



Senior Portfolio Instructions

Prior to graduation, all mathematics students must complete a senior portfolio, including the cover sheet. This portfolio consists of three parts and must be signed by the student's academic advisor.

Part I: A collection of four to six mathematics artifacts.

Actuarial Science Sequence: At least four items from the following list:

1. Graded statistical project from an actuarial or statistics course, such as MAT 353, or MAT 355, or from Statistical Project Competition.
2. Internship report submitted for MAT 298.
3. Substantial graded proof or mathematical argument in a class taken in the major, most likely MAT 175.
4. Graded test from an advanced actuarial class, e.g., MAT 380, MAT 381, MAT 383, or MAT 384.
5. Passing of two professional actuarial examinations.
6. Completion of the Katie School Business Communication workshop or, for students who have not had internship experience, a full Certificate in Leadership and Business Acumen.

Data Science and Computational Mathematics Sequence: At least four items from the following list:

1. Graded **mathematical proof** from courses such as MAT 175/236/247/347/260/363.
2. Graded project or test showing competence in **programming** from courses such as IT 166/168/180
3. Graded project or test showing competence with **databases or data structures** from courses such as IT 279
4. Graded project or test from an advanced **statistical class**, such as MAT 351/353/354/355/356/443/455.
5. Graded project or test showing competence in **predictive modeling, deep learning, or data visualization**, such as IT 244/348/352 or MAT 205.
6. Graded **data science** project from a data science/statistics course, such as MAT 355 or a Data Science Project Competition.
7. Graded project or test from an advanced optimization class such as MAT 362 or an advanced discrete mathematics class such as MAT 363.

Mathematics and Statistics Sequences: A collection of four to six mathematics artifacts. These problems with solutions can not all come from one course and are to demonstrate your ability to use the language of mathematics to communicate ideas, show how you can construct and critically analyze mathematical arguments, and demonstrate your ability to develop your problem-solving skills, logical reasoning, and creative thinking over a sequence of courses.

Suggested problems to include would be any project or extended problem given in courses numbered 175 or higher. You are encouraged to select problems from a series of related courses. For example, you might choose to include sample problems/solutions from a sequence of courses taken over the same mathematics subtopic, as given below.

Algebra: MAT 175, MAT 236, MAT 330, MAT 336, MAT 337

Analysis: MAT 247, MAT 340, MAT 341, MAT 345, MAT 347

Discrete Mathematics: MAT 260, MAT 361, MAT 362, MAT 363

Statistics: MAT 350, MAT 351, MAT 355, MAT 356,

Research: MAT 175, MAT 260, MAT 268

Note that it is not necessary to include problems from every course listed in a subtopic above, only a

subset of courses from a subtopic or subtopics. You are encouraged to submit several problems with solutions from two or more subtopics.

For each artifact, include a brief description of why this particular artifact was chosen and how it meets the criteria stated above. For example, how does this artifact demonstrate using the language of mathematics to communicate ideas? How does this artifact demonstrate your ability to analyze mathematical arguments critically? How does this artifact show how you have developed your problem-solving skills and/or creative thinking? It is not necessary that every artifact meet all the criteria suggested above, but each artifact should demonstrate at least one of these features. In addition, at least one artifact should address each of the criteria mentioned above.

Part II: Complete the Attitude Assessment Survey during your last semester. You will be sent a link to a survey during your last semester.

Part III: Submit your scores on external professional examinations, if applicable to your sequence (see the following cover sheet).

SENIOR PORTFOLIO COVER SHEET

Name _____ Advisor _____

UID _____ Graduation Term _____ Catalog _____

Major (s) _____ Graduation GPAs: Major _____

Minor (s) _____ Overall _____

Math Courses Completed: 200-level _____

(circle transfer courses) 300-level _____

Part I: List of artifacts submitted

Artifact #	Title	Course	Grade	Brief description of artifact.
1.				
2.				
3.				
4.				
5.				
6.				

Part II: Attitude Assessment Survey

Date Survey Completed Online: _____

Part III: Professional Examinations Scores (enter NA if not applicable)

Illinois Certification Testing Exam in Math: Score _____

Actuarial Professional Actuarial Examinations (if you have exams other than those listed, write them in):

SOA P/ CAS 1 Score _____ SOA FM/CAS 2 Score _____

SOA FAM Score _____ CAS MAS I Score _____

SOA ALTAM Score _____ CAS MAS II Score _____

SOA ASTAM Score _____ SOA SRM Score _____

GRE:

Verbal Reasoning Score _____

Quantitative Reasoning Score _____

Analytical Writing Score _____

GRE Mathematics Subject Test: Score _____

Comparable Professional Exam: _____ **Score** _____

Portfolio Evaluation Date _____

Advisor Signature _____

Department of Mathematics B.A./B.S. Portfolio Assessment Rubric

Primary Traits	Not Present	Developing	Established	Advanced	Goal
Demonstrates the ability to <u>construct and analyze mathematical arguments</u> (for example, a proof).		Shows evidence of <u>developing mathematical arguments and proofs</u> ; gives evidence of <u>using various methods of reasoning and proof</u> .	Shows evidence of <u>fully developed mathematical arguments and proofs</u> ; shows evidence of <u>recognizing reasoning and proof as fundamental aspects of mathematics</u> ; shows evidence of <u>selecting and using various methods of reasoning and proof</u> .	Shows evidence of <u>fully developed mathematical arguments and proofs that are elegant and creative</u> ; shows evidence of <u>recognizing reasoning and proof as fundamental aspects of mathematics</u> ; shows evidence of <u>selecting and using various methods of reasoning and proof in creative ways</u> ; shows evidence of <u>making and investigating mathematical conjectures</u> .	2
Demonstrates the ability to <u>solve mathematical problems</u> .		Shows evidence of <u>solving routine problems</u> ; provides evidence of <u>knowing</u> the process of mathematical problem solving.	Shows evidence of <u>applying a variety of strategies to solve mathematical problems</u> ; shows evidence of <u>more developed mathematical problem solving skills</u> .	Shows evidence of <u>applying and adapting a variety of strategies to solve mathematical problems utilizing logical reasoning and creative thinking</u> ; artifacts indicate that the student <u>can build mathematical knowledge through problem solving skills</u> .	3
Applies mathematical knowledge to <u>new problem situations</u> .		Shows evidence of <u>recognizing and solving new problem situations</u> .	Shows evidence of recognizing and solving new problems <u>in a variety of contexts</u> .	Shows evidence of recognizing and solving new problems <u>in a variety of contexts</u> ; shows evidence of <u>selecting, applying, and translating mathematical ideas to solve new problems</u> .	3
Uses <u>mathematical terms</u> (notation, symbolism) appropriately and correctly.		Shows evidence of using mathematical terms to <u>organize, record, and communicate mathematical ideas</u> .	Shows evidence of using mathematical terms to <u>organize, record, and communicate mathematical ideas</u> ; shows evidence of using mathematical terms to <u>model physical, social, or mathematical phenomenon</u> .	Shows evidence of using mathematical terms to <u>organize, record, and communicate mathematical ideas</u> ; shows evidence of using mathematical terms to <u>model and interpret physical, social, or mathematical phenomenon</u> ;	5
Demonstrates the ability to <u>communicate mathematics</u> .		Shows evidence of <u>using the language of mathematics in some appropriate ways</u> .	Shows evidence of <u>communicating his or her mathematical thinking clearly to others</u> ; shows evidence of <u>using the language of mathematics to express ideas precisely</u> .	Shows evidence of <u>communicating his or her mathematical thinking clearly to others</u> ; shows evidence of using the language of mathematics to <u>express ideas precisely</u> ; shows evidence of <u>organizing mathematical thinking through communication</u> .	5