## College of Computer, Mathematical and Natural Sciences Computer Science - Quantum Information Effective Fall 2024 This is a cu

Date Entered Major\_\_\_\_\_\_ Second degree/major\_\_

	General Education Requirements					
Fundamental Studies						
Requ	uirement	Course	Credits	Completed?		
AW	Academic Writing		3			
PW	Professional Writing		3			
ОС	Oral Communication		3			
	Distributive	e Studies				
Requ	uirement	Course	Credits	Completed?		
NL	Natural Science with Lab		4			
NS	Natural Science		3 or 4			
HS	History and Social Sciences		3			
HS	History and Social Sciences		3			
HU	Humanities		3			
HU	Humanities		3			
SP	Scholarship in Practice (non-major)		3			
SP	Scholarship in Practice (non-major)		3			
	Big Que	estion				
	Overlap with Distributive Stu	udies and/or Big Question	Τ	I		
Requ	uirement	Course	Credits	Completed?		
IS	Big Question					
IS	Big Question					
	Diver	sity				
	Can overlap with Distributive	e Studies or Big Question	Т	T		
Requ	uirement	Course	Credits	Completed?		
UP	Understanding Plural Societies					
UP or CC	Understanding Plural Societies or Cultural Competence					

Gen Ed Mathematics (MA) and Analytic F	Reasoning (AR) are sat	isfied by major requirements.

Upper Level Concentration				
Students must complete a minimum of 12 credit hours of 300 - 400 level courses in one discipline outside of Computer Science with an average grade of C- or higher. No course that is in, or cross-listed as, CMSC may be counted in this requirement. Only 1 independent study or experiential learning course may be used. Students who are pursuing a minor or a second major can use those credits in this area.				
Course	Credits	Completed?		

**Elective Credits** 

Students must take enough elective courses in any discipline(s) they choose to reach the total number of 120 credits required for graduation. Students who are pursuing a minor or a second major can use those credits in this area.				
Course	Credits	Completed?		

Major Requirements  Lower Level Requirements (Must pass with a grade of C- or higher)				
Calculus I	MATH 140	4		
Calculus II	MATH 141	4		
Object-Oriented Programming I	ON 100 101 2 11 ON 100 111	4		
Programming with Purpose I: Data-Centric Computing	CMSC 131 or CMSC 141	4		
Object-Oriented Programming II		4		
Programming with Purpose II: Data Structures and Algorithms	CMSC 132 or CMSC 142	4		
Introduction to Computer Systems	CMSC 216	4		
Discrete Structures	CMSC 250	4		
Organization of Programming Languages	CMSC 330	3		
Algorithms	CMSC 351	3		
STAT 4xx (w/ MATH 141 prerequisite)	STAT 4XX	3		
Linear Algebra course	MATH 240 or MATH 341 or MATH 461	4		

\_\_\_\_\_ Is CMNS your primary major? Y N

This is a curriculum tracking sheet, not an official audit

Upper Level Courses (Must pass with a grade of C- or higher) Students must fulfill their computer science upper level course requirements from at least 3 areas					
Introduction to Quantum Computing *	CMSC 457	3			
Introduction to Quantum Technology *	PHYS 467	3			

Araa 1. Suatama	Course		
Computer Systems Architecture	CMCC 411	Credits	Completed?
Computer Systems Architecture	CMSC 411	3	
Operating Systems *	CMSC 412	4	
Computer and Network Security	CMSC 414	3	
Introduction to Parallel Computing	CMSC 416	3	
Computer Networks	CMSC 417	3	
Real World Computer Security	CMSC 498I	3	
Area 2: Information Processing	Course	Credits	Completed?
Bioinformatic Algorithms and Methods	CMSC 402	3	
Data Structures	CMSC 420	3	
Introduction to Artificial Intelligence	CMSC 421	3	
Introduction to Machine Learning *	CMSC 422	3	
Bioinformatic Algorithms, Databases and Tools	CMSC 423	3	
Database Design	CMSC 424	3	
Computer Vision *	CMSC 426	3	
Computer Graphics *	CMSC 427	3	
Introduction to Natural Language Processing *	CMSC 470	3	
Introduction to Data Visualization (Area 2 <u>OR</u> Area 3)	CMSC 471	3	
Introduction to Deep Learning *	CMSC 472	3	
Area 3: Software Engineering and Programming Language	Course	Credits	Completed?
Introduction to Compilers	CMSC 430	3	
Programming Language Technologies and Paradigms	CMSC 433	3	
Introduction to Human-Computer Interaction	CMSC 434	3	
Software Engineering *	CMSC 435	3	
Programming Handheld Systems	CMSC 436	3	
Introduction to Data Visualization (Area 2 <u>OR</u> Area 3)	CMSC 471	3	
Area 4: Theory	Course	Credits	Completed?
Design and Analysis of Computer Algorithms	CMSC 451	3	
Elementary Theory of Computation	CMSC 452	3	
Algorithms for Data Science *	CMSC 454	3	
Cryptology	CMSC 456	3	
Introduction to Computational Game Theory	CMSC 474	3	
Area 5: Numerical Analysis	Course	Credits	Completed?
Computational Methods * Introduction to Numerical Analysis *	CMSC 460 or CMSC 466	3	, 233

<sup>\*</sup> Indicates the course has unique prerequisites□

	Upper Level Elective Courses (Must pass with a grade of C- or higher)					
	Select 3 credits from CMSC 300- or 400-level courses (not eligible CMSC330 & CMSC351)					
Title		Course	Credits	Completed?		

## **College of Computer, Mathematical and Natural Sciences** Computer Science - Quantum Information Effective Fall 2024 This is a generalized academic plan, not an official audit Year 1 Fall **Spring** Credit Credit Grade Course Grade Course CMSC131 or CMSC141 CMSC132 or MATH142 Gateway & Benchmark 1 Requirements: MATH140 (FSMA, FSAR) MATH141 CMSC131, CMSC132, ENGL101 (FSAW) 3 Natural Science w/ Lab (DSNL) and MATH140 must be completed with a C- or | Oral Comm (FSOC) 3 History & Social Science (DSHS)\* higher by 45 credits CMSC100 (AP/IB credits excluded) Total 15 Total 15 Year 2 Fall **Spring** Credit Credit Grade Grade Course Course Benchmark 2 CMSC216 CMSC330 Requirements: CMSC250 CMSC351 CMSC330, CMSC351, STAT4XX and MATH or STAT MATH240 or MATH341 or MATH461 3 or 4 must be completed Scholarship in Practice (DSSP)\* Natural Science (DSNS) with a C- or higher by Humanities (DSHU)\* 75 credits (AP/IB credits excluded) 14 or 15 Total 15 Total Fall Year 3 **Spring** Course Credit Credit Grade Course Grade PHYS467 CMSC457 3 CMSC4XX CMSC4XX ENGL39X (FSPW)\*\* History & Social Sciences (DSHS) 3 Humanities (DSHU)\* Scholarship in Practice (DSSP)\* 3 3 Big Question (SCIS) Big Question (SCIS) Total 15 Total 15 Fall Year 4 **Spring** Course Credit Grade Course Credit Grade CMSC Elective CMSC4XX 3 3 CMSC4XX 3 UL Concentration **UL** Concentration **UL Concentration** 3 Plural Societies (DVUP) or Cultural Competence (DVCC)\* UL Concentration 3 Plural Societies (DVUP)\* 3 Elective 3 or 4 15 Total Total 15 or 16 \*All students must complete two Distributive Studies courses that are approved for Big Question courses. The Understanding Plural Societies (UP) and Cultural Competence (CC) courses may also fulfill Distributive Studies categories.

\*\*Students may take any Professional Writing course to fulfill this requirement.