

Catalog Year: 2020

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

	Prerequisites	Credits	
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

	Prerequisites	Credits	
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:** Student must complete 24 credit hours from Major Elective list. Students can select one concentration area and complete its requirements or have the option to select courses from the CS Major Elective lists. At least 18 credit hours must be from 7000-level or higher, excluding CS 7998 and CS 7999.

B) **Thesis Model:** Students must complete 6 hours thesis (CS 7999), 3 hours research (CS 7998). In addition, student must complete 15 credit hours from Major Elective list. Students can select one concentration area and complete its requirements or have the option to select courses from the Major Electives list. At least 12 credit hours must be from 7000-level or higher. 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.

Computer Science Concentrations (12 Credit Hours)

Artificial Intelligence

Prerequisites

	Prerequisites	Credits	
CS 7375 Artificial Intelligence	Concurrent: CS 6045	3	
CS 7267 Machine Learning	CS 6045	3	
CS 7367 Machine Vision	CS 6045	3	
CS 7347 Natural Language Processing	CS 6041 and CS 7843	3	
CS 7357 Neural Networks and Deep Learning	CS 6045	3	
CS 7990 Special Topics in Computer Science in <i>Concentration</i>	Varies	3	

Data Computing		Prerequisites	
CS 7050 Data Warehousing and Mining		Pre: CS 6070 or BSCS degree Concurrent: CS 6045	3
CS 7263 Information Retrieval		CS 6041 and CS 6045	3
CS 7265 Big Data Analytics		CS 6045	3
CS 7172 Parallel and Distributed Computing		CS 6025 or BSCS degree	3
CS 7253 Graph Algorithms		CS 6041 and CS 6045	3
CS 7990 Special Topics in Computer Science in <i>Concentration</i>		Varies	3

Cyber and Network Security		Prerequisites	
CS 7530 Advanced Cryptography		Pre: CS 6041 Concurrent: CS 6045	3
CS 7535 Software and OS security		CS 6025 or BSCS degree	3
CS 7540 Network Security		CS 7530 and CS 6027	3
CS 7545 AI for Security and Privacy		CS 7530	3
CS 7990 Special Topics in Computer Science in <i>Concentration</i>		Varies	3

Additional CS Electives

CS 6070 Database		CS 5000	3
CS 6025 Operating System		Pre: CS 5020 Concurrent: CS 5040	3
CS 6027 Computer Networks		CS 5000 and CS 5020	3
CS 7843 Theory of Programming Languages		CS 5070	3
CS 6021 Advanced Computer Architecture		CS 5020	3
CS 7125 Cloud Computing		CS 5020	3
CS 7260 Advanced Database Systems		CS 6070	3
CS 7425 Wireless and Mobile Computing			3
CS 7455 Mobile App Development		CS 5000	3
CS 7327 Computer Graphics and Multimedia		CS 5040	3
CS 7990 Special Topics in Computer Science		Varies	3
CS 7991 Advanced Topics in Computer Science		-	3
CS 7992 Directed Studies		-	1-3
CSE 7983 Graduate Internship or DS 7900 Applied Analytics Project Course		-	3

Thesis Track Additional Courses (9 Credit Hours)

CS 7998 Research in Computer Science		Varies	1-3
CS 7999 Thesis (May be repeated)		Permission of Program Director	6

Course Path for Each Concentration

Cyber & Network Security		Artificial Intelligence		Data Computing	
BSCS degree	None-computing Degree	BSCS degree	None-computing Degree	BSCS degree	None-computing Degree
	CS 5000		CS 5000		CS 5000
	CS 5020		CS 5020		CS 5020
	CS 5040		CS 5040		CS 5040
	CS 5070		CS 5070		CS 5070
CS 6041	CS 6041	CS 6041	CS 6041	CS 6041	CS 6041
CS 6045	CS 6045	CS 6045	CS 6045	CS 6045	CS 6045
CS 6027	CS 6027	CS 7843	CS 7843		CS 6070
	CS 6025				CS 6025
		CS 7375	CS 7375	CS 7050	CS 7050
CS 7530	CS 7530	CS 7267	CS 7267	CS 7265	CS 7265
CS 7535	CS 7535	CS 7367	CS 7367	CS 7172	CS 7172
CS 7540	CS 7540	CS 7347	CS 7347	CS 7263	CS 7263
CS 7545	CS 7545	CS 7357	CS 7357	CS 7253	CS 7253