**Assessment Plan**

**BA Mathematical Sciences**
**Department of Mathematics**
**College of Natural, Applied and Health Sciences**
**Kean University**

**Mission:**

The Mathematical Sciences Program at Kean University has several related goals that are aligned with the university mission. The mission of the Department of Mathematics is teaching, research and other scholarly activities in the discipline, and providing quality education to our students. The Department strives for excellence in teaching its major and service courses, ensuring they are stimulating and informative. The Mathematics Department performs many different roles in fulfilling its mission to discover and communicate mathematical knowledge.

**Assessment Process:**

As part of the requirements for the BA in Mathematical Sciences, students in all four options (Mathematical Sciences, Mathematical Sciences Teacher Certification, Mathematical Sciences Certification for Teachers of Students with Disabilities, and Mathematical Sciences Statistics Option) take the following common core courses: the full calculus sequence, linear algebra, and probability and statistics. These core courses provide a sound backbone for the discipline with regard to the practical and theoretical aspects of mathematics. As such, these core courses, as well as our capstone course, are the primary vehicles for assessing the core knowledge of mathematics of our students.

Each course has assessment tools such as exams, research, reflective writing assignments, portfolio work, group work projects, etc., as part of the evaluation process. The program has used results of assessment for making improvements to program practices aimed at increasing student learning. For example, because the department collects data for NCATE in a number of our courses, we are constantly reevaluating the content of the courses and how they are taught.

The culminating assignment of Math 4890, Senior Seminar, the capstone course for all our majors, has been identified as one of the direct measures for assessing attainment of our program Student Learning Outcomes. In this course, assessment data is collected from a final project that requires students to provide the evidence of meeting program goals. There is also a content exit exam for all students as a further direct measure of Student Learning Outcomes. Each semester, composite data from scored student projects and exit exams are collected and analyzed to address areas of program strengths and weaknesses and to inform decisions leading to program improvements. In addition, a systematic process for gathering data utilizing an indirect measure, the Graduating Student Survey, was established. Data from the student survey will also help inform our decisions regarding program improvement. All of the above measures assess our students as they exit the major; entrance assessment of our students takes place in Math 2415, Calculus 1. Comparing the SLO data we obtain from both beginning and graduating students will be invaluable to the department as we strive to improve the program.

**Student Learning Outcomes (SLOs) and Direct/Indirect Measures:**
Students who graduate with a BA in Mathematical Sciences should be able to:

**SLO1:** Use mathematics as a problem solving tool. (KU 1, 2; GE K1, S3, S4, V3)

Direct Measure: Final research project in MATH 4890 scored with rubric aligned with SLOs
Direct Measure: Comprehensive Content Assessment
Direct Measure: Calculus 1 common final exam questions
Indirect Measure**:** Graduating Student Survey

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**SLO2**: Recognize connections between various topics in mathematics. (KU 1, 4; GE S4)

Direct Measure: Final research project in MATH 4890 scored with rubric aligned with SLOs
Direct Measure: Comprehensive Content Assessment
Direct Measure: Calculus 1 common final exam questions
Indirect Measure: Graduating Student Survey

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**SLO3**: Demonstrate the ability to write and understand mathematical argument. (KU 1,4; GE S1, S4)

Direct Measure: Final research project in MATH 4890 scored with rubric aligned with SLOs
Direct Measure: Comprehensive Content Assessment
Direct Measure: Calculus 1 common final exam questions
Indirect Measure: Graduating Student Survey

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**SLO4**: Effectively communicate mathematics via written word, formal presentation, and informal dialogue. (GE S1, S2, V4)

Direct Measure: Final research project in MATH 4890 scored with rubric aligned with SLOs
Direct Measure: Oral presentation given in MATH 4890 scored with GE rubric
Direct Measure: Comprehensive Content Assessment
Direct Measure: Calculus 1 common final exam questions
Indirect Measure: Graduating Student Survey

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**SLO5**: Use technology to explore and demonstrate mathematical ideas. (KU 2, 4; GE S5)

Direct Measure: Final research project in MATH 4890 scored with rubric aligned with SLOs
Direct Measure: Comprehensive Content Assessment
Direct Measure: Calculus 1 common final exam questions
Indirect Measure: Graduating Student Survey

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**SLO6**: Do research in their selected program option. (KU 1, 3, 4; GE K1, S1, S3, V5)

(Note: this is a capstone-specific SLO.)

Direct Measure: Final research project in MATH 4890 scored with rubric aligned with SLOs
Indirect Measure: Graduating Student Survey

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## Kean University Student Learning Outcomes:

(KU 1) Think critically, creatively and globally
(KU 2) Adapt to changing social, economic, and technological environments.
(KU 3) Serve as active and contributing members of their communities.
(KU 4) Advance their knowledge in the traditional disciplines and enhance their skills in professional areas.

## General Education Student Learning Outcomes

### *Student Learning Outcomes – Knowledge*

***Students will demonstrate proficiency in knowledge and content by:***

1) applying the scientific method to understand natural concepts and processes (GEK1)
2) evaluating major theories and concepts in social sciences (GEK2)
3) relating literature to historical context (GEK3)
4) evaluating major theories and concepts in the fine arts (GEK4)

### *Student Learning Outcomes – Skills*

***Students will demonstrate the skills and technology necessary to:***

1) write to communicate and clarify learning (GES1)
2) communicate effectively through speech (GES2)
3) solve problems using quantitative reasoning (GES3)
4) think critically about concepts in multiple disciplines (GES4)
5) demonstrate information literacy (GES5)

### *Student Learning Outcomes – Values*

***Students will exhibit a set of values that demonstrates:***

1) personal responsibility (GEV1)
2) ethical and social responsibility (GEV2)
3) social and civic engagement (GEV3)
4) respect for diverse cultures and perspectives (GEV4)
5) life-long learning (GEV5)