

CIS MATHEMATICS CONCURRENT DEGREE

Student's Name _____

University of Michigan-Dearborn
College of Engineering and Computer Science

ID # _____

Current CECS undergraduate students majoring in *Computer and Information Science* (CIS) or in *Software Engineering* (SE) may pursue a concurrent **Bachelor of Science (B.S.) degree in CIS Mathematics**.

Declare this degree (at 2000 HPEC) in order to earn two degrees concurrently: a principal B.S. degree in CIS, or in SE, and a separate concurrent B.S. degree in *CIS Mathematics*. Both degrees must be earned at the same time.

The CIS Mathematics degree requires a minimum of **sixteen (16) additional and separate credits in advanced mathematics courses** beyond the 120 credits needed for B.S. in CIS or B.S. in Software Engineering. The 16 credits used for the concurrent degree in *CIS Mathematics* do not count towards a student's principal degree.

The B.S. in CIS Mathematics degree requires **a minimum total of thirty (30) credits in mathematics** courses, as follows:

- I **Fourteen (14) credits** of mathematics courses that are already required as part of the B.S. degree in CIS or in SE:
MATH 115 (4), MATH 116 (4), MATH 217 (2) [or MATH 227], and CIS 275 (4) Discrete Structures.
[MATH 227 may be elected instead of MATH 217, but only 14 credits from courses above count for the dual degree.]
- II **Six (6) credits** from: MATH 205 (3 credits), *Calculus III*, and MATH 216 (3 credits), *Differential Equations*
[MATH 215 may be elected instead of MATH 205, but only 6 credits from courses above count for the dual degree.]
- III **Ten (10) credits**, minimum, from the courses below. Note that the MATH instructor's or the Mathematics Department's approval (override) is needed before taking any 500-level MATH course.)

MATH 315	Applied Combinatorics (3 credits)	Prerequisites: Math 217 or Math 227, and Math 200
MATH 372	Computing with Mathematica (3)	Prerequisite: Math 217 or Math 227
MATH 390	Topics in Mathematics (1-3)	<u>PRIOR</u> approval by CECS for use in CIS Math degree needed
MATH 395	Elementary Number Theory (3)	Prerequisite: Math 205 or Math 215
MATH 404	Dynamical Systems (3)	Prerequisites: Math 216 and (either Math 217 or 227)
MATH 405	Integral Equations (3)	Prerequisites: Math 216 and (either Math 217 or 227)
MATH 412	First Course in Modern Algebra (3)	Prerequisites: Math 200 and (Math 217 or Math 227)
MATH 413	Linear Algebra (3)	Prerequisites: Math 200, Math 216, and (Math 217 or 227)
	[Credit for only one from Math 413, Math 513, and Math 523]	
MATH 420	Stochastic Processes (3)	Prerequisites: Math 325 and (either Math 217 or Math 227)
	[Credit for only one from Math 420 and IMSE 506]	
MATH 425	Mathematical Statistics II (3)	Prerequisite: Math 325 or equivalent
MATH 451	Advanced Calculus I (3)	Prereqs: Math 200, Math 216, and (Math 217 or Math 227)
MATH 452	Advanced Calculus II (3)	Prerequisite: Math 451
MATH 454	Fourier Series and Boundary Value Problems (3)	Prereqs: Math 216 and (Math 217 or 227)
MATH 455/555	Functions of a Complex Variable with Applications (3)	Prereqs: Math 216 and (Math 217 or 227)
	[Credit for only one from Math 455 and Math 555]	
MATH 458/558	Introduction to Wavelets (3)	Prerequisites: Math 216 and (either Math 217 or Math 227)
	[Credit for only one from Math 458 and 558]	
MATH 462	Mathematical Modeling (3)	Prerequisites: Math 216 and (either Math 217 or Math 227)
MATH 472	Introduction to Numerical Analysis (3)	Prerequisites: Math 216 and (either Math 217 or Math 227)
MATH 473	Matrix Computation (3)	Prerequisites: Math 216 and (either Math 217 or Math 227)
MATH 514	Numerical Solutions of Partial Differential Equations (3)	Prereqs: Math 216 and (Math 217 or 227)
MATH 515	Approximations of Functions (3)	Prerequisites: Math 216 and (either Math 217 or Math 227)
MATH 516	Partial Differential Equations (3)	Prerequisites: Math 216 and (either Math 217 or Math 227)
MATH 523	Linear Algebra with Applications (3)	Prerequisites: Math 216 and (either Math 217 or Math 227)
	[Credit for only one from Math 413, Math 513, and Math 523]	
MATH 582	Computer Algebra Systems (3)	Prerequisites: Math 216 and (either Math 217 or Math 227)
MATH 583	Discrete Systems (3)	Prerequisite: Math 217 or Math 227
MATH 584	Applied and Algorithmic Graph Theory (3)	Prerequisite: Math 217 or Math 227
MATH 590	Topics in Mathematics and Statistics (3)	<u>PRIOR</u> approval by CECS for use in CIS Math degree needed

The following CECS graduate courses may also be used towards the CIS Mathematics degree: CIS 451, 532, 551, 552; ECE 555, 560, 567, 580; IMSE 505, 506, 510, 511; ME 518, 519, provided that a minimum of nine (9) hours be taken from the Mathematics department (MATH) courses in list III above and that permission to take a graduate course be granted. 12/10
CIS-Math List also online: www.engin.umd.umich.edu/SRA/pdf/curriculum/Dual_CIS_Math_Degree_2007.pdf <link>