

# CIS MATHEMATICS

Current CECS undergraduate students majoring in Computer and Information Science (CIS), Cybersecurity and Information Assurance (CIA), or Software Engineering (SE) may pursue a concurrent Bachelor of Science degree in CIS Mathematics. This makes it possible for CECS students to earn two degrees at the same time: a principal Bachelor of Science degree in CIS, CIA, or in SE and a separate concurrent Bachelor of Science degree in CIS Mathematics. Both degrees must be earned at the same time. The courses for the concurrent Bachelor of Science degree in CIS Mathematics cannot be used as elective credits for the principal degree, but must be taken in addition to the 120-123 credits required for the Bachelor of Science degree in CIS, the Bachelor of Science degree in CIA, or the Bachelor of Science degree in SE.

The educational objectives of the concurrent Bachelor of Science program in CIS Mathematics are to prepare graduates to:

1. Be able to develop innovative mathematical solutions to complex computational problems.
2. Engage in continuous learning to advance their professional careers.

## Dearborn Discovery Core (General Education)

All students must satisfy the University's Dearborn Discovery Core requirements ([https://catalog.umd.umich.edu/undergraduate/gen\\_ed\\_ddc/](https://catalog.umd.umich.edu/undergraduate/gen_ed_ddc/)), in addition to the requirements for the major

## Major Requirements

(Concurrent degree only)

The BS in CIS Mathematics degree requires a minimum of thirty credits in mathematics courses as follows:

Code	Title	Credit Hours
Fifteen credits of mathematics courses required for the BS degree in CIS, CIA or in SE:		
MATH 115	Calculus I	4
MATH 116	Calculus II	4
MATH 227	Introduction to Linear Algebra	3
CIS 275	Discrete Structures I	4
Seven credits from the following two courses:		
MATH 215	Calculus III	4
MATH 472	Introduction to Computational Mathematics	3
or MATH 395	Elementary Number Theory	
Select a minimum of 8-9 credits from the following courses: <sup>1,4</sup>		8-9
MATH 300	Math Lang Proof & Struct	
MATH 335	Mathematical Interest Theory	
MATH 390	Topics in Mathematics (Prior approval by CECS for use in CIS Math degree needed)	
MATH 395	Elementary Number Theory	
MATH 396	Introduction to Cryptography	
MATH 412	Introduction to Modern Algebra	
MATH 420	Stochastic Processes	
MATH 423	Applied Linear Algebra	
MATH 425	Statistical Inference	

MATH 435	Mathematics of Finance
MATH 451	Advanced Calculus
MATH 454	Fourier Series and Boundary Value Problems
MATH 455	Functions of a Complex Variable with Applications <sup>3</sup>
MATH 462	Mathematical Modeling
MATH 472	Introduction to Computational Mathematics
MATH 492	Introduction to Topology
<b>Total Credit Hours</b>	<b>30-31</b>

<sup>1</sup> 8 credit hours can only be fulfilled by taking two 3-credit hour classes from the approved list and two credit hours of topics/independent study in mathematics

<sup>2</sup> Credit for only one course from MATH 413, MATH 523

<sup>3</sup> Credit for only one course from MATH 455, MATH 555.

<sup>4</sup> Permission required to take a graduate course. Graduate tuition assessment applies.

The following CECS graduate courses may also be used towards the CIS Mathematics degree: CIS 451, CIS 515, CIS 551; ECE 555, ECE 560, ECE 567, ECE 580; IMSE 505, IMSE 510, IMSE 511; ME 518, provided that:

1. a minimum of nine hours is taken from the Mathematics department (MATH) courses beyond the 15 credit hours required for the CIS degrees
2. permission to take a graduate course is granted.

## Learning Goals

1. Be able to develop innovative mathematical solutions to complex computational problems.
2. Engage in continuous learning to advance their professional careers.