## **Doctor of Philosophy in Data Science & Analytics**



Updated 9/8/2023

Catalog Year: 2023-2024 Total Degree Credit Hours: 78

Kennesaw State University's Ph.D. with a major in Data Science and Analytics is an advanced degree, which trains individuals to translate large, structured and unstructured, complex data into information to improve decision-making, and become independent researchers. This highly interdisciplinary curriculum includes heavy emphasis on programming, machine learning, artificial intelligence, data mining, statistical modeling, and the mathematical foundations to support these concepts. The program also emphasizes communication skills, data ethics, and application of results to business and research problems. Graduates can pursue a position in the private or public sector as a "practicing" Data Scientist or a position within academia, where they are uniquely qualified to teach the next generation of data scientists.

Course Number/Title	Prerequisite	Credits	<
CS 8265: Advanced Big Data Analytics	Admission to Program	3	
CS 8267: Advanced Machine Learning	Admission to Program	3	
MATH 8020: Graph Theory	Admission to Program	3	
MATH 8030: Applied Discrete & Combinatorial Mathematics for	Admission to Program	3	
Data Analysts			
STAT 8240: Data Mining I	Admission to Program	3	
STAT 8250: Data Mining II	STAT 8240	3	
DS 9700: Doctoral Internship (repeat for a total of 6 credits)	Ph.D. candidacy	6	

#### Research Requirement (33 credit hours)

Students will take a minimum of 15 hours of DS 9900 in order to graduate. This course should only be taken by students who have already completed comprehensive exams or with permission of the program coordinator.

Semesters	Topic	Credits	<b>&gt;</b>
		1-6	
		1-9	
	Semesters	Semesters Topic	1-6

### Electives and Concentration (21 credit hours)

Students can take up to 9 credit hours for 6000 or 7000 level courses in DS, STAT, or CS with permission of the program director. Students can take any 8000 or 9000 level course in DS, STAT, MATH, CS, or IT (other disciplines by permission of the director).

Course Number/Title	Prerequisite	Credits	~
		3	
		3	
		3	
		3	
		3	
		3	
		3	

# **Computer Science Concentration**

Students interested in pursuing a concentration in Computer Science must take at least 15 credit hours in CS courses at 8000 or 9000 levels (except CS 9900).

Course Number/Title	Prerequisite	Credits	~
CS 8025: Advanced Operating Systems	Admission to Program	3	
CS 8027: Advanced Networking & Architecture	Admission to Program	3	
CS 8041: Advanced Theory of Computation	Admission to Program	3	
CS 8045: Advanced Design and Analysis of Algorithms	Admission to Program	3	
CS 8050: Principles of Software Design & Programming	Admission to Program	3	
Languages			
CS 8125 Advanced Cloud Computing	Admission to program	3	
CS 8172 Advanced Parallel and Distributed Computing	CS 8025 (may take concurrent)	3	
CS 8253 Advanced Graph Algorithms	CS 8045 (may take concurrent)	3	
CS 8260 Advanced Database Systems and Applications	Admission to program	3	
CS 8263 Advanced Information Retrieval	CS 8045 (may take concurrent)	3	
CS 8265: Advanced Big Data Analytics	Admission to program	3	
CS 8267: Advanced Machine Learning	Admission to program	3	
CS 8347 Advanced Natural Language Processing	CS 8041 (may take concurrent)	3	
CS 8357 Advanced Neural Networks and Deep Learning	CS 8045 (may take concurrent)	3	
CS 8367 Advanced Computer Vision	CS 8045 (may take concurrent)	3	
CS 8375 Advanced Artificial Intelligence	CS 8045 (may take concurrent)	3	
CS 8540 Advanced Network Security	CS 8027 (may take concurrent)	3	
CS 8545 Advanced AI for Security and Privacy	CS 8045 (may take concurrent)	3	
CS 8990 Advanced Special Topics in Computer Science	Depends on topic	3	
CS 8992 Advanced Directed Studies	Admission to program	1-3	
CS 8998 Advanced Research in Computer Science	Varies	1-3	

### **Statistics Concentration**

Students interested in pursuing a concentration in Statistics must take at least 15 credit hours in STAT courses at 8000 or 9000 levels.

Course Number/Title	Prerequisite	Credits	<b>&gt;</b>
STAT 8220: Time Series Forecasting	STAT 7020 & STAT 7210	3	
STAT 8320: Applied Multivariate Data Analysis	STAT 7220 & STAT 7210	3	
STAT 8330: Applied Binary Classification	STAT 7210	3	
STAT 8350: Structural Equation Modeling	Admission to Program	3	
STAT 8450: Multilevel Statistical Modeling	Admission to Program	3	