ADVANCED OUTCOMES IN THE MAJOR AREA

DISCIPLINE: MATHEMATICS (GENERAL)

Discipline Outcomes	Advanced Level Abilities	
	Primary Focus	**Related Focus**
1. Reads, writes, listens, and speaks mathematics effectively. ▪ She understands and independently uses mathematical language and representations with fluency in order to communicate to varied audiences at appropriate levels. ▪ She creates mathematical representations in order to express mathematical structure of problem contexts and to solve mathematical problems. ▪ She translates among various mathematical representations.	Analysis, 5 Analysis, 6 Communication, 5 Communication, 6	Problem Solving, 5 Problem Solving, 6
2. **Uses the language, frameworks, and processes of mathematics effectively.** ▪ She applies knowledge of mathematical problems and problem solving strategies with confidence and creativity. ▪ She understands, uses, and adapts mathematical processes with efficiency. ▪ She understands, uses, and adapts computational tools to assist in effective problem solving. ▪ She has built and uses an integrated knowledge of mathematical frameworks, including conceptual understanding, procedural skill, and the ability to use the expressive power of various mathematical representations. These frameworks include: the mathematics of continuous functions, algebra, geometry, statistics, discrete mathematics, and the historical development of mathematics.	Analysis, 5 Analysis, 6 Problem Solving, 5 Problem Solving, 6	Communication, 5 Communication, 6
3. Formulates and solves diverse mathematical problems and interprets results. ▪ She integrates knowledge of mathematical and general problem solving approaches to design effective problem solving strategies. ▪ She formulates problems effectively based on mathematical knowledge. ▪ She chooses appropriate computational tools and uses them efficiently and effectively.	Analysis, 5 Analysis, 6 Communication, 5 Communication, 6 Problem Solving, 5 Problem Solving, 6	
4. Uses mathematical abstraction. ▪ She observes and expresses patterns, and creates generalizations. ▪ She understands generalizations, and expresses concrete examples. ▪ She appreciates the power of abstraction, and the necessity of proof. ▪ She reads mathematical proofs with understanding and insight. ▪ She creates mathematical proofs.	Analysis, 5 Analysis, 6 Communication, 5 Communication, 6	Problem Solving, 5 Problem Solving, 6

Advanced Level Courses required for the Major (taken collectively this set of courses in various combinations contributes to the achievement of the outcomes of the major):

Required

MT 383 internship

Choose at least 4 of the following:

- MT 340 History of Mathematics
- MT 345 College Geometry
- MT 347 Modern Algebra
- MT 350 Differential Equations
- MT 420 Axiomatic Systems
- MT 460 Real Analysis
- MT 491 Mathematics Seminar

Advanced Ability Units Required for the Major:

4 units required

Choose L5 and/or L6 in two of the following:

- Analysis, 5
- Analysis, 6
- Communication, 5
- Communication, 6
- Problem Solving, 5
- Problem Solving, 6