Overview
Discover how to develop systems strategies that can be applied to any industry. Colorado State University’s online systems engineering degrees prepare you with immediately applicable skills that can help solve current challenges your company may be facing.

Taking a systems approach in the curriculum development itself, more than 600 industry and government leaders were surveyed to help shape our unique and innovative program with a systems engineering specialization. As a result, these degrees feature systems engineering courses that cover critical topics such as risk analysis, project management, support systems, and systems engineering processes.

You’ll learn from faculty who bring decades of experience in applying academic research to real-world situations, and are conducting cutting-edge research that will help write the textbooks of tomorrow.

Additionally, the systems engineering master’s program offers the advantage of a hybrid course delivery strategy. This option allows you to study when and where it works best for you, whether that be:
- Online while the lecture is happening live on campus
- Watching a recorded version sometime after work or on the weekend
- Attending a selection of courses in person at the Fort Collins campus or our South Metro Denver location

Delivery
Online; select courses have in-person attendance options

Credits
30 credits

Tuition
$1,035 per credit
Financial aid is available

Time Frame
Varies based on intensity of study and previous coursework

Degree Awarded
Master of Science (M.S.) in Systems Engineering

Offered By
The College of Engineering

Learn More
online.colostate.edu/degrees/systems-engineering

Transforming today’s electric power system into an intelligent network capable of generating, distributing, and consuming power anywhere within the system based on clean energy sources, realtime information, and market-driven transactions is a daunting engineering task. Colorado State University’s Systems Engineering program addresses the challenges of designing and building such complex engineered systems.

Dr. Sunil Cherian
President and CEO, Spirae, Inc.
Minimum Admission Requirements

- B.S. degree from a regionally-accredited institution in engineering, mathematics, or a science discipline with a GPA of 3.0 or greater
- Calculus III (MATH 261 Calculus for Physical Scientists III or equivalent)
- Basic Statistics
- GRE test scores are required if all previous degrees were conferred by an institution outside of the U.S.
- M.S. Plan A (thesis required) – 21 hours coursework with 9 credit hours of thesis work
- M.S. Plan B (project required) – 27 hours of coursework with 3 credit hours of project work
- For Plan A, a faculty advisor must be secured before admission to the program (the Systems staff will review application materials to determine faculty alignment). It is also the responsibility of the applicant to establish rapport with faculty in a professional manner once all application materials have been submitted.

Completion Requirements

- Minimum of 30 credits of graduate work in approved program of study.
- Minimum of 24 credits must be earned at Colorado State University, 21 of which credits at the 500-level must be earned after formal admission to the University.
- No more than two courses at the 400 level taken at Colorado State University are permitted.
- No more than two 500-level or higher graduate courses may be transferred from another accredited university.
- Electives or course substitutions must be approved by an academic advisor.

Plan A only
- Electives or course substitutions must be approved by an academic advisor.

Plan B only
- 15 credits must be core courses, 12 credits of technical electives, and 3 credits of independent study (ENGR 695), or a comparable course with a minimum of 3 credits with approval of graduate advisor.

Curriculum

Core courses (15 credits)
- ENGR 501 – Foundations of Systems Engineering (3 cr.)
- ENGR 530 – Overview of Systems Engineering Processes (3 cr.)
- ENGR 531 – Engineering Risk Analysis (3 cr.)
- ENGR 567 – Systems Engineering Architecture (3 cr.)
- ENGR 565 – Electrical Power Engineering (3 cr.)
- ECE 566 – Energy Conversion for Electrical Power Systems (3 cr.)
- ENGR 510 – Engineering Optimization: Method/Application (3 cr.)
- ENGR 520 – Engineering Decision Support/Expert Systems (3 cr.)
- ENGR 532 – Dynamics of Complex Engineering Systems (3 cr.)
- MECH 513 – Simulation Modeling and Experimentation (3 cr.)
- CIS 600 – Information Technology and Project Management (3 cr.)
- ENGR 620 – Power Electronics I (3 cr.)
- ECE 612 – Robust Control Systems (3 cr.)
- ECE 622 – Energy Networks and Power Distribution Grids (3 cr.)
- ECE 623 – Electric Power Quality (3 cr.)
- ECE 658 – Internet Engineering (4 cr.)
- MECH 609 – Experimental Optimization (3 cr.)

Technical Electives (6 or 12 credits)
These credits can span a broad number of technical electives. Examples include:
- ECE 452 – Computer Organization and Architecture (3 cr.)
- ECE 456 – Computer Networks (4 cr.)
- ECE 508 – Introduction to Power System Markets (3 cr.)
- ECE 509 – Signal Processing for Power Systems (3 cr.)
- ECE 512 – Digital Signal Processing (3 cr.)
- ECE 554 – Computer Architecture (3 cr.)
- ECE 561 – Hardware/Software Design of Embedded Systems (4 cr.)
- ECE 562 – Power Electronics I (3 cr.)
- ECE 612 – Robust Control Systems (3 cr.)
- ECE 622 – Energy Networks and Power Distribution Grids (3 cr.)
- ECE 623 – Electric Power Quality (3 cr.)
- ECE 658 – Internet Engineering (4 cr.)
- MECH 609 – Experimental Optimization (3 cr.)

A maximum of 6 credit hours at the 400 level is permitted. The remaining credits must be at the 500 level or above. For a listing of technical electives, contact the systems engineering advisor sys_engr_info@engr.colostate.edu. Additionally, any course from the core courses list, if not taken as part of your required 15 core credits, can be taken as a technical elective option.

Thesis (Plan A students only)
- ENGR 699 – Thesis (9 cr.)

Independent study (Plan B students only)
- ENGR 695 – Independent Study (3 cr.)