Significance*
In **Task 3-2**, you will submit the paper for Strand 1: Historical Significance. This strand should be between 2–3 pages and fully explain the history of the topic. Proper APA citations and references are expected. **This milestone will be graded separately using the Strand Paper Rubric, and feedback will be provided for revisions to the final paper.**

Milestone Three: *Strand 2—Mathematics*
In **Task 4-2**, you will submit the paper for Strand 2: Mathematics. This strand should be between 2–3 pages and fully explain the mathematics of the topic chosen. This may include the most significant theory, theorem, or finding. Proper APA citations and references are expected. **This milestone will be graded separately using the Strand Paper Rubric, and feedback will be provided for revisions to the final paper.**

Milestone Four: *Strand 3—Real-World Applications*
In **Task 5-2**, you will submit the paper for Strand 3: Real-World Applications. This strand should be between 2–3 pages and fully explain the real-world applications of the topic chosen. This may include common usages of the topic, applications, and/or connections to other fields. Proper APA citations and references are expected. **This milestone will be graded separately using the Strand Paper Rubric, and feedback will be provided for revisions to the final paper.**

Milestone Five: *Final Paper*
In **Task 7-2**, you will submit the final paper. Include an introduction outlining the topic and what the reader can expect within each of the three strands. This paper will then consist of the three strands of research that has been conducted over the course of the term. Finally, write a conclusion, which will be a reflective analysis of what you learned from the research you conducted. The final paper should be cohesive and polished and take into consideration feedback provided

by the instructor throughout the term. The paper should be no less than 10 pages, excluding the cover sheet and references page. Proper APA citations are expected. **This milestone will be graded using the Final Project Rubric.**

Deliverable Milestones

Milestone	Deliverables	Module Due	Grading
1	Topic Approval & Paper Outline	Two	Paper will be graded (50 points total) with Final Project Topic Selection and Outline Rubric —feedback will be provided
2	Strand 1—Historical Significance	Three	Paper will be graded (100 points total) with Strand Paper Rubric—feedback will be provided
3	Strand 2—Mathematics	Four	Paper will be graded (100 points total) with Strand Paper Rubric—feedback will be provided
4	Strand 3—Real-World Applications	Five	Paper will be graded (100 points total) with Strand Paper Rubric—feedback will be provided
5	Final Product: Final Paper	Seven	Graded separately; Final Project Rubric (200 points total)

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Final Project Rubric

Requirements of submission: Written components of projects must follow these formatting guidelines when applicable: double spacing, 12-point Times New Roman font, one-inch margins, and discipline-appropriate citations. Final paper should be no less than 10 pages, excluding coversheet and references page; proper APA formatting is expected.

Critical Elements	Exemplary (100%)	Proficient (85%)	Needs Improvement (55%)	Not Evident (0%)	Value
Communication	Demonstrates comprehensive communication of mathematical issues and ideas using accurate mathematical language and proper terminology	Demonstrates moderate communication of mathematical issues and ideas using accurate mathematical language and proper terminology	Demonstrates minimal communication of mathematical issues and ideas using accurate mathematical language and proper terminology	Does not demonstrate communication of mathematical issues and ideas using accurate mathematical language and proper terminology	20
Knowledge of Fundamental Areas	Demonstrates knowledge of multiple mathematical issues through extensive collection and in-depth analysis of evidence to make informed conclusions	Demonstrates knowledge of some mathematical issues through collection and in-depth analysis of evidence to make informed conclusions	Demonstrates minimal knowledge of mathematical issues through collection and analysis of evidence to make informed conclusions	Does not demonstrate knowledge of mathematical issues through collection and analysis of evidence and does not make informed conclusions	20
Integration and Application	All of the mathematical concepts are correctly applied and integrated with supporting evidence in a real-world context	Most of the mathematical concepts are correctly applied and integrated with supporting evidence in a real-world context	Some of the mathematical concepts are correctly applied and integrated with supporting evidence in a real-world context	Does not correctly apply or integrate mathematical concepts	20
Main Elements	Includes almost all of the main elements and requirements and cites multiple examples to illustrate each element	Includes most of the main elements and requirements and cites many examples to illustrate each element	Includes some of the main elements and requirements	Does not include any of the main elements and requirements	25
Writing (Mechanics/Citations)	Student meets all requirements for submission. No errors related to organization, grammar and style, and citations	Student meets most requirements for submission. Minor errors related to organization, grammar and style, and citations	Student meets some requirements for submission. Some errors related to organization, grammar and style, and citations	Student does not meet requirements for submission. Major errors related to organization, grammar and style, and citations	15
				Total	**100%**