B.S. in Systems Engineering

The B.S. in Systems Engineering prepares students for success with sharp technical skills and introduces them to engineering processes used in aerospace and aviation. Students will engage in hands-on projects, working with small hardware and software systems used in applications that span aerospace, aviation, and other tech-forward industries.

In the Systems Engineering program on the **Daytona Beach Campus**, students will have access to the Electrical Engineering and Computer Science (EECS) Student Projects Lab, the Cybersecurity Engineering Laboratory, the Biologically Inspired Design-for-Resilience (BID4R) Lab, the EECS Capstone Design Laboratory and more, all designed to give a hands-on experience that will help students stand out from the crowd after graduation.

Program-Level Student Learning Outcomes

Students will:

- Have an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- Have an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- Have an ability to communicate effectively with a range of audiences.
- Have an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
- Have an ability to function effectively on a team whose members together provide leadership, create a collaborative environment, establish goals, plan tasks, and meet objectives.
- Have an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- Have an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Daytona Beach Program Requirements

General Education Requirements	39
Core Requirements	56
Area of Concentration	30
Total Credits	**125**

Program Details

The Bachelor of Science in Systems Engineering program requires successful completion of a minimum of 125 semester hours. The program may be completed in eight regular semesters, assuming appropriate background and full-time enrollment. Students pursuing this undergraduate degree must earn a minimum cumulative grade point average (CGPA) of 2.00 for all work completed at the University.

General Education Requirements

Communication		9
COMM 122	English Composition	
COMM 219	Speech	
COMM 221	Technical Communication	
Humanities - Lower Level		3
Social Sciences - Lower Level		3
PSYC 101	Introduction to Psychology	
Humanities/Social Sciences - Lower or Upper Level		3
Humanities/Social Sciences - Upper Level		3
Computer Science/Information Technology		3
Aerospace AOC		
ENGR 115	Introduction to Computing for Engineers	
Enterprise AOC		
CPSC 223	Scientific Programming in C	
Mathematics		8
MATH 241	Calculus and Analytical Geometry I	
MATH 242	Calculus and Analytical Geometry II	
Physical/Life Sciences		7
PHYS 150	Physics with Calculus I	
PHYS 160	Physics with Calculus II	
PHYS 226L	Physics I Laboratory	
Total Credits		**39**

Core Requirements

ENGR 101	Introduction to Engineering	2
ESCI 201	Statics	3
ESCI 204	Dynamics	3
HFCT 300	Human Factors Principles and Fundamentals	3
HFCT 312	Ergonomics and Bioengineering	3
MATH 243	Calculus and Analytical Geometry III	4
MATH 345	Differential Equations and Matrix Methods	4
MATH 412	Probability and Statistics	3
SYSE 301	Introduction to Systems Engineering	3
SYSE 302	System Engineering Design Considerations	3
SYSE 303	Optimization in Systems Engineering	3
SYSE 304	Trade Studies, Risk and Decision Analysis	3
SYSE 401	Systems Modeling and Simulation	3
SYSE 402	Optimization in Systems Engineering II	3
SYSE 403	Systems Engineering Life Cycle Costing	3
SYSE 415	Systems Engineering Practices: Specialty Engineering	3
SYSE 490	Systems Engineering Capstone Project I	3
SYSE 491	Systems Engineering Capstone Project II	3
UNIV 101	College Success	1
Total Credits		**56**

Area of Concentration

Aerospace Systems Engineering Area of Concentration

AERO 201	Aerospace Flight Vehicles	3
ELEC 311	Robotics and Autonomous Systems I	3
ELEC 327	Electrical Engineering Fundamentals	3
ELEC 327L	Electrical Engineering Fundamentals Laboratory	1
ELEC 401	Control Systems Analysis and Design	3
ELEC 401L	Control Systems Laboratory	1
ENGR 120	Graphical Communications	3
ESCI 208	Thermodynamics	3
Choose One of the Following:		3
AERO 313	Space Mechanics	
AERO 319	Aerodynamics for Engineers	
AERO 323	Spacecraft Systems	

Technical Electives

Technical Elective - Science + Lab	4
Examples: BIOL 120 and BIOL 120L / CHEM 110 and CHEM 110L / PHYS 228 and PHYS 228L / PHYS 250 and PHYS 250L	
Technical Elective	3
AERO/CESC/CIVE/CPSC/ELEC/MECH/SFTW/SYSE Upper-Level Elective	
Total Credits	**30**

Enterprise Systems Engineering Area of Concentration

CESC 220	Digital Circuit Design	3
CESC 220L	Digital Circuit Design Laboratory	1
CESC 320	Microprocessor Systems	3
CESC 320L	Microprocessor Systems Laboratory	1
Choose Four of the Following:		12
SYSE 310	Systems Architecture Modeling	
SYSE 330	Professional Standards for Systems Engineers	
SYSE 405	Aerospace Systems Guidance and Control	
SYSE 410	Space Systems and Mission Analysis	
SYSE 425	System Quality Engineering	
SYSE 460	Systems Engineering Management	

Technical Electives

Technical Elective - Science + Lab	4
Examples: BIOL 120 and BIOL 120L / CHEM 110 and CHEM 110L / PHYS 228 and PHYS 228L / PHYS 250 and PHYS 250L	
Technical Electives	6
AERO/CESC/CIVE/CPSC/ELEC/MECH/SFTW/SYSE Upper-Level Elective	
Total Credits	**30**

Suggested Plan of Study

Aerospace Systems Engineering Area of Concentration

Year One

Requirements	Credits
PSYC 101 - Introduction to Psychology	3
COMM 122 - English Composition	3
ENGR 101 - Introduction to Engineering	2
ENGR 120 - Graphical Communications	3
MATH 241 - Calculus and Analytical Geometry I	4
UNIV 101 - College Success	1
Semester Hours	**16**

Requirements	Credits
ENGR 115 - Introduction to Computing for Engineers	3
MATH 242 - Calculus and Analytical Geometry II	4
PHYS 150 - Physics with Calculus I	3
COMM 219 - Speech	3
Humanities - Lower Level (140 Series)	3
Semester Hours	**16**

Total Credits

Total Hours for All Requirements: 32

Year Two

Requirements	Credits
ESCI 201 - Statics	3
PHYS 160 - Physics with Calculus II	3
MATH 243 - Calculus and Analytical Geometry III	4
COMM 221 - Technical Communication	3
Humanities/Social Sciences - Lower or Upper Level	3
Semester Hours	**16**

Requirements	Credits
AERO 201 - Aerospace Flight Vehicles	3
AERO 313 - Space Mechanics, 319 - Aerodynamics for Engineers, or 323 - Spacecraft Systems	3
ESCI 204 - Dynamics	3
MATH 345 - Differential Equations and Matrix Methods	4
HFCT 300 - Principles and Fundamentals	3
Semester Hours	**16**

Total Credits

Total Hours for All Requirements: 32

Year Three

Requirements	Credits
HFCT 312 - Ergonomics and Bioengineering	3
SYSE 301 - Introduction to Systems Engineering	3
SYSE 304 - Trade Studies, Risk and Decision Analysis	3
MATH 412 - Probability and Statistics	3
ELEC 327 - Electrical Engineering Fundamentals	3
ELEC 327L - Electrical Engineering Fundamentals Laboratory	1
Semester Hours	**16**

Requirements	Credits
SYSE 302 - System Engineering Design Considerations	3
SYSE 303 - Optimization in Systems Engineering	3
SYSE 415 - Systems Engineering Practices: Specialty Engineering	3
SYSE 403 - Systems Engineering Life Cycle Costing	3
ELEC 311 - Robotics and Autonomous Systems I	3

PHYS 226L - Physics I Laboratory	1
Semester Hours	**16**

Total Credits

Total Hours for All Requirements: 32

Year Four

Requirements	Credits
SYSE 401 - Systems Modeling and Simulation	3
SYSE 402 - Optimization in Systems Engineering II	3
SYSE 490 - Systems Engineering Capstone Project I	3
Humanities/Social Sciences - Upper Level	3
Technical Elective - Science + Lab (Examples: BIOL 120 and BIOL 120L / CHEM 110 and CHEM 110L / PHYS 228 and PHYS 228L / PHYS 250 and PHYS 250L)	4
Semester Hours	**16**

Requirements	Credits
SYSE 491 - Systems Engineering Capstone Project II	3
ELEC 401 - Control Systems Analysis and Design	3
ELEC 401L - Control Systems Laboratory	1
ESCI 208 - Thermodynamics	3
Technical Elective (AERO/CESC/CIVE/CPSC/ELEC/MECH/SFTW/SYSE Upper-Level Elective)	3
Semester Hours	**13**

Total Credits

Total Hours for All Requirements: 29

Enterprise Area of Concentration

Year One

Requirements	Credits
PSYC 101 - Introduction to Psychology	3
COMM 122 - English Composition	3
ENGR 101 - Introduction to Engineering	2
MATH 241 - Calculus and Analytical Geometry I	4
UNIV 101 - College Success	1
Humanities/Social Sciences - Lower Level	3
Semester Hours	**16**

Requirements	Credits
COMM 219 - Speech	3
MATH 242 - Calculus and Analytical Geometry II	4
CPSC 223 - Scientific Programming in C	3
PHYS 150 - Physics with Calculus I	3
Humanities - Lower Level (140 Series)	3
Semester Hours	**16**

Total Credits

Total Hours for All Requirements: 32

Year Two

Requirements	Credits
PHYS 160 - Physics with Calculus II	3
ESCI 201 - Statics	3
MATH 243 - Calculus and Analytical Geometry III	4
COMM 221 - Technical Communication	3
CESC 220 - Digital Circuit Design	3
CESC 220L - Digital Circuit Design Laboratory	1
Semester Hours	**17**

Requirements	Credits
CESC 320 - Microprocessor Systems	3
CESC 320L - Microprocessor Systems Laboratory	1
HFCT 300 - Principles and Fundamentals	3
MATH 345 - Differential Equations and Matrix Methods	4
ESCI 204 - Dynamics	3
PHYS 226L - Physics I Laboratory	1
Semester Hours	**15**

Total Credits

Total Hours for All Requirements: 32

Year Three

Requirements	Credits
HFCT 312 - Ergonomics and Bioengineering	3
SYSE 301 - Introduction to Systems Engineering	3
SYSE 304 - Trade Studies, Risk and Decision Analysis	3
MATH 412 - Probability and Statistics	3
Humanities/Social Sciences - Upper Level	3
Semester Hours	**15**

Requirements	Credits
SYSE 302 - System Engineering Design Considerations	3
SYSE 303 - Optimization in Systems Engineering	3
SYSE 403 - Systems Engineering Life Cycle Costing	3
SYSE* Technical Elective - 300/400-Level	3
Technical Elective (AERO/CESC/CIVE/CPSC/ELEC/MECH/SFTW/SYSE Upper-Level Elective)	3
Semester Hours	**15**

Total Credits

Total Hours for All Requirements: 30

Year Four

Requirements	Credits
SYSE 401 - Systems Modeling and Simulation	3
SYSE 402 - Optimization in Systems Engineering II	3
SYSE 490 - Systems Engineering Capstone Project I	3
SYSE Technical Elective - 300/400-Level*	3
Technical Elective - Science + Lab (Examples: BIOL 120 and BIOL 120L / CHEM 110 and CHEM 110L / PHYS 228 and PHYS 228L / PHYS 250 and PHYS 250L)	4
Semester Hours	**16**

Requirements	Credits
SYSE 491 - Systems Engineering Capstone Project II	3
SYSE 415 - Systems Engineering Practices: Specialty Engineering	3
SYSE Technical Elective - 400-Level*	3
SYSE Technical Elective - 400-Level*	3
Technical Elective (AERO/CESC/CIVE/CPSC/ELEC/MECH/SFTW/SYSE Upper-Level Elective)	3
Semester Hours	**15**

Total Credits

Total Hours for All Requirements: 31

* Pick from one of the following courses to fulfil the SYSE Technical Elective Requirement: SYSE 310, SYSE 330, SYSE 405, SYSE 410, SYSE 425, SYSE 460