

PROPOSAL FOR AN AREA OF EMPHASIS

Date: November 5, 2025

School/College: Franklin College of Arts and Sciences_____

Department/Division: Mathematics_____

Program (Major and Degree): Mathematics, B.S.

Area of Emphasis Title: Theoretical Mathematics_____

CIP: 27010105_____

Which campus(es) will offer this program? Athens_____

Proposed Effective Term: Fall 2026

1. Area of Emphasis Description:

Provide a description of the area of emphasis, including the focus and objectives.

The Area of Emphasis in Theoretical Mathematics is a specialized, advanced track designed explicitly for well-prepared undergraduate mathematics majors who have ambitions to pursue graduate study in mathematics. It will provide a rigorous and comprehensive foundation in the core disciplines of pure mathematics (algebra, analysis, and geometry/topology), in addition to providing opportunities through elective courses for students to explore specialized topics and shape their mathematical interests. This will prepare students for the intellectual demands and research expectations of strong mathematics graduate programs, and position them to be competitive for admission to such programs.

2. Area of Emphasis Requirements:

Include prefixes, numbers, and titles of required courses, number of credit hours required, residency requirements (if any), and grade requirements (if any). Attach a list of requirements for the major which includes the new area of emphasis.

The requirements specific to the Area of Emphasis will be the following “Required Core Theoretical Mathematics Courses” and “Elective Theoretical Mathematics Courses.” This is in addition to the requirements applicable to all math majors (regardless of whether they are completing this or any other area of emphasis), reproduced subsequently.

Required Core Theoretical Mathematics Courses (15 credit hours):

- MATH 4000/6000 (Modern Algebra I)
- MATH 4010/6010 (Modern Algebra II)
- MATH 4100/6100 (Real Analysis I)
- MATH 4150/6150 (Complex Variables)
- MATH 4200/6200 (Point Set Topology) *or* MATH 4250/6250 (Differential Geometry)

Elective Theoretical Mathematics Courses (Minimum 6 credit hours):

Select two courses from among the following, not including any used to satisfy the previous requirement:

- MATH 4200/6200 (Point Set Topology)
- MATH 4250/6250 (Differential Geometry)
- MATH 4400 (Number Theory)
- MATH 4450 (Cryptography)
- MATH 4600 *or* STAT 4510 (Probability/Mathematical Statistics I)
- MATH 4700 (Qualitative ODEs)
- MATH 4720 (Partial Differential Equations)
- MATH 4670 (Combinatorics)
- MATH 4690 (Graph Theory)
- MATH 8000 (Algebra)
- MATH 8100 (Real Analysis I)
- MATH 8150 (Complex Analysis I)
- MATH 8200 (Algebraic Topology)

Requirements for all math majors:

Area VI Courses Related to the Major

MATH 2700

Choose 1 course(s) from the following:

MATH 2260

MATH 2310H

MATH 2410

Choose 1 course(s) from the following:

MATH 2270

MATH 2500

Note: This requirement can be waived by completion of MATH 3510

Choose 2 course(s) from the following:

CSCI 1301-1301L

CSCI 1302

CSCI 1360

CSCI 2670

CSCI 2720

PHYS 1211-1211L *

PHYS 1251 *

PHYS 1311-1311L *

PHYS 1212-1212L **

PHYS 1252 **

PHYS 1312-1312L **

PHYS prefix course (higher than *PHYS* 1312-1312L, excluding *PHYS* 1990)***

STAT 2360-2360L ^

STAT 4210 ^

*Only one of these courses can be taken to fulfill this requirement.

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^ Students pursuing the Area of Emphasis in Mathematics and Data Science should take STAT 2360-2360L and STAT 4210.

If the University requirement of 18 hours in Area VI is not satisfied after completing the above requirements, any other courses may be used to complete the 18 hours in Area VI. The Mathematics Department suggests courses in a foreign language or courses listed above. The Mathematics Department requires individual review of non-equivalent transfer courses before they can be used to satisfy Area VI and Major Requirements.

Required Courses (9-10 hours)

MATH 3100

MATH 3200 *

Choose 1 course(s) from the following:

MATH 3000

MATH 3300

MATH 3510

*Can be waived for students who complete MATH 3510

3. Approvals:



Department Head

Dean of School/College

Dean of Graduate School