MAJOR IN MATH - PURE MATHEMATICS CONCENTRATION

Requirements

Mathematics Major Requirements

All Mathematics majors must take the following required courses.

Code	Title	Units
Required Courses		
MATH 265	ELEMENTARY LINEAR ALGEBRA	4
MATH 267	INTRODUCTION TO ABSTRACT MATHEMATICS	4
MATH 273	CALCULUS I	4
MATH 274	CALCULUS II	4
MATH 275	CALCULUS III	4
Total Units		**20**

Pure Mathematics Concentration Requirements

In addition to the 20 units of common requirements for all Mathematics majors, the Pure Mathematics concentration requires 46 units for a total of 66 units. All courses must be completed with a grade equivalent of 2.00 or higher. MATH 490 and minimum six additional upper-level courses in the major must be taken at Towson University.

Code	Title	Units
Required Courses		
COSC 236	INTRODUCTION TO COMPUTER SCIENCE I [1]	4
MATH 331	PROBABILITY	4
MATH 369	INTRODUCTION TO ABSTRACT ALGEBRA	4
MATH 372	REAL ANALYSIS I	4
MATH 463	LINEAR ALGEBRA	3
MATH 467	ALGEBRAIC STRUCTURES	3
MATH 472	REAL ANALYSIS II	3
MATH 475	COMPLEX ANALYSIS	3
MATH 490	SENIOR SEMINAR IN MATHEMATICS [2]	3
Electives		
Select five upper-level Mathematics (MATH) courses		15
Select at least two of the following:		
MATH 315	APPLIED COMBINATORICS	
MATH 332	MATHEMATICAL STATISTICS	
MATH 353	EUCLIDEAN AND NON-EUCLIDEAN GEOMETRIES	
MATH 374	DIFFERENTIAL EQUATIONS	
MATH 377	MATHEMATICAL MODELS	
or MATH 439	COMPUTATIONAL PROBABILITY MODELS	
MATH 379	FOURIER ANALYSIS WITH APPLICATIONS	
Select at least two of the following:		
MATH 451	GRAPH THEORY	
MATH 457	DIFFERENTIAL GEOMETRY	
MATH 465	NUMBER THEORY	
MATH 477	TOPOLOGY	
Total Units		**46**

1. COSC 175 is a prerequisite for COSC 236.
2. MATH 490 must be taken at Towson University.

Departmental Honors Program

The Department of Mathematics offers a departmental honors program for students who demonstrate exemplary abilities in mathematics. The program provides students with an opportunity to work closely with faculty mentors in an individual program of research, directed readings and independent study.

Graduation with departmental honors requires a minimum overall cumulative GPA of 3.33, and successful completion of a two-course research sequence and an honors thesis in mathematics (MATH 499). Departmental honors will be posted to the transcript shortly after the bachelor's degree is conferred.

Code	Title	Units
Required Coursework for Departmental Honors in Mathematics		
Research Sequence, Select one of the following:		6
MATH 491 & MATH 492	READINGS IN MATHEMATICS and RESEARCH IN MATHEMATICS	
MATH 493 & MATH 494	READINGS IN MATH EDUCATION and INDEPENDENT STUDY: RESEARCH IN MATHEMATICS EDUCATION	
MATH 495 & MATH 496	APPLIED MATHEMATICS LABORATORY I and APPLIED MATHEMATICS LABORATORY II	
Thesis Requirement		
MATH 499	HONORS THESIS IN MATHEMATICS	1
Total Units		**7**

Four-Year Plan of Study

Sample Four-Year Plan

The selected course sequence below is an example of the simplest path to degree completion. Based on course schedules, student needs, and student choice, individual plans may vary. Students should consult with their adviser to make the most appropriate elective choices and to ensure that they have completed the required number of units (120) to graduate.

Freshman

Term 1	Units	Term 2	Units
MATH 273 (Core 3)	4	COSC 236[1]	4
Core 1 (or Core 2)	3	MATH 265	4
Core 4	3	MATH 274	4
Core 5	3	Core 2 (or Core 1)	3
Elective	3		
	16		**15**

Sophomore

Term 1	Units	Term 2	Units
MATH 267	4	MATH 331	4
MATH 275	4	MATH Elective	
Core 6	3	Core 8 (Recommended: PHYS 242)	4

Core 7 (Recommended: PHYS 241)	4	Core 9	3
		Core 10	3
	15		**14**
Junior			
Term 1	**Units**	**Term 2**	**Units**
MATH 369	4	MATH 372	4
MATH Elective	3	MATH 463	3
Core 13	3	MATH Elective	3
Core 14	3	MATH Elective	3
Elective	3	Core 11	3
	16		**16**
Senior			
Term 1	**Units**	**Term 2**	**Units**
MATH 467	3	MATH 475	3
MATH 472	3	MATH 490	3
Core 12	3	MATH Elective	3
Elective	3	Elective	3
Elective	3	Elective	1
	15		**13**
Total Units 120			

[1] COSC 175 is a prerequisite for COSC 236.

Learning Outcomes

1. Demonstrate knowledge of the properties of numbers and sets.
2. Demonstrate skills and knowledge of appropriate technology used in solving mathematical problems.
3. Demonstrate skills and knowledge of the basic concepts of calculus.
4. Demonstrate skills and knowledge of linear and abstract algebra.
5. Demonstrate skills and knowledge of basic probability and/or statistics.