COMPUTER SCIENCE, MSCS—ALIGN PROGRAM

MSCS-Align students come from a wide variety of backgrounds—with undergraduate majors ranging from math, biology, history, engineering, and classics. In this program, students have an opportunity to acquire both the knowledge needed to transition into a new career and the practical skills to build the next great app. In this program, students may learn to:

Learning Outcomes

- Exhibit proficiency in the design, implementation and testing of software
- Demonstrate skills and experience working in small teams
- Apply algorithmic and theoretical computer-science principles to solve computing problems from a variety of application areas
- Demonstrate the ability to learn and develop competencies in specialized or emerging computer science fields

Complete all courses and requirements listed below unless otherwise indicated.

ALIGN Bridge Coursework

A grade of B or higher is required in each course.

Fundamentals		
CS 5001 and CS 5003	Intensive Foundations of Computer Science and Recitation for CS 5001	4
Discrete Structures		
CS 5002	Discrete and Data Structures	4
Object-Oriented Design		
CS 5004 and CS 5005	Object-Oriented Design and Recitation for CS 5004	4
Additional ALIGN courses		
CS 5006	Algorithms	2
CS 5007	Computer Systems	2

Core Requirements

A cumulative 3.000 GPA is required for the core courses:

Development		
CS 5500 or CS 5600	Foundations of Software Engineering Computer Systems	4
Algorithms		
CS 5800	Algorithms	4

Electives

Complete 20 semester hours from the following. A minimum of 8 semester hours must be taken from the same specialization.	20
CS 5100 to CS 5850	
CS 6110 to CS 6810	
CS 7140 to CS 7380	
CS 7470 to CS 7580	
CS 7670 to CS 7785	
CS 7810 to CS 7880	
CS 8674 Master's Project	

CS 8982	Readings
CS 7990	Thesis
Specializations	
Artificial Intelligence	
CS 5100	Foundations of Artificial Intelligence
CS 5335	Robotic Science and Systems
CS 6120	Natural Language Processing
CS 6140	Machine Learning
CS 7140	Advanced Machine Learning
CS 7180	Special Topics in Artificial Intelligence
Computer-Human Interface	
CS 5340	Computer/Human Interaction
CS 6350	Empirical Research Methods
CS 7140	Advanced Machine Learning
Data Science	
CS 5200	Database Management Systems
CS 6140	Machine Learning
CS 6200	Information Retrieval
CS 6220	Data Mining Techniques
CS 6240	Large-Scale Parallel Data Processing
CS 7280	Special Topics in Database Management
CS 7290	Special Topics in Data Science
CS 7295	Special Topics in Data Visualization
Game Design	
CS 5150	Game Artificial Intelligence
CS 5310	Computer Graphics
CS 5340	Computer/Human Interaction
CS 5850	Building Game Engines
CS 7140	Advanced Machine Learning
Graphics	
CS 5310	Computer Graphics
CS 5330	Pattern Recognition and Computer Vision
CS 5520	Mobile Application Development
Information Security	
CS 6760	Privacy, Security, and Usability
CS 7485	Special Topics in Formal Methods
CS 7580	Special Topics in Software Engineering
CS 7810	Foundations of Cryptography
CY 5770	Software Vulnerabilities and Security
CY 6740	Network Security
CY 6750	Cryptography and Communications Security
Networks	
CS 5700	Fundamentals of Computer Networking
CS 6710	Wireless Network

CS 6760	Privacy, Security, and Usability
CS 7775	Seminar in Computer Security
CS 7780	Special Topics in Networks
CY 6740	Network Security
CY 6750	Cryptography and Communications Security
Programming Languages	
CS 5400	Principles of Programming Language
CS 6410	Compilers
CS 6510	Advanced Software Development
CS 7480	Special Topics in Programming Language
Software Engineering	
CS 5610	Web Development
CS 6510	Advanced Software Development
CS 6650	Building Scalable Distributed Systems
CS 7580	Special Topics in Software Engineering
Systems	
CS 7680	Special Topics in Computer Systems
CY 6740	Network Security
Theory	
CS 6800	Application of Information Theory
CS 7805	Theory of Computation
CS 7880	Special Topics in Theoretical Computer Science
CY 6750	Cryptography and Communications Security

Program Credit/GPA Requirements

44 total semester hours required
Minimum 3.000 GPA required