



INTEGRATED SYSTEMS DESIGN AND DYNAMICS

2023-24 STUDY GUIDE

About this degree option

The Integrated Systems Design and Dynamics graduate degree provides students with a senior level systems-based STEM education. The graduate degree is focused on the planning, architecture, design, and development of highly integrated systems. Students will learn how to design and develop technological complex systems using various modeling and simulation techniques. Students will be immersed in the fundamental theories of systems science and the application of those theories leading to the operationalization of complex systems across multiple domains.

Why this degree options?

K-State Salina offers a variety of advantages, including:

- Gain skills needed to think and work systematically when approaching industry problems.
- Understand complex technological systems.
- Focus on planning, designing and developing integrated machine learning systems, autonomous systems, aerospace systems and cyber systems.

Careers

Career options for Master of Science in Integrated Systems Design and Dynamics graduates include, but are not limited to:

- Senior Systems Engineer
- Manager of Information Technology
- Senior Machine Learning Engineer
- Systems Manager
- Director of Engineering
- Smart Materials and Manufacturing Engineer

Accreditation

We take our reputation seriously. Accreditation validates the quality of an institution as a whole, offering evaluated measurements of everything from academic offerings, governance, administration, mission, finances and resources. Kansas State University has been continuously accredited by the Higher Learning Commission (HLC) since 1916.

k-state.edu/assessment/accreditation

Master of Science

32 credit hours required

Degree Requirements:

COT 839	Integrated System Thesis**	6
CYBR 601	Introduction to Cybernetic Modeling & Simulation	3
CYBR 603	Integrated Systems Architecture	3
CYBR 707	Methods, Design & Analysis	5
CYBR 708	Cybernetic Systems Design & Dynamics	3
	Focus Area Elective	12
	Total	32

**Once started, thesis courses must be taken in a connected sequence until completion.

Thesis must be broken up into one of two options:

- 2x3 - 2 courses, 3 credit hours each course
- 3x2 - 3 courses, 2 credit hours each course

Electives (Choose a Focus Area):

Aerospace Systems:

AVT 790	Aerospace Topics	3
COT 734	Aircraft Production Certification	3
COT 741	Aerospace Manufacturing and Materials	3
COT 744	Aviation Human Factors Analysis and Design	3
	Total	12

Machine Learning & Autonomous Systems:

MLAS 650	Autonomous Systems Studio	3
MLAS 700	Advanced Cybernetic Systems	3
MLAS 750	Autonomous Networking within Cyber-Physical Systems	3
MLAS 800	Integrated Machine Learning & Autonomous Systems	3
	Total	12

Aerospace Materials:

COT 741	Aerospace Manufacturing & Materials	3
SSO 735	Electron Microscopy of Aerospace Materials	3
SSO 736	Aerospace Metallurgy and Ceramics	3
SSO 738	Advanced Composite Materials	3
	Total	12

Systems Management:

COT 706	Informatics & Technology Management	3
COT 715	Systems Project Management	3
COT 720	Application of Lean Six Sigma	3
CYBR 710	Advanced Data Analytics for Cybernetic Systems	3
	Total	12

Aerospace Cyber Defense:

COT 682	Open Source Cyber Surveillance	3
COT 684	Adv Topics in Cyber Data Fusion	3
COT 760	Aerospace Cybersecurity Studio	3
COT 751	Cyber Defense Methods	3
	Total	12