Senior Assessment Graduation Requirements

In addition to completing all course and university requirements, candidates for a B.A. or B.S. in Mathematics, Applied Mathematics, and Mathematics with Teacher Licensure must successfully pass the following two assessments as part of the graduation requirement for candidacy: (1) The **Senior Portfolio** and (2) the **Exit Interview**. This document gives guidelines and policies related to both items.

Senior Portfolio Guidelines

Purpose:
The senior portfolio is a **combination of narrative and evidence**, produced by the candidate, that together **argue the candidate's mastery** of the theory and applications of mathematics. The most important components of the portfolio consist of the candidate presenting arguments (called **Rationales**) to demonstrate their mastery. To support these arguments, the candidate includes and cites within their rationales suitably chosen artifacts (called **Products**). The products will either come directly from coursework or arise from an approved capstone experience.

Content:
The portfolio will include a Cover Sheet, a signed Honor Code Statement, a Table of Contents, and five discipline-specific sections (Introduction, Concept Reflections, Core, Concentration, Capstone), with each Section being separated by a divider.

Here is a checklist and detailed discussion of each piece of the portfolio.

1. Cover Page
    a. The cover page must be the first page of the portfolio and must include the candidate's name, degree, major, and concentration if appropriate (see part (c) below).
    b. If the degree is B.S., specify the major as either Mathematics, Mathematics with Teacher Licensure, or Applied Mathematics.
    c. If the degree is B.A., specify the major as Mathematics and the concentration as either Pure, Applied, or Teacher Licensure.
2. Signed Honor Code Statement
    a. The second page of the portfolio must include the following Honor Code Statement:

Portfolio Honor Code Statement

"On my honor, I certify that this portfolio upholds the four values of Elon University -- honesty, integrity, responsibility, respect -- as cited in Elon's Honor Code <http://www.elon.edu/e-web/students/handbook/honor.xhtml>.

In assembling this portfolio, I have refrained from lying, cheating, plagiarizing, and facilitating others in these actions.

I understand that any violation of the Honor Code may result in receiving a failing grade on my portfolio. Further, I understand that egregious violations of the Honor Code may result in disciplinary suspension or permanent separation from Elon University."

b. The Honor Code Statement **must be signed and dated** by the candidate.

3. Table of Contents
4. Section One Divider with title "**Introductory Section**"
5. Introductory Section's contents.
    a. **Cover Letter or Graduate School Personal Statement.** This letter, addressed to a prospective employer or graduate school, must follow professional conventions in both form and content. **This should not be a letter written for an internship.**
    b. **Resume.** The resume should be professionally composed, providing the prospective employer/program with all details necessary to be considered a competitive applicant.
    c. **Annotated List of Courses.** The annotated list of courses should include paragraph descriptions, written in the candidate's own words, of all mathematics courses taken to satisfy the major requirements.
6. Section Two Divider with title "**Concept Reflection Section**"
7. Concept Reflection Section's contents.
   Candidates will write a total of **three (3) concept reflections**, each a minimum of **two (2) paragraphs** in length. The concepts must be chosen from the following courses:
    a. One from a Calculus course
    b. One from either Linear Algebra or Applied Matrix Theory
    c. One from either Mathematical Reasoning or Discrete Structures

   Each concept should constitute a **significant theorem, definition, or algorithm** that is of **fundamental importance** in the mathematics discipline. In each reflection, the

candidate must give a **thorough** and **mathematically-correct** exposition of the concept. They must also **argue** how the concept plays a **fundamental** role in mathematics.

8. Section Three Divider with title "**Core Section**"
9. Core Section's contents.
    a. **Rationale.** The Core Section rationale must be at least **two (2) pages** in length and must present **a strong argument** of how the candidate has **achieved mastery** in **content knowledge** and in **problem solving ability** in the following three (3) areas:
        i. Calculus
        ii. Linear Algebra or Applied Matrix Theory
        iii. Mathematical Reasoning or Discrete Structures.

    To support their argument, candidates must include and cite within the rationale three (3) products from their coursework; one each from items (i), (ii), and (iii) above. In the rationale, candidates must clearly identify *where* and *how* each **included product demonstrates mastery**. The rationale should also discuss how the candidate's core coursework is related, if at all, to their future plans.

    b. **Products.** The three (3) products will be of the candidate's own choosing; they do not have to include instructor grades or comments. While dates are not required on products, the **course in which the product was created MUST be identified by catalog number** on the product.
10. Section Four Divider with title "Concentration Section"
11. Concentration Section's contents.
    a. **Rationale.** The Concentration Section rationale must be at least **one (1) page** in length and must present a **strong argument** of how the candidate has achieved **mastery in problem solving ability** and in **constructing mathematical arguments**. To support their argument, candidates must include and cite within the rationale one product from their coursework, depending on the concentration:
        i. For pure or teacher licensure concentrations, the product must be a mathematical proof the candidate has written. The proof must not come from a Core course.
        ii. For applied candidates, the product must be a mathematical model the candidate has generated. The model must highlight a mathematical argument made in a course different from the Core courses (allied field courses are acceptable).

    In the rationale, candidates must clearly identify *where* and *how* the included product demonstrates mastery, with attention given to discussing the **problem solving process** and the **construction of mathematical arguments**. The rationale should also discuss how the candidate's concentration coursework is related, if at all, to their future plans.

b. **Product.** The product should come from a course directly related to the candidate's concentration area, as specified in items (i) and (ii) above; it does not have to include instructor grades or comments. While the date is not required on the product, the **course in which the product was created MUST be identified by catalog number** on the product.

12. Section Five Divider with title "**Capstone Section**"
13. Capstone Section's contents.
    a. **Rationale.** The Capstone Section rationale must be at least **one (1) page** in length. It must present both a **detailed description** of the capstone experience and a **strong argument** of how the candidate has achieved mastery in the following three areas: (1) **application of knowledge**, (2) **communication of knowledge**, (3) **independent thinking**. To support their argument, candidates must include and cite within the rationale one capstone product. Acceptable capstone products include:
        i. Final Research Paper/Slides
        ii. Final Internship Paper/Slides
        iii. For teaching licensure candidates, Unit Plan from Methods (focusing on math content knowledge)

        In the rationale, candidates must clearly identify *where* and *how* the included capstone product demonstrates mastery of items (1), (2) , and (3) above. The rationale should also discuss how the candidate's capstone experience is related, if at all, to their future plans.
    b. **Product.** The product must correspond to the capstone experience of the candidate's chosen concentration area. For example, teaching licensure students must include item (iii). Other concentrations will use item (i) if they conducted research (either through Seminar or Independent Study) or item (ii) if they completed an internship.

Sources of Help:

After candidates have read and absorbed the contents of this Portfolio Guidelines document, they may have further questions. In such cases, candidates are encouraged to consult one or more of the following resources:

- **COE 310 course (Highly Recommended)**. This 1-hour cooperative education course is usually offered in the fall and provides (among other things) help and support for producing a complete portfolio.
- **The Portfolio Coordinator**. This person can answer specific questions related to portfolio policies. If a candidate asks a question that is already answered in the Portfolio Guidelines, the Coordinator will refer the student to this document.

- **The Candidate's Advisor**.

Submission Policies:
Portfolios must be submitted to the Portfolio Coordinator in the following two formats:

1. **Electronically**, as one PDF file. Candidates should email the PDF file to the Portfolio Coordinator.
2. **In hard copy**, compiled into a black, 1.5-inch, clear view binder. **The candidate's name and major must be identified on the front cover and side spine.** Candidates must use sheet protectors for their documents; no more than 2 pages placed back to back in each protector.

The deadline for submitting the portfolio depends on the semester in which the candidate intends to graduate:

- The due date is **February 15** for those graduating at the end of the **May or Summer** semesters.
- The due date is **October 1** for those graduating at the end of the **Fall or Winter** semesters.
- If the portfolio due date falls on a weekend, the due date moves to the following Monday.

Evaluation:
Portfolios will be assessed independently by two faculty reviewers from Elon or another university. Each reviewer reads the candidate's portfolio very carefully and issues either a pass or fail on each portion. The reviewers give their evaluations to the Portfolio Coordinator who will then notify candidates of the results of their portfolio evaluation no later than one month after the due date. The possible outcomes of the portfolio evaluation are as follows:

- **The candidate passes the portfolio**. This means both reviewers issued a pass on each portion of the candidate's portfolio.
- **The candidate needs to submit revisions**. This means at least one reviewer has issued a fail on at least one portion of the portfolio.
    - If a reviewer issues a fail on a portion of the portfolio, the candidate will be required to revise and resubmit that portion of the portfolio.
    - Each fail will be accompanied by comments from the reviewer. The candidate **must address all comments** in their revision.
    - The Portfolio Coordinator will send the candidate an email listing all required revisions and their corresponding reviewer comments. This email will also contain the due date for submitting revisions.

    - To submit revisions, the candidate will send **one email** to the Portfolio Coordinator. This email should contain a separate PDF file for each item that requires revisions as well as a PDF file of the entire revised portfolio.
    - If revisions are not received by the due date, the candidate will receive a fail on the entire portfolio and will not be able to graduate with a mathematics major.
- Once revisions are received, the reviewers will assess all revised documents one final time. The reviewers give their evaluations to the Portfolio Coordinator, who will then notify the candidate on the outcome of their revisions. The possible outcomes are:
    - **The candidate passes the revisions** and therefore receives a pass on the portfolio.
    - **The candidate fails the revisions**. This means the candidate will receive a fail on the entire portfolio and will not be able to graduate with a mathematics major.

Portfolio Scoring Sheet:
The following is a copy of the document reviewers will use to evaluate each candidate's portfolio.

Portfolio Scoring Sheet

Instructions:
Rate each section with a P (pass) or F (fail). For each F issued, add detailed comments and recommendations in the Comments section. These comments should be written directly to the candidate with the express purpose of aiding them in the revision process. Note, candidates must earn a passing rating on each item from each evaluator in order to pass the portfolio.

Honor Code Statement
- The Honor Code Statement is included, signed, and dated. **P/F**

Section One – Introductory Section
- **Cover Letter.** The Cover Letter is professional and appropriate. **P/F**
- **Resume.** The Resume is professional and appropriate. **P/F**
- **Annotated List of Courses.** The List of Courses is complete and annotated. **P/F**

Section One Comments.

Section Two – Concept Reflection Section

Each reflection should: (1) concern a significant concept; (2) give a thorough and correct exposition of that concept; and (3) argue why the concept is of fundamental importance.

- **Concept Reflection on Calculus** **P/F**
- **Concept Reflection on Linear Algebra/Matrix Theory** **P/F**
- **Concept Reflection on Reasoning/Discrete** **P/F**

Section Two Comments.

Section Three - Core Section

- **Rationale.** **P/F**
  - Presents a strong argument on achieving mastery in content knowledge and in problem solving ability in Calculus, Linear Algebra/Matrix Theory, and Reasoning/Discrete.
  - Cites one product from each of the Core areas.
  - Clearly and persuasively indicates where and how each product demonstrates mastery.
- **Products.** **P/F**
  - Includes an appropriate product from Calculus.
  - Includes an appropriate product from LinAlg/MatrixThy.
  - Includes an appropriate product from Reasoning/Discrete.

Section Three Comments.

Section Four – Concentration Section

- **Rationale.** **P/F**
  - Presents a strong argument on achieving mastery in problem solving ability and in constructing mathematical arguments.
  - Cites one product from their coursework, depending on the concentration:
    - For pure or teacher licensure concentrations, the product must be a mathematical proof (not from a Core course).
    - For applied candidates, the product must be a mathematical model (not from a Core course, but allied field courses are acceptable).
  - Clearly and persuasively indicates where and how the product demonstrates mastery, with attention given to discussing the problem solving process and the construction of mathematical arguments.
- **Product.** **P/F**
  - Includes either a proof (for pure/licensure) or a model (for applied).

Section Four Comments.

Section Five – Capstone Section

- **Rationale.** **P/F**
    - Presents a detailed description of the capstone experience.
    - Presents a strong argument on achieving mastery in: (1) application of knowledge; (2) communication of knowledge; and (3) independent thinking.
    - Cites an acceptable capstone product: Research/Internship paper or Unit Plan for licensure candidates.
    - Clearly and persuasively indicates where and how product demonstrates mastery of items (1), (2) , and (3) above.
- **Product.** **P/F**
    - Includes the appropriate capstone product: Research/Internship paper or Unit Plan (for licensure students).

Section Five Comments.

Exit Interview Guidelines

Once a candidate has passed the portfolio evaluation process, they will be contacted by the Portfolio Coordinator to set up their Exit Interview. The purpose of the Exit Interview is to judge the candidate's ability to discuss and interpret factual material concerning mathematics and its applications. The Interview will be administered by at least two faculty from Elon's Department of Mathematics and Statistics and will be graded on a Pass/Fail scale. Candidates will be informed of their interviewers' names and must contact them immediately to set up their Interview. All Exit Interviews must be scheduled within two weeks of being notified of their interviewers' names.

Interview Format

- Exit interviews will be approximately 30 minutes in length.
- Candidates will be asked to discuss the mathematics reported in **any** of the products that were included in their portfolio.
- Candidates will be asked to orally explain mathematical ideas, methods or results as if speaking to a **non-mathematical audience**.
- Candidates will NOT be informed of the product choices before the interview so should familiarize themselves with all their submitted products.
- After candidates pass the Interview, the Portfolio Coordinator will email candidates a link to the Senior Survey, in which they rate their confidence in the skills related to the

program learning objectives and offer feedback on the math major, teaching effectiveness, advising and course offerings.