Master of Science in Computer Science

Catalog Year: 2024 Total Degree Credit hours: 30 at the 6000 level or above

For students who are interested in this program but do not have the required prerequisite knowledge, completion of the Graduate Certificate in Computer Science Foundations is required prior to admission to the MSCS program.

Computer Science Foundation Courses (12 Credit Hours)

	Prerequisites		
CS 5000 Foundations of Programming	-	3	
CS 5020 Computer Architectures and Operating Systems	-	3	
CS 5040 Data Structures and Algorithms	CS 5000	3	
CS 5070 Mathematical Structures for Computer Science	Undergraduate Calculus course recommended	3	

Core Courses (6 Credit Hours)

	Prerequisites		
CS 6041 Theory of Computation	**Pre:** CS 5070 **Concurrent:** CS 5040	3	
Cs 6045 Advanced Algorithms	CS 5040 and CS 5070	3	

MSCS Program Model Options

A) **Professional Model**: The professional model is designed for students who plan to advance their knowledge in computer science and apply their knowledge to industrial applications. It consists of 6 hours program core, and 24 hours elective courses.

B) **Thesis Model:** The thesis model is designed for students who plan to conduct computer science research under the supervision of faculty members in selected areas. It consists of a 6 hours program core, 6 hours thesis (CS 7999), 3 hours research (CS 7998), and 15 hours elective courses. Students choose this model should work with a faculty thesis advisor. Thesis needs to be defended and approved by a thesis committee that consists of at least 3 members.

Thesis Model Courses (24 Credit Hours)

CS 7998 Research in Computer Science	Varies	1-3	
CS 7999 Thesis (Will be repeated for a total of 6 credits)	Permission of Program Director	6	
Complete 15 credit hours, at least 12 being from 7000+ level. May choose to complete 1 concentration area or a combination of elective courses. Elective courses can be any CS 6000-, 7000-, or 8000-level course, CSE 7983 or DS 7900 (one time only).	Varies	15	

Professional Model Courses (24 Credit Hours)

Complete 24 credit hours, at least 18 being from 7000+ level *excluding CS 7998 and CS 7999*. May choose to complete 1 concentration area or a combination of elective courses. Elective courses can be any CS 6000-, 7000-, or 8000-level course, CSE 7983 or DS 7900 (one time only).	Varies	24	

Computer Science Concentrations

Artificial Intelligence Required Classes	**Prerequisites**		
CS 7375 Artificial Intelligence	CS 6045	3	
CS 7267 Machine Learning	CS 6045	3	
CS 7347 Natural Language Processing	CS 6041	3	
Elective Options			

CS 7075 Artificial Intelligence and Robotics	CS 5020	3	
CS 7253 Graph Algorithms	CS 6041 and CS 6045	3	
CS 7263 Information Retrieval	CS 6041 and CS 6045	3	
CS 7357 Neural Networks and Deep Learning	CS 6045	3	
CS 7367 Machine Vision	CS 6045	3	
CS 7990 Special Topics in Computer Science	Varies	3	
CS 7992 Directed Studies (may only take once)	Permission	1-3	
CSE 7983 Graduate Internship or **DS 7990** Applied Analytics Project (may only take once)	Permission		

Data Science Required Classes

	Prerequisites		
CS 7265 Big Data Analytics	CS 6045	3	
CS 7267 Machine Learning	CS 6045	3	
STAT 8240 Data Mining I	See Director of PhD in Analytics	3	
Elective Options			
CS 6025 Operating Systems	**Pre:** CS 5020 **Concurrent:** CS 5040	3	
CS 6070 Database Systems	CS 5000	3	
CS 7050 Data Warehousing and Mining	**Pre:** CS 6070 **Concurrent:** CS 6045	3	
CS 7125 Cloud Computing	CS 5020	3	
CS 7253 Graph Algorithms	CS 6041 and CS 6045	3	
CS 7260 Advanced Database Systems	CS 6070 or BSCS degree	3	
CS 7263 Information Retrieval	CS 6041 and CS 6045	3	
CS 7347 Natural Language Processing	CS 6041	3	
CS 7357 Neural Networks and Deep Learning	CS 6045	3	
CS 7367 Machine Vision	CS 6045	3	
CS 7375 Artificial Intelligence	CS 6045	3	
CS 7990 Special Topics in Computer Science	Varies	3	
CS 7992 Directed Studies (may only take once)	Permission of Dept		
STAT 7210 Applied Regression Analysis	STAT 7100 and STAT 7020	3	
STAT 8250 Data Mining II	STAT 8240	3	
MATH 8020 Graph Theory	Permission of Dept	3	
MATH 8030 Applied Discrete & Combinatorial Mathematics for Data Analysts	Permission of Dept	3	
CSE 7983 Graduate Internship or **DS 7990** Applied Analytics Project (may only take once)	Permission		

Cyber and Network Security Required Classes

	Prerequisites		
CS 6027 Computer Networks	CS 5000 and CS 5020	3	
CS 7530 Advanced Cryptography	**Pre:** CS 6041 **Concurrent:** CS 6045	3	
CS 7540 Network Security	CS 7530 and CS 6027	3	
Elective Options			
CS 6025 Operating Systems	**Pre:** CS 5020 **Concurrent:** CS 5040	3	
CS 7535 Software and OS security	CS 6025 or BSCS degree	3	
CS 7537 Digital Forensics	CS 6025 and CS 6021	3	
CS 7545 AI for Security and Privacy	CS 7530	3	
CS 7550 Internet of Things Security	**Pre**: CS 7530 **Concurrent:** CS 7540		
CS 7990 Special Topics in Computer Science	Varies	3	
CS 7992 Directed Studies (may only take once)	Permission of Dept	1-3	
CSE 7983 Graduate Internship or **DS 7990** Applied Analytics Project (may only take once)	Permission	3	