PH.D. IN SYSTEMS ENGINEERING

The Ph.D. in Systems Engineering prepares students to become leaders in systems engineering. Students will produce original research that drives advancements and leads to improvements in areas such as energy efficiency, environmental impact, cybersecurity, economic growth, and more. Students will become fluent in the theoretical and technical complexities of interdisciplinary modern engineering and complete the program with the credentials to teach at the highest collegiate levels. Choose from more than 40 course options, and attend online, in-person, or hybrid.

Learning Objectives

Upon successful completion, students will be able to:

1. Effectively analyze, design, or implement integrated system solutions.
2. Effectively use and create systems engineering tools such as modeling and simulation of a system.
3. Evaluate systems interfaces between stakeholder and technical domains effectively and efficiently.
4. Exemplify a variety of roles in multi-disciplinary teams including systems engineer, technical expert, and leader, product owner, upper management.
5. Contribute technically to the systems engineering field of knowledge.

Requirements Effective Fall 2025

Code	Title	Credits
SYSE 701	Research Methods in Systems Engineering	3
Courses in Depth - Select 21 credits:		**21**
ENGR 502	Engineering Project and Program Management	
or CIS 600A	Project Management: Information Technology	
or CIS 670	Advanced IT Project Management	
ENGR 510	Engineering Optimization: Method/ Application	
ENGR 520	Intelligent Decision Support Systems	
ENGR 525	Intellectual Property and Invention Systems	
ENGR 531	Engineering Risk Analysis	
ENGR 533	Spaceflight and Biological Systems	
ENGR 535	Modeling Human Systems Behavior	
ENGR 540	Design Analysis of Engineering Experiments	
ENGR 546	AR/VR Biometrics and Sensing for Training	
ENGR 565/ ECE 565	Electrical Power Engineering	
ENGR 570	Coupled Electromechanical Systems	
MECH 513	Simulation Modeling and Experimentation	
ECE 566	Grid Integration of Wind Energy Systems	
SYSE 501	Foundations of Systems Engineering	
SYSE 505	Systems Thinking for the Real World	
SYSE 511	Control Engineering for System Engineers	
SYSE 512	Systems Sensing and Imaging Analysis	
SYSE 530	Overview of Systems Engineering Processes	
SYSE 532/ ECE 532	Dynamics of Complex Engineering Systems	
SYSE 534	Human Systems Integration	
SYSE 536	Space Mission Analysis and Design	
SYSE 541	Engineering Data Design and Visualization	
SYSE 544	Systems-Based AR/VR Environmental Realism	
SYSE 545	Augmented/Virtual Reality Systems Development	
SYSE 548	Security Engineering for Systems Engineers	
SYSE 549	Secure Vehicle and Industrial Networking	
SYSE 555	Transitions in Energy Systems	
SYSE 567	Systems Engineering Architecture	
SYSE 569	Cybersecurity Awareness for Systems Engineers	
SYSE 571	Analytics in Systems Engineering	
SYSE 573	Cost Optimization for Systems Engineers	
SYSE 602	Systems Requirements Engineering	
SYSE 603	Introduction to Systems Test and Evaluation	
SYSE 667	Advanced Model-Based Systems Engineering	
Technical Electives [1]		**18**
Dissertation		
SYSE 799A	Dissertation: PhD [2]	30
Program Total Credits:		**72**

A minimum of 72 credits are required to complete this program. Up to 30 credits of an applicable master's degree may be used toward Technical Elective, Courses in Depth, and Dissertation requirements.

1 Select technical elective credits with approval by student's advisor. SE Department maintains an extensive list of possible suggested electives, or new courses may be approved on an individual basis. A maximum of 6 credit hours are permitted at the 400-level. The remainder must be at the 500-level or above.

2 3 credit hours of SYSE 795 may be used by students who have had their Ph.D. research, performed while enrolled at CSU, accepted for publication (completely or with minor revisions) in at least two peer-reviewed journal or conference publications. Contact department for details.

Requirements for All Graduate Degrees

For more information, please visit Requirements for All Graduate Degrees (https://catalog.colostate.edu/general-catalog/graduate-bulletin/graduate-study/procedures-requirements-all-degrees/) in the Graduate and Professional Bulletin (https://catalog.colostate.edu/general-catalog/graduate-bulletin/).

Summary of Procedures for the Master's and Doctoral Degrees

NOTE: Each semester the Graduate School publishes a schedule of deadlines. Deadlines are available on the Graduate School website (https://graduateschool.colostate.edu/deadline-dates/). Students should consult this schedule whenever they approach important steps in their careers.

Forms (https://graduateschool.colostate.edu/forms/) are available online.

Step	Due Date
1. Application for admission (online)	Six months before first registration
2. Diagnostic examination when required	Before first registration
3. Appointment of advisor	Before first registration
4. Selection of graduate committee	Before the time of fourth regular semester registration
5. Filing of program of study (GS Form 6)	Before the time of fourth regular semester registration
6. Preliminary examination (Ph.D. and PD)	Two terms prior to final examination
7. Report of preliminary examination (GS Form 16) - (Ph.D. and PD)	Within two working days after results are known
8. Changes in committee (GS Form 9A)	When change is made
9. Application for Graduation (GS Form 25)	Refer to published deadlines from the Graduate School Website
9a. Reapplication for Graduation (online)	Failure to graduate requires Reapplication for Graduation (online) for the next time term for which you are applying
10. Submit thesis or dissertation to committee	At least two weeks prior to the examination or at the discretion of the graduate committee
11. Final examination	Refer to published deadlines from the Graduate School Website
12. Report of final examination (GS Form 24)	Within two working days after results are known; refer to published deadlines from the Graduate School website
13. Submit a signed Thesis/ Dissertation Submission Form (GS Form 30) to the Graduate School and Submit the Survey of Earned Doctorates (Ph.D. only) prior to submitting the electronic thesis/ dissertation	Refer to published deadlines from the Graduate School website.
14. Submit the thesis/dissertation electronically	Refer to published deadlines from the Graduate School website
15. Graduation	Ceremony information is available from the Graduate School website