

**EXPECTED COURSE OFFERINGS
INFORMATION SYSTEMS ENGINEERING PROGRAM**

The schedule below is based on historical patterns and expected scheduling. The semester and location in which a course may be offered *is subject to change* due to instructor availability, student demand, and the need to provide an appropriate balance of subjects and course levels in all semesters. Courses may be offered at the Applied Physics Laboratory (A), Online (O), Virtual Live (VL), or as an Independent Study (IS), as indicated.

Course Number	Course Name	Summer	Fall	Spring
Prerequisites				
605.201	Introduction to Programming Using Java	O	O/VL	O/VL
605.202	Data Structures	O/VL	O/VL	O/VL
605.203	Discrete Mathematics		A/O/VL	O
605.206	Introduction to Programming Using Python	O	O	O
Foundation Courses				
605.601	Foundations of Software Engineering	O/VL	O/VL	O/VL
635.601	Foundations of Information Systems Engineering		O	O
695.601	Foundations of Information Assurance	O	O/VL	O/VL
Focus Areas				
Select one of the following Focus Areas:				
Cybersecurity Data Engineering Enterprise Engineering Human-Computer Engineering Intelligent Systems Engineering Internet of Things Project Management Software Engineering Independent Study and Special Topics				

Courses by Focus Area				
	CYBERSECURITY - This focus area requires Data Structures			
635.673	Protecting Critical Infrastructure Against Cyber Attacks			O
635.676	Cybersecurity in Information Systems		O/VL	O
635.775	Cyber Operations, Risk, and Compliance	O	O	O
605.602	Software Analysis and Design			
605.731	Survey of Cloud Computing Security	O		
695.611	Embedded Computer Systems-Vulnerabilities, Intrusions, and Protection Mechanisms		O	O
695.612	Operating Systems Security		VL	VL
695.614	Security Engineering			VL
695.615	Cyber Physical Systems Security		O	
695.621	Public Key Infrastructure and Managing E-Security	VL	O	
695.622	Web Security	O	O	O
695.642	Intrusion Detection	O	O	O
695.712	Authentication Technologies		VL	
695.721	Network Security		O	VL
	DATA ENGINEERING- This focus area requires Data Structures			
635.631	Foundations of Data Analytics			
605.641	Principles of Database Systems	O	O	O
605.643	Linked Data and the Semantic Web	O		
605.644	XML Design Paradigms	O	O	
605.741	Large-Scale Database Systems	O	O	O
605.744	Information Retrieval		O	
605.788	Big Data Processing Using Hadoop		O	O
685.652	Data Engineering Principles and Practice	VL	VL	VL
	ENTERPRISE ENGINEERING - This focus area requires Data Structures			
635.603	AI/ML Ops		VL	

635.632	Engineering Data Intensive Systems		VL	
635.672	Privacy Engineering		O	VL
635.782	Ethics in Intelligent Systems	VL	VL	VL
595.758	Data Science for the Technical Leader	O	O	O
605.609	DevOps and Secure Software Development	O	O	O
605.611	Foundations of Computer Architecture	O	O/VL	O/VL
605.702	Service-Oriented Architecture			
605.705	Software Safety		O	O
605.716	Modeling and Simulation of Complex Systems			VL
605.729	Formal Methods			VL
605.786	Enterprise System Design and Implementation			
605.789	Service API Design and Development	O	O	
645.753	Enterprise Systems Engineering	O	O	O
645.757	Foundations of Modeling and Simulation in Systems Engineering			O
645.761	Systems Architecting		O	O
645.764	Software Systems Engineering	O	O/VL	O/VL
645.767	System Conceptual Design	O/VL	O/VL	O/VL
645.768	System Design & Integration	O	O/VL	O/VL
645.769	System Test & Evaluation	O	O/VL	O/VL
695.741	Information Assurance Analysis	O	O	O
695.791	Information Assurance Architectures and Technologies			O
	HUMAN-COMPUTER ENGINEERING			
635.661	Principles of Human Computer Interaction		O	
525.747	Speech Processing			VL
525.786	Human Robotics Interaction			A
535.691	Haptic Interface Design		VL	
535.782	Haptic Applications	O		
605.646	Natural Language Processing		O	
605.662	Data Visualization	O	O	O

645.650	Foundations of Human Systems Engineering		O	O
645.651	Integrating Humans and Technology		O	O
645.755	Methods in Human-System Performance Measurement and Analysis		O	O
	INTELLIGENT SYSTEMS ENGINEERING- This focus area requires Data Structures			
635.603	AI/ML Ops		VL	
635.627	Intelligent Decision Support Systems			VL
635.631	Foundations of Data Analytics			
605.645	Artificial Intelligence	O	O	O
605.742	Deep Neural Networks	O	O	O
695.637	Introduction to Assured AI and Autonomy		O	
695.715	Assured Autonomy		VL	
695.737	AI for Assured Autonomy			O
	INTERNET OF THINGS			
635.611	Principles of Network Engineering			O
635.711	Advanced Topics in Network Engineering			
635.775	Cyber Operations, Risk, and Compliance	O	O	O
635.776	Building Information Governance			
525.678	Next Generation Mobile Networks and Security with 5G		VL	VL
525.768	Wireless Networks			
605.671	Principles of Data Communications Networks	O	O	A
605.674	Network Programming		O	
605.677	Internetworking with TCP/IP I	O	O	O
605.771	Wired and Wireless Local and Metropolitan Area Networks		O	
605.772	Network Security Management			
605.776	Fourth Generation Wireless Communications: WiMAX and LTE			
605.777	Internetworking with TCP/IP II			O
605.779	Network Design and Performance Analysis		O	

695.601	Foundations of Information Assurance	O	O/VL	O/VL
695.611	Embedded Computer Systems-Vulnerabilities, Intrusions, and Protection Mechanisms		O	O
695.614	Security Engineering			VL
695.634	Intelligent Vehicles: Cybersecurity for Connected and Autonomous Vehicles		VL	
	PROJECT MANAGEMENT			
635.671	Data Recovery & Continuing Operations		O	
635.775	Cyber Operations, Risk, and Compliance	O	O	O
635.776	Building Information Governance			
635.792	Entrepreneurship, Innovation, and Corporate Success		VL	
595.660	Planning and Managing Projects	O/VL	O/VL	O/VL
605.608	Software Project Management	O	O	O
605.708	Tools and Techniques of Software Project Management			VL
645.667	Management of Systems Projects	O/VL	O/VL	O/VL
645.742	Management of Complex Systems	O	O	O
	SOFTWARE ENGINEERING			
635.682	Website Development			O
635.683	E-Business: Models, Architecture, Technologies, and Infrastructure		O	VL
605.604	Object-Oriented Programming with C++	VL	O	O/VL
605.607	Agile Software Development Methods		O	O
605.621	Foundations of Algorithms	O	O	O
605.629	Programming Languages	O	O	O
605.635	Cloud Computing		O	O
605.649	Introduction to Machine Learning	O	O/VL	O/VL
605.681	Principles of Enterprise Web Development	O	O	O/VL
605.682	Web Application Development with Java	O	O	O
605.683	Java Enterprise Development: Processes, Tools and Infrastructure			

605.701	Software Systems Engineering			
605.704	Object-Oriented Analysis and Design	O	O	O
605.784	Enterprise Computing with Java	O	O/VL	O
605.787	Front End Web App Development		O	O
	INDEPENDENT STUDY AND SPECIAL TOPICS			
635.795	Information Systems Engineering Capstone Project			O/VL
635.801	Independent Study in Information Systems Engineering I	IS	IS	IS
635.802	Independent Study in Information Systems and Technology II	IS	IS	IS
<i>605.xxx see the Computer Science Program; 645.xxx see the Systems Engineering Program;</i>				
<i>695.xxx see the Cybersecurity Program; 595.xxx see the Engineering Mgmt. Program</i>				