

# SYSTEMS ENGINEERING (GRADUATE FIELD)

Program Website (<https://www.engineering.cornell.edu/sys/>)

## Field Description

Contemporary challenges are marked by a level of systemic complexity that defies narrow, discipline-specific interpretation. When problems are examined solely through isolated disciplinary lenses, knowledge becomes fragmented even though the real world functions as an integrated whole. Applying such partial insights to multifaceted contexts invites unintended consequences. Classical analytic approaches — rooted in reductionism and linear causality — prove inadequate for capturing the nonlinear feedback loops, emergent behaviors, and adaptive dynamics that characterize modern systems. Accordingly, Systems Engineering has emerged as a research field committed to cultivating holistic understanding grounded in interconnectedness — perspectives inaccessible from any single specialty. Researchers in the Systems Engineering field strive to collaborate across diverse technical and social domains, cocreating and advancing integrative methodologies and rigorous inquiry capable of illuminating complex phenomena and informing robust solutions to technological and societal challenges.

## Data and Statistics

- Doctoral Program Statistics (<https://gradschool.cornell.edu/about/program-metrics-assessments-and-outcomes/doctoral-program-statistics/?SelectGradField=19>)

## Field Manual

- Manual (<https://www.engineering.cornell.edu/sys/systems-phd/>)

## Subject and Degrees

### Systems

- Systems (M.S.) (<https://catalog.cornell.edu/programs/systems-ms/>)(Ithaca)
- Systems (Ph.D.) (<https://catalog.cornell.edu/programs/systems-phd/>)(Ithaca)

### Systems Engineering

- Systems Engineering (M.Eng.) (<https://catalog.cornell.edu/programs/systems-engineering-meng/>)(Distance, Online, Low-residency, or Hybrid option)
- Systems Engineering (M.Eng.) (<https://catalog.cornell.edu/programs/systems-engineering-meng/>)(Ithaca)

## Concentrations by Subject

### Systems

- Systems Engineering (*minor*)
- Systems Engineering

### Systems Engineering

- systems engineering (*minor*)

## Faculty

C. Lindsay Anderson (<http://cals.cornell.edu/c-lindsay-anderson/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering:* systems engineering; *Systems:* Systems Engineering; Systems Engineering

Kenneth Paul Birman (<http://www.cs.cornell.edu/ken/>)

- **Campus:** Cornell ILR NYC
- **Concentrations:** *Systems Engineering:* systems engineering; *Systems:* Systems Engineering

Mark Campbell (<http://www.engineering.cornell.edu/faculty-directory/mark-campbell/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering:* systems engineering; *Systems:* Systems Engineering
- **Research Interests:** space systems; estimation and control; autonomy in aerospace systems; controlled structures

Michael Timothy Charles (<http://cals.cornell.edu/michael-charles/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems:* Systems Engineering
- **Research Interests:** system dynamic modeling, techno-ecological system design, sustainable engineering, community-based design

Ricardo Alvarez Daziano (<http://www.cee.cornell.edu/faculty-directory/ricardo-daziano/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering:* systems engineering; *Systems:* Systems Engineering
- **Research Interests:** incentives and adoption of renewable energy sources

Timur Kamil Dogan (<http://aap.cornell.edu/people/timur-dogan/?department=8>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering:* systems engineering; *Systems:* Systems Engineering
- **Research Interests:** daylighting, energy modeling, passive climate control strategies, and performance driven design workflows in both urban and architectural scale

Christopher J. Earls (<http://www.cee.cornell.edu/faculty-directory/christopher-j-earls/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering:* systems engineering; *Systems:* Systems Engineering
- **Research Interests:** Artificial Intelligence

Gregory Joseph Falco (<http://www.engineering.cornell.edu/faculty-directory/gregory-falco/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering:* systems engineering
- **Research Interests:** The Aerospace ADVERSARY breaks things in order to redefine how they work. We take big risks and fail fast. We are interested in pioneering new space architectures that will guide the aerospace sector towards fundamentally new space technology. The lab is particularly interested in developing national security

offensive and defensive technical capabilities for space systems and understanding their ethical and policy implications.

Stefano Galelli (<http://galelli.cee.cornell.edu/people/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering
- **Research Interests:** Dr. Galelli's research interests lie on the interactions between critical infrastructure systems and the natural environment. In particular, Dr. Galelli is interested in (1) characterizing how hydro-climatic variability cascades across interconnected water-energy infrastructures and (2) providing adaptive, robust, and scalable management solutions that balance reliability, resilience, and sustainability. To reach this goal, his lab advances and combines elements of process-based modelling, climatology, statistical learning, control theory, and optimization. More details can be found on the Critical Infrastructure Systems Lab website linked below.

H. Oliver Gao (<http://www.engineering.cornell.edu/faculty-directory/h-oliver-gao/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems: Systems Engineering*
- **Research Interests:** systems engineering

Raymond Richard Geddes (<http://www.human.cornell.edu/people/rrg24/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems: Systems Engineering*; *Systems Engineering*
- **Research Interests:** research studies policies focused on the delivery of infrastructure projects in the transportation, water and energy sectors

Allison Godwin (<http://www.cheme.cornell.edu/faculty-directory/allison-godwin/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering
- **Research Interests:** Allison Godwin's research focuses on changing the culture of engineering through research to make the discipline more inclusive of all types of people from K-12 through higher education and into engineering industry. She investigates how diverse people develop identities as engineers and how their multiple identities—including gender, race/ethnicity, among others—impact their inclusion, recruitment, persistence, and career trajectories. Identity in a particular role, like engineering, emphasizes that how students make sense of what it means to be a professional within their field can reveal information about how they understand who they are in the world, whom they can become, and if they belong. She conducts mixed methods research, which includes large-scale quantitative studies and “small n” qualitative studies through surveys, interventions, interviews, focus groups, and other data collection techniques. Using both of these data streams provides the ability to understand general trends as well as rich and nuanced findings from individual's lived experiences. Professor Godwin has developed and tested effective pedagogies in an introductory chemical engineering course to reduce high failure rates and strengthen students' motivation. This work has had direct impact on student retention and success rates at Purdue University. She is studying how low-cost, low-effort classroom interventions can address equity gaps in

academic performance in first and second-year engineering courses. Professor Godwin has also worked with emerging engineering education scholars to promote engineering education development in methods, publications, and CAREER grant applications.

David Alan Goldberg (<http://www.orie.cornell.edu/faculty-directory/david-alan-goldberg/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems: Systems Engineering*

Jillian L Goldfarb (<http://cals.cornell.edu/jillian-goldfarb/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems: Systems Engineering*
- **Research Interests:** Sustainable energy, Integration of lab data, Public policy and Computational models

Miguel I. Gomez (<http://dyson.cornell.edu/people/profiles/gomez.php>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems: Systems Engineering*
- **Research Interests:** sustainable food systems; marketing and food distribution

Maha Haji (<http://sea.mae.cornell.edu/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems: Systems Engineering*; *Systems Engineering*

Felix Korbinian Heisel (<http://aap.cornell.edu/people/felix-heisel/?department=8>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems: Systems Engineering*
- **Research Interests:** Arch. Design

Shane G. Henderson (<http://www.orie.cornell.edu/faculty-directory/shane-g-henderson/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems: Systems Engineering*
- **Research Interests:** discrete-event simulation; simulation optimization with applications in emergency services

Mark E. Lewis (<http://www.orie.cornell.edu/faculty-directory/mark-e-lewis/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems: Systems Engineering*
- **Research Interests:** optimization and stochastic control in queueing and production problems, emergency healthcare systems

Adrian Lewis (<http://www.orie.cornell.edu/faculty-directory/adrian-s-lewis/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems*: Systems Engineering; Systems Engineering
- **Research Interests:** algorithms; optimization

Andreas Malikopoulos (<http://www.cee.cornell.edu/faculty-directory/andreas-malikopoulos/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems*: Systems Engineering; Systems Engineering
- **Research Interests:** My research interests span several areas, including analysis, optimization, and control of cyber-physical systems; decentralized stochastic systems; stochastic scheduling and resource allocation; and learning in complex systems.

Jose Martinez (<https://www.engineering.cornell.edu/people/jose-f-martinez/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems*: Systems Engineering; Systems Engineering
- **Research Interests:** reconfigure and self-optimizing architecture, architectural impact of disruptive technologies (e.g., on-chip nano photonics), and hardware-software interaction

Jacob Paul Mays (<http://www.cee.cornell.edu/faculty-directory/jacob-mays/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems*: Systems Engineering
- **Research Interests:** Industrial Engineering, Energy Systems

Andreea Minca (<http://www.orie.cornell.edu/faculty-directory/andreea-c-minca/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems*: Systems Engineering
- **Research Interests:** Financial & Economic Network Analytics and Clustering Algorithms

Andrew C Myers (<http://www.engineering.cornell.edu/faculty-directory/andrew-c-myers/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems*: Systems Engineering
- **Research Interests:** computer security; software engineering

Linda K Nozick (<http://www.cee.cornell.edu/faculty-directory/linda-k-nozick/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems*: Systems Engineering; Systems Engineering
- **Research Interests:** math modeling of complex systems; transportation; project planning and scheduling

Francesca Parise (<http://www.engineering.cornell.edu/faculty-directory/francesca-parise/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems*: Systems Engineering
- **Research Interests:** Complex Systems, Network Science and Computation, Analysis and Control

Mason A. Peck (<http://www.mae.cornell.edu/faculty-directory/mason-peck/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems*: Systems Engineering
- **Research Interests:** systems engineering; space technology; dynamics, control, and estimation; attitude determination and kinematics; robotics

Jamol J. Pender (<http://www.orie.cornell.edu/faculty-directory/jamol-j-pender/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems*: Systems Engineering
- **Research Interests:** non-stationary queues; non-stationary Markov processes; financial engineering

Kirstin Hagelskjaer Petersen (<http://www.ece.cornell.edu/faculty-directory/kirstin-hagelskjaer-petersen/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems*: Systems Engineering
- **Research Interests:** AI, Bio-inspired robotics

Patrick M. Reed (<http://www.cee.cornell.edu/faculty-directory/patrick-michael-reed/>)

- **Campus:** Ithaca - (Minor Member)
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems*: Systems Engineering

Peter M. Rich (<http://peter-rich.com/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems*: Systems Engineering

Samitha Samaranayake (<http://cee.cornell.edu/samitha/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems*: Systems Engineering
- **Research Interests:** analysis and control of networked cyber-physical systems; urban transportation systems; urban infrastructure

Timothy Sands (<http://www.mae.cornell.edu/faculty-directory/timothy-sands/>)

- **Campus:** Ithaca - (Divisional Member)
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems*: Systems Engineering
- **Research Interests:** Adaptive systems; learning systems; autonomous systems; undersea systems; defense space systems;

flexible space robotics; estimation and control; spacecraft engineering

Fred Barry Schneider (<http://infosci.cornell.edu/content/schneider/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering
- **Research Interests:** distributed systems security and fault-tolerance; operating systems

Bart Selman (<http://www.cs.cornell.edu/selman/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems Engineering*
- **Research Interests:** computer science; artificial intelligence

Robert Shepherd (<http://www.mae.cornell.edu/faculty-directory/robert-f-shepherd/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems Engineering*; *Systems Engineering*

Semida Silveira (<http://www.systemseng.cornell.edu/faculty-directory/semida-silveira/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems Engineering*
- **Research Interests:** energy systems planning, energy transition, energy for sustainable development

Vivek Srikrishnan (<http://cals.cornell.edu/vivek-srikrishnan/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems Engineering*
- **Research Interests:** climate risk management, at the interface of systems engineering, climate dynamics, economics, data science, and decision science

Alexandra Coso Strong (<http://www.cheme.cornell.edu/faculty-directory/alexandra-coso-strong/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: Systems Engineering
- **Research Interests:** Engineering Education, Complex Systems, Network Sciences, and Computation.

Charlle Lee Sy (<http://www.engineering.cornell.edu/people/charlle-sy/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: Systems Engineering
- **Research Interests:** Robust Optimization, Systems Thinking, and Environmental Sustainability

Jefferson W. Tester (<http://www.cheme.cornell.edu/faculty-directory/jefferson-w-tester/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems Engineering*; *Systems Engineering*
- **Research Interests:** energy systems

Lang Tong (<http://www.ece.cornell.edu/faculty-directory/lang-tong/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems Engineering*; *Systems Engineering*
- **Research Interests:** statistical inference, decisions and signal processing, future power energy systems and smart grids, information security, wireless communications and information theory

Huseyin Topaloglu (<http://www.orie.cornell.edu/faculty-directory/huseyin-topaloglu/>)

- **Campus:** Cornell Tech (NYC)
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems Engineering*
- **Research Interests:** transportation logistics; supply chain management; large scale optimization; approximate dynamic programming

Hakim Weatherspoon (<http://www.engineering.cornell.edu/faculty-directory/hakim-weatherspoon/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems Engineering*
- **Research Interests:** Information systems

Clifford Alan Whitcomb (<http://www.systemseng.cornell.edu/faculty-directory/clifford-whitcomb/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems Engineering*; *Systems Engineering*
- **Research Interests:** Complex Engineered Systems, Transdisciplinary System-of-Systems

Fengqi You (<http://www.atkinson.cornell.edu/about/people/fellows/view.php?NetID=fy86>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems Engineering*

Rana Sagha Zadeh (<http://www.human.cornell.edu/people/rs952/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems Engineering*; *Systems Engineering*
- **Research Interests:** healthcare design; evidence-based design; sustainability; design innovation

Yiye Zhang (<http://gradschool.weill.cornell.edu/faculty/yiye-zhang/>)

- **Campus:** Ithaca
- **Concentrations:** *Systems Engineering*: systems engineering; *Systems*: Systems Engineering
- **Research Interests:** learning health systems