Master of Science in Data Science

The Master of Science in Data Science (MS DSc) program is offered by the Department of Robotics and Artificial Intelligence. This two-year evening program requires the completion of 30 credit hours. The curriculum includes 3 core courses, 2 specialization courses in data science, and 3 elective courses. Additionally, students have the option to complete the MS DSc either through coursework or with research work. For those choosing the coursework route, it is mandatory to complete 2 additional courses, each worth 3 credit hours. On the other hand, students opting for the research path must undertake either 2 Independent Research Studies (IRS), totaling 6 credit hours, or a research thesis, also totaling 6 credit hours. The maximum allowable duration to complete the MS DSc degree is 4 years.

Program Objectives

The MS DSc program is designed to aimed the following program objectives:

PEO 1: To equip students to transform data into actionable insights to make complex business decisions.
PEO 2: To enable students, understand and analyze a problem and arrive at computable solutions.
PEO 3: To expose students to the set of technologies that match those solutions.
PEO 4: To gain hands-on experience on data-centric tools for statistical analysis, visualization and big data applications at the same rigorous scale as in a practical data science project.
PEO 5: To understand the implications of handling data in terms of data security and business ethics.

First Year

First Semester

DSC 5101 Statistical and Mathematical Methods for Data Science
DSC 5105 Tools and Techniques in Data Science
DSC xxxx Elective-I

Second Semester

DSC 5201 Machine Learning
DSC xxxx Specialization-Elective-I
DSC xxxx Specialization-Elective-II

DISTRIBUTION OF CREDIT HOURS	
Course Types	Cumulative Credits
Core courses (3)	9
Specialization Requirement Courses (2)	6
Electives (3)	9
Thesis (I & -II) or Elective (II & V) or Independent Research Study (I & II)	6
Total	30

Second Year

Third Semester

DSC xxxx Thesis-I or Elective-II or Independent Research Study-I
DSC xxxx Elective-III

Fourth Semester

DSC xxxx Elective-IV
DSC xxxx Thesis-II or Elective-V or Independent Research Study-II

FACULTY OF COMPUTING AND ENGINEERING SCIENCES

Core Courses	Cr.Hrs
DSC 5101 Statistical and Mathematical Methods for Data Science	3
DSC 5105 Tools and Techniques in Data Science	2 + 1*
DSC 5201 Machine Learning	3

* 2+1 means 2 hours of lecture + 3 hours of lab work

Specialization Courses	Cr.Hrs
DSC 5242 Big Data Analytics	3
DSC 5223 Deep Learning	3
DSC 5241 Natural Language Processing	3
DSC 5243 Distributed Data Processing	3

Deficiency Courses
DSC xxxx Programming Fundamentals (Core Programming Course)
DSC xxxx Data Structures and Algorithms OR Design and Analysis of Algorithms
DSC xxxx Database Systems

Elective Courses

DSC 5121 Cloud Computing
DSC 5122 Data Visualization
DSC 5125 Algorithmic Trading
DSC 5126 Bioinformatics
DSC 5127 Distributed Data Processing and Machine Learning
DSC 5128 Inference and Representation
DSC 5129 Optimization Methods for Data Science and Machine Learning
DSC 5131 Social Network Analysis
DSC 5132 Time-Series Analysis and Prediction
DSC 5221 Advanced Computer Vision
DSC 5222 Research Methodology
DSC 5223 Deep Learning
DSC 5224 Bayesian Data Analysis
DSC 5225 Computational Genomics
DSC 5226 Deep Reinforcement Learning
DSC 5227 Distributed Machine Learning in Apache Spark
DSC 5228 High-Performance Computing
DSC 5229 Probabilistic Graphical Models
DSC 5231 Scientific Computing in Finance
DSC 5241 Natural Language Processing
DSC 5242 Big Data Analytics
DSC 5243 Distributed Data Processing

All courses may not be offered in every semester.

Elective courses may vary from time to time.

Alternative courses may be substituted as and when required.