

Master of Science

Data Science and Analytics with a Concentration in Physics (MS)

Sampath Jayarathna, Graduate Program Director, and Balša Terzi#, Physics Concentration Coordinator.

Physics Concentration

The purpose of this concentration is to provide students with a thorough understanding of the methods and technologies to handle big data and to instill physics problem-solving skills rooted in big data solutions. It prepares them to become professionals trained in advanced data analytics, with the ability to transform large streams of multiple data sources into understandable and actionable information for the purpose of making decisions. The coursework enables the students to achieve a comprehensive list of tasks including collecting, storing, processing, and analyzing data, reporting statistics and patterns, drawing conclusions and insights, and making actionable recommendations.

Admission

The requirements for admission to the Master of Science in Data Science and Analytics are as follows:

1. A baccalaureate degree in computer science, electrical and/or computer engineering, mathematics, statistics, information system & technology, or a related field from a regionally-accredited institution or an equivalent institution outside the U.S.; students holding a bachelor's degree in an unrelated field will need competency in topics related to basic statistics and computer science.
2. GRE scores with a 50% or better attainment on quantitative reasoning (or waiver (https://www.odu.edu/sites/default/files/documents/GRE-Waiver_1.pdf))
3. Current scores on the Test of English as a Foreign Language (TOEFL) of at least 230 on the computer-based TOEFL or 79 on the TOEFL iBT, or IELTS 6.5 overall.

Curriculum Requirements

The program requires 30 credit hours. The curriculum includes two concentrations: computational data analytics and, business intelligence and analytics. A capstone project is required.

Data Science & Analytics Core

Core Requirements 15

DASC/CS 620	Introduction to Data Science and Analytics
CS 624	Data Analytics and Big Data
CS 625	Data Visualization
STAT 603	Statistical/Probability Models for Data Science and Analytics
STAT 604	Statistical Tools for Data Science and Analytics

Total Credit Hours for Concentration 12

Required Courses

PHYS 556 or PHYS 621	Intermediate Quantum Mechanics Quantum Mechanics I
PHYS 603	Classical Mechanics
PHYS 604	Classical Electrodynamics I

Elective Course *

Select one of the following:

PHYS 517	Introduction to Particle Accelerator Physics
PHYS 696	Special Topics in Accelerator Physics
PHYS 755	Experimental and Computational Techniques in Accelerator Physics
PHYS 513	Methods of Experimental Physics
PHYS 515	Introduction to Nuclear Particle Physics
PHYS 871	Introduction to Quantum Field Theory I
PHYS 595	Special Topics in Physics
PHYS 795	Special Topics in Physics
PHYS 520 or PHYS 711	Introductory Computational Physics Computational Physics
PHYS 804	Classical Electrodynamics II

Capstone Course 3

Total Credit Hours 30

* Other courses may be used to fulfill the elective requirement with the approval of the Graduate Program Director.