



The Systems Engineering program is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>

Applies engineering principles to understand **real-world problems**

Prepares cadets for the everyday challenges faced by **Army officers**

Provides the foundation for a wide spectrum of **graduate degrees**

## AIAD Program

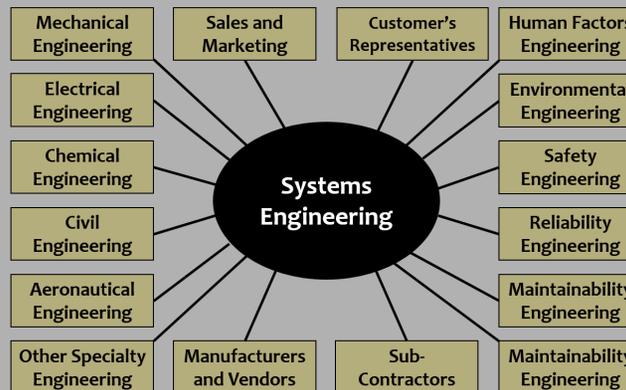
In 2019, 44 sponsors provided 63 CONUS and 6 OCONUS opportunities in DoD and private organizations. Cadets spend 3 weeks applying the Systems Decision Process and other SE fundamentals to real-world problems and return to USMA more adaptable, agile, and inspired to continue their academic work.

## Systems Engineering Major Summary

Students learn a wide variety of methods and tools used to model and analyze systems. These include:

- ◆ **Simulation Modeling:** represents a system in a computer environment to gain insight.
- ◆ **Optimization Modeling:** searches for the best possible solution given a set of specified constraints.
- ◆ **Stochastic Modeling:** handles the uncertainty of information in order to inform the system outcome risks.
- ◆ **Project Management:** a structured process to plan, organize, lead, control resources, and execute tasks to achieve specified goals.
- ◆ **Decision Modeling:** decision models that are a composite perspective of several stakeholders with multiple, competing objectives for complex, high stake decisions with uncertain information.
- ◆ **System Design:** design and engineer a solution to complex problems from concept development and detailed design to system validation and implementation.

The major culminates with an integrative **Capstone** experience working for a real-world client developing a system solution to a complex problem.

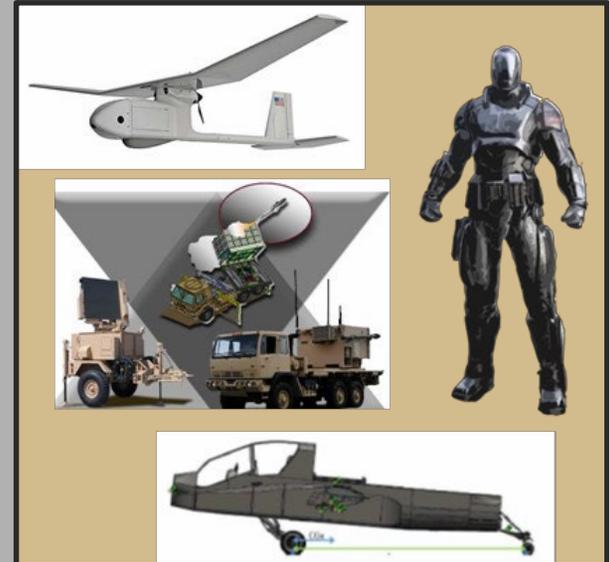


\*incose.org

"I think that Systems Engineering is USMA's secret business degree. If you look at the heavy dose of statistics, decision making, queuing, and other problem solving classes we get, these are great spring boards for the top MBA programs and five years of leading troops in the Army in any Branch"

## SYSTEMS ENGINEERING

We are the Army's Systems Engineering Department educating cadets and developing faculty to lead teams that develop and implement high value solutions to challenging problems in a dynamic, uncertain, and technologically complex world.



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### SYSTEMS ENGINEERING

Systems engineering is an interdisciplinary field of engineering that focuses on designing and managing complex systems over their life-cycles. Systems engineers integrate several domain specific engineering disciplines into a team effort forming a structured development process that proceeds from concept to design to production and to operation. Everything around us is a system composed of elements that interact with other components and the external environment in order to achieve a specified purpose. These systems may be a Soldier system with multiple integrated technologies or a complex system of systems involving multiple services, technological platforms, organizations, processes, and complex environments. Systems engineers are in high demand within the Department of Defense and industry due to the rapid spread of advanced technologies and the emergence of a highly networked, globally-oriented information age that drastically increased the complexity of our current and future environment.

A Systems Engineering Major provides the foundation to obtain three highly regarded professional certifications. Within five years of graduation you can apply for the Professional Industrial Engineer License, the Project Management Professional certification, and the Associate or Certified Systems Engineering Professional certifications.



Technologies are rapidly evolving to meet the demands of a complex world.

Systems Engineers must integrate these individual technologies into a cohesive solidier system that can operate in a system of systems within the Army's Operating Concept.

The U.S. Army Operating Concept "Win in a Complex World" states that our advantage over enemies depends highly on our advanced technologies. The Army achieves overmatch through powerful combinations of leadership, skilled Soldiers, and technology. While the development of advanced technologies is important, the integration of these technologies into Army units and training maximizes the potential of any technology. The Systems Engineering major will provide you the opportunity to strengthen your intellect and mental agility by learning how to analyze and design innovative solutions to complex issues that require system solutions.

**The Systems Engineering Program (A Sample SE 8TAP)**

Yearling Year		Cow Year		Firstie Year	
Fall	Spring	Fall	Spring	Fall	Spring
MA205 Calc. II	MA206 Prob and Stats	SE301 Introduction to Systems Engineering	SE302 Fundamentals of Systems Engineering	SE402 Capstone Design I	SE403 Capstone Design II
PH205 Physics I	PH206 Physics II	SE375 Engineering Stats	SE385 Decision Analysis	Simulation Elective (EM481/SE485/SM484)	EM411 Project Management
	SE370 Computer Aided Systems Engineering	SE387 Deterministic Models	SE388 Stochastic Models	Track Elective 3	SE400 Professional Eng. Seminar (1 cr)
		Track Elective 1	Track Elective 2	Track Elective 4	Track Elective 5

Complex systems require the integration of hardware, software, human, and organizational components while accounting for several types of Environmental considerations. **We offer several 5 course elective tracks** that align with one or more of these component types and considerations.

"Generally, the program taught me how to think critically and how to logically solve problems. It proved to be a big help when I went to get my MBA."

**Systems Engineering Elective Tracks**

Cyber Security Systems	Aeronautical Systems
Digital Communication Systems	General Engineering
Electrical Robotic Systems	Geographic Information
Electrical System	Web Application System
Environmental Systems	Artificial Intelligence
Infrastructure Systems	Human Factor Systems
Mechanical Robotic Systems	Software Systems
Nuclear Systems	*Student Designed Track
Power Energy Systems	