

M.S. in Data Science

Embry-Riddle's Master of Science in Data Science (MSDS) equips students with the practical skills needed to transform data into actionable decisions. The program prepares graduates to meet the challenges of the big data revolution using the latest computational and analytical tools.

The interdisciplinary coursework, world-renowned faculty, and state-of-the-art labs enable students to work collaboratively within distinct tracks of data specialization. Graduates are trained to lead industries such as aviation, cybersecurity, business, homeland security, and safety using advanced data analysis strategies.

With demand for data scientists expected to grow significantly by 2034, according to the U.S. Bureau of Labor Statistics, an MSDS from Embry-Riddle enhances marketability and positions graduates for success across a wide range of high-demand sectors.

The Master of Science in Data Science at the **Daytona Beach Campus** is housed in the College of Arts and Sciences' Department of Mathematics. In this advanced program, students develop strong skills in data collection, pre-processing, analysis, visualization, and ethical considerations in data science.

All core courses are project-based, allowing students to apply what they learn through hands-on assignments and real-world problem solving. The program culminates in a capstone project or an internship in a chosen domain area, providing valuable professional experience and preparing students to clearly communicate insights through effective data visualization.

Specializations

The program offers flexibility for students to choose one of five specialization tracks:

- Aviation Business
- Aviation Safety
- Cybersecurity
- High-Performance Computing and Big Data
- Intelligence and Security
- Human Factors and Bioinformatics

Program-Level Student Learning Outcomes

Students will:

- Apply statistical inference and machine learning tools to real industry applications obtained by methods including case studies or detailed literature reviews.
- Apply data mining and database knowledge to identify, retrieve, cleanse and store data.
- Apply previous project-based coursework to solve new unknown problems.

Daytona Beach Program Requirements

Core Requirements	15
Specialization	9-12
Option	3
Total Credits	30

Core Requirements

DSCI 500	Database and Information Retrieval	3
DSCI 540	Data Mining	3
DSCI 544	Data Visualization	3
DSCI 615	Data Modeling	3

MATH 506	Probability and Statistical Inference	3
Total Credits		15

Specialization

High-Performance Computing and Big Data

Choose Four of the Following:		
MATH 510	Fundamentals of Optimization	3
SCLM 511	Operations Research	3
DSCI 505	Statistics for Data Science	3
MATH 532	Numerical Linear Algebra for Engineers	3
DSCI 625	Data Compression for Image and Signal Processing	3
MATH 553	High Performance Scientific Computing	3
DSCI 565	Data-Intensive Distributed Computing	3
DSCI 635	Generative Data Modeling	3
DSCI 645	Reinforcement Learning for Intelligent Decision Systems	3
Total Credits		12

Aerospace Engineering

Choose Four of the Following:		
AERO 504	Advanced Compressible Flow	3
AERO 515	Introduction to the Finite Element Method	3
AERO 516	Computational Aeronautical Fluid Dynamics	3
AERO 521	Viscous Flow	3
AERO 522	Analysis of Aircraft Composite Materials	3
AERO 523	Linear Systems	3
AERO 527	Modern Control Systems	3
AERO 528	Advanced Incompressible Aerodynamics	3
AERO 544	Analytical Dynamics	3
MECH 548	Introduction to Continuum Mechanics	3
MATH 532	Numerical Linear Algebra for Engineers	3
Total Credits		12

Aviation Business

Choose Four of the Following:		
ACCT 517	Accounting for Decision Making	3
SCLM 511	Operations Research	3
ECON 523	Advanced Aviation Economics	3
BUAN 610	Airline Optimization and Simulation Systems	3
BUAN 612	Data Analytics for Aviation Business	3
AVMG 645	Airport Operations and Management	3
FINE 520	Managerial Finance	3
FINE 621	International Aviation Finance	3
FINE 623	Aircraft Funding Legal and Financial Analysis	3
FINE 624	Aircraft Transaction and Risk Modeling	3
Total Credits		12

Cybersecurity

Choose Four of the Following:		
CPSC 525	Current Topics in Cybersecurity	3
CPSC 527	System Exploitation and Penetration Testing	3
CPSC 528	Multi-Agent Systems	3
CPSC 529	Computer Security	3
CPSC 532	Software Security Assessment	3
CPSC 538	Applied Cryptography	3
CPSC 602	Big Data Analytics for Cybersecurity	3
DSCI 625	Data Compression for Image and Signal Processing	3

DSCI 565	Data-Intensive Distributed Computing	3
Total Credits		12

Aviation Safety

Choose Four of the Following:

ASCI 604	Human Factors in the Aviation/Aerospace Industry	3
AVSF 611	Aviation/Aerospace System Safety	3
AVSF 612	Aviation/Aerospace Industrial Safety Management	3
MSAV 608	Aviation/Aerospace Accident Investigation and Analysis	3
MSAV 621	Aviation/Aerospace Safety Program Management	3
AVSF 627	Aviation Safety Data Management and Analysis	3
ASCI 693	Current Research Problems in Aviation/Aerospace	3
MSAV 628	Data Analytics for Aviation Safety	3
Total Credits		12

Human Factors and Bioinformatics

Choose Four of the Following:

HFCT 501	Human Factors in Systems	3
HFCT 515	Ergonomics for Human Factors	3
HFCT 614	Human Factors in Medicine	3
HFCT 615	Sensation and Perception for Human Factors	3
HFCT 620	Memory and Cognition	3
HFCT 627	User Experience	3
HFCT 635	Human-Computer Interaction	3
HFCT 526	Aerospace Physiology	3
HFCT 500-Level Course (Approved by Program Coordinator)		3
Total Credits		12

Intelligence and Security

Choose Four of the Following:

MHSR 500	Introduction to Human Security	3
MHSR 511	Cybersecurity, Governance, and Human Security	3
MHSR 515	International Law and U.S. Security Policy	3
MHSR 520	Principles of International Conflict Resolution	3
MHSR 530	Environmental Security	3
HLSC 550	Advanced Topics in Terrorism	3
INTL 502	Data Analytics for Counterterrorism	3
INTL 505	Intelligence and Emerging Security Issues	3
INTL 500-Level (Approved by Program Coordinator)		3
HLSC 500-Level (Approved by Program Coordinator)		3
Total Credits		12

Option

Thesis Option

DSCI 700	Graduate Thesis *	6
Total Credits		6

Graduate Research Option

DSCI 690	Graduate Research Project in Data Science	3
Total Credits		3

Internship Option

COIN 696	Graduate Internship **	3
Total Credits		3

* Thesis need to be taken for 6 credits, 3 credits of which will replace one elective from chosen track

** A second internship may be approved for another 3 credits to replace one elective from chosen track

Suggested Plan of Study

Year One

Requirements	Credits
MATH 506 - Probability and Statistical Inference	3
DSCI 544 - Data Visualization	3
Specilization	3
Semester Hours	9

Requirements	Credits
DSCI 500 - Database and Information Retrieval	3
DSCI 540 - Data Mining	3
Specialization	3
Semester Hours	9

Total Credits

Total Hours for All Requirements: 18

Year Two

Requirements	Credits
DSCI 615 - Data Modeling	3
Specialization or Option	3
Semester Hours	6

Requirements	Credits
Specialization or Option	3
Option	3
Semester Hours	6

Total Credits

Total Hours for All Requirements: 12