

M.S. in Aerospace Engineering

Daytona Beach Program Requirements

Core Requirements	6
Graduate Mathematics	3
Option	21
Total Credits	30

Core Requirements

Area of Concentration

Core Requirements based on Area of Concentration

Aerodynamics and Propulsion

Choose Two of the Following:	6
AERO 504 Advanced Compressible Flow	
AERO 521 Viscous Flow	
AERO 528 Advanced Incompressible Aerodynamics	
Thesis Option: complete 12 credits, or Non-Thesis Option: complete 21 credits	12-21
AERO 507 Design, Build and Test	
AERO 508 Intermediate Heat Transfer	
AERO 512 Combustion I	
AERO 516 Computational Aeronautical Fluid Dynamics	
AERO 524 Rocket Engine Propulsion Systems	
AERO 536 Rotorcraft Aerodynamics	
AERO 550 Thermodynamics: Classic and Modern Perspectives	
AERO 554 Applied Engineering Analysis	
AERO 596 Graduate Internship in Aerospace Engineering	
AERO 610 Advanced Computational Fluid Dynamics	
AERO 625 Hypersonic Aerospace Propulsive Flows	
AERO 631 Aeroacoustics	
AERO 635 Flow Stability and Control	
AERO 640 Turbine Engine Propulsion Systems	
AERO 652 Turbulent Flows	
AERO 699 Special Topics in Aerospace Engineering	
Total Credits	18-27

Dynamics and Control

Choose Two of the Following:	6
AERO 523 Linear Systems	
AERO 527 Modern Control Systems	
AERO 531 Orbital Mechanics	
AERO 544 Analytical Dynamics	
Thesis Option: complete 12 credits, or Non-Thesis Option: complete 21 credits	12-21
ENGP 505 Spacecraft Dynamics and Control	
AERO 506 Airplane Dynamic Stability	
AERO 526 Engineering Optimization	
AERO 552 Unconventional Aircraft Design	
AERO 553 Hybrid and Urban Air Mobility	
AERO 554 Applied Engineering Analysis	
AERO 596 Graduate Internship in Aerospace Engineering	
AERO 623 Navigation, Guidance and Control	
AERO 626 Advanced Topics in Discrete Control Theory	

AERO 627	Adaptive Control	
AERO 629	Robust Control Systems	
AERO 633	Optimal Control	
AERO 646	Nonlinear Systems	
AERO 654	Geometric Mechanics and Control of Rigid Body Motions	
AERO 678	Estimation of Dynamic Systems	
AERO 699	Special Topics in Aerospace Engineering	
Total Credits		18-27

Structures and Materials

Choose Two of the Following:		6
AERO 502	Strength and Fatigue of Materials	
AERO 510	Aircraft Structural Dynamics	
AERO 522	Analysis of Aircraft Composite Materials	
Thesis Option: complete 12 credits, or Non-Thesis Option: complete 21 credits		12-21
AERO 511	Engineering Materials Selection	
AERO 515	Introduction to the Finite Element Method	
AERO 520	Perturbation Methods in Engineering	
AERO 525	Structural Design Optimization	
AERO 532	Engineering Materials and Failure Analysis	
AERO 534	Smart Materials in Engineering	
AERO 538	Theory of Elasticity	
AERO 540	Structural Health Monitoring	
AERO 542	Mechanics of Structures: Variational and Computational Methods	
AERO 554	Applied Engineering Analysis	
AERO 596	Graduate Internship in Aerospace Engineering	
AERO 606	Finite Element Aerospace Applications	
AERO 612	Analysis of Aircraft Plate and Shell Structures	
AERO 616	Advanced Aircraft Structural Dynamics	
AERO 618	Aeroelasticity	
AERO 648	Thermal Stresses in Aerospace Engineering	
AERO 699	Special Topics in Aerospace Engineering	
Total Credits		18-27

Graduate Mathematics

Students are encouraged to consult an advisor within their respective areas.

Aerodynamics and Propulsion and Structures and Materials Concentrations

MATH 502 Boundary Value Problems	3
or ENGP 501 Numerical Methods for Engineers and Scientists	
Total Credits	3

Dynamics and Control Concentration

MATH 532 Numerical Linear Algebra for Engineers	3
or MATH 502 Boundary Value Problems	
or MATH 510 Fundamentals of Optimization	
Total Credits	3

Non-Thesis Option

Electives (at most six hours of non-AERO courses in Engineering Physics, other Engineering, Math, or SCLM 511, with Program Coordinator approval)	21
Total Credits	21

Thesis Option

The thesis advisor must be a member of the AE Department faculty.

To remain on track for Thesis work, the student must submit a Topic Statement upon completion of the first 3 credit hours of Thesis. Upon completion of the second 3 credit hours of Thesis, the student is required to conduct a pre-defense. Consult with the graduate program coordinator for additional information.

Electives (at most six hours of non-AERO courses in Engineering Physics, other Engineering, Math, or SCLM 511, with Advisor and Program Coordinator approval)	12
AERO 700 Graduate Thesis	9
Total Credits	21

Suggested Plans of Study

Aerodynamics and Propulsion - Non-Thesis Option

Year One

Requirements	Credits
MATH 502 - Boundary Value Problems or ENGP 501 - Numerical Methods for Engineers and Scientists	3
AERO 504 - Advanced Compressible Flow	3
AERO 508 - Intermediate Heat Transfer	3
Semester Hours	9

Requirements	Credits
AERO 521 - Viscous Flow	3
AERO 516 - Computational Aeronautical Fluid Dynamics	3
AERO 550 - Thermodynamics: Classic and Modern Perspectives	3
Semester Hours	9

Total Credits

Total Hours for All Requirements: 18

Year Two

Requirements	Credits
AERO 504 - Advanced Compressible Flow	3
AERO 610 - Advanced Computational Fluid Dynamics	3
Semester Hours	6

Requirements	Credits
AERO 512 - Combustion I	3
AERO 507 - Design, Build and Test	3
Semester Hours	6

Total Credits

Total Hours for All Requirements: 12

Aerodynamics and Propulsion - Thesis Option

Year One

Requirements	Credits
MATH 502 - Boundary Value Problems or ENGP 501 - Numerical Methods for Engineers and Scientists	3
AERO 504 - Advanced Compressible Flow	3
AERO 508 - Intermediate Heat Transfer	3
Semester Hours	9

Requirements	Credits
AERO 521 - Viscous Flow	3
AERO 516 - Computational Aeronautical Fluid Dynamics	3
AERO 700 - Graduate Thesis	3
Semester Hours	9

Total Credits

Total Hours for All Requirements: 18

Year Two

Requirements	Credits
AERO 700 - Graduate Thesis	3
AERO 610 - Advanced Computational Fluid Dynamics	3
Semester Hours	6

Requirements	Credits
AERO 512 - Combustion I	3
AERO 700 - Graduate Thesis	3
Semester Hours	6

Total Credits

Total Hours for All Requirements: 12

Structures and Materials - Non-Thesis Option

Year One

Requirements	Credits
MATH 502 - Boundary Value Problems or ENGP 501 - Numerical Methods for Engineers and Scientists	3
AERO 510 - Aircraft Structural Dynamics	3
AERO 515 - Introduction to the Finite Element Method	3
Semester Hours	9

Requirements	Credits
AERO 502 - Strength and Fatigue of Materials	3
AERO 522 - Analysis of Aircraft Composite Materials	3
AERO 525 - Structural Design Optimization	3
Semester Hours	9

Total Credits

Total Hours for All Requirements: 18

Year Two

Requirements	Credits
MECH 548 - Introduction to Continuum Mechanics	3
AERO 534 - Smart Materials in Engineering	3
Semester Hours	6

Requirements	Credits
AERO 532 - Engineering Materials and Failure Analysis	3
AERO 618 - Aeroelasticity	3
Semester Hours	6

Total Credits

Total Hours for All Requirements: 12

Structures and Materials - Thesis Option

Year One

Requirements	Credits
MATH 502 - Boundary Value Problems or ENGP 501 - Numerical Methods for Engineers and Scientists	3
AERO 510 - Aircraft Structural Dynamics	3
AERO 515 - Introduction to the Finite Element Method	3
Semester Hours	9

Requirements	Credits
AERO 502 - Strength and Fatigue of Materials	3
AERO 522 - Analysis of Aircraft Composite Materials	3
AERO 700 - Graduate Thesis	3
Semester Hours	9

Total Credits

Total Hours for All Requirements: 18

Year Two

Requirements	Credits
MECH 548 - Introduction to Continuum Mechanics	3
AERO 700 - Graduate Thesis	3
Semester Hours	6

Requirements	Credits
AERO 618 - Aeroelasticity	3
AERO 700 - Graduate Thesis	3
Semester Hours	6

Total Credits

Total Hours for All Requirements: 12

Dynamics and Control - Non-Thesis Option

Year One

Requirements	Credits
MATH 502 - Boundary Value Problems, 510 - Fundamentals of Optimization, or 532 - Numerical Linear Algebra for Engineers	3
AERO 523 - Linear Systems	3
AERO 623 - Navigation, Guidance and Control	3
Semester Hours	9

Requirements	Credits
AERO 527 - Modern Control Systems	3
AERO 506 - Airplane Dynamic Stability	3
AERO 544 - Analytical Dynamics	3
Semester Hours	9

Total Credits

Total Hours for All Requirements: 18

Year Two

Requirements	Credits
AERO 531 - Orbital Mechanics	3
AERO 633 - Optimal Control	3
Semester Hours	6

Requirements	Credits
AERO 544 - Analytical Dynamics	3
AERO 553 - Hybrid and Urban Air Mobility	3
Semester Hours	6

Total Credits

Total Hours for All Requirements: 12

Dynamics and Control - Thesis Option

Year One

Requirements	Credits
MATH 502 - Boundary Value Problems, 510 - Fundamentals of Optimization, or 532 - Numerical Linear Algebra for Engineers	3
AERO 523 - Linear Systems	3
AERO 623 - Navigation, Guidance and Control	3
Semester Hours	9

Requirements	Credits
AERO 527 - Modern Control Systems	3
AERO 506 - Airplane Dynamic Stability	3
AERO 700 - Graduate Thesis	3
Semester Hours	9

Total Credits

Total Hours for All Requirements: 18

Year Two

Requirements	Credits
AERO 633 - Optimal Control	3
AERO 700 - Graduate Thesis	3
Semester Hours	6

Requirements	Credits
AERO 544 - Analytical Dynamics	3
AERO 700 - Graduate Thesis	3
Semester Hours	6

Total Credits

Total Hours for All Requirements: 12