CYBER SECURITY (CYBR)

CYBR 500 Introduction to Information Security Credits: 3
Overview of principles and approaches to information security. Topics include software vulnerabilities, secure software design principles, trusted computing base, authentication and access control, malware, network threats and defenses, and cryptography applications. Prerequisites: B.S. in Computer Science OR BS in a closely related field and the ability to program in a high-level programming language OR CYBR 505.
Pre-Requisite : CYBR 505
Fall: Department Discretion **Spring:** Department Discretion
Course Outline (https://eservices.minnstate.edu/registration/rest/rcId/0075/curricId/00204620/)

CYBR 505 Computer Science Foundations for Cybersecurity Credits: 3
This course will provide students with the fundamental knowledge of computer science that forms the technical foundation of the cybersecurity field with an essential focus on software development. The course will further develop coding and problem-solving skills and review critical concepts in algorithm development and computer architecture that are important in creating secure software and systems.
Fall: All Years
Course Outline (https://eservices.minnstate.edu/registration/rest/rcId/0075/curricId/00211148/)

CYBR 510 Cybersecurity Law and Policies Credits: 3
Information security vulnerabilities and risks; legal, cost, privacy, and technology constraints; derivation of strategies; technical and procedural means of achieving desired ends. Prerequisite: B.S. in Computer Science (or closely related field), or its equivalent.
Fall: All Years
Course Outline (https://eservices.minnstate.edu/registration/rest/rcId/0075/curricId/00204621/)

CYBR 520 Computer System Security Credits: 3
Design principles of secure systems, authentication, access control and authorization, discretionary and mandatory security policies, secure kernel design, and secure databases.
Pre-Requisite : CYBR 500
Fall: All Years
Course Outline (https://eservices.minnstate.edu/registration/rest/rcId/0075/curricId/00204622/)

CYBR 530 Internet Security Credits: 3
Study of fundamental principles of Internet security, approaches and techniques used in network attacks and defending mechanisms. Topics include threats and vulnerabilities of TCP/IP, DNS, and BGP protocols, denial of service (DOS) attacks, firewalls, IPsec, TLS, and web security.
Pre-Requisite : CYBR 520
Fall: Department Discretion **Spring:** Department Discretion
Course Outline (https://eservices.minnstate.edu/registration/rest/rcId/0075/curricId/00204623/)

CYBR 600 Risk Management Credits: 3
This course provides a comprehensive overview of risk management and its implications on IT infrastructures and compliance. It covers methodologies for risk assessment, security planning, mechanisms for protection against risks, responses to security incidents and maintaining acceptable risks and compliance requirements.
Pre-Requisite : CYBR 500
Summer Department Discretion
Course Outline (https://eservices.minnstate.edu/registration/rest/rcId/0075/curricId/00211149/)

CYBR 610 Penetration Testing Credits: 3
This course provides the student with network and system penetration testing methodologies to prepare businesses and developers to discover and mitigate security weaknesses. It covers the basic strategies and tools that prepare students to engage in proactive and aggressive cyber security activities, with a focus on penetration testing and ethical hacking.
Pre-Requisite : CYBR 505 AND CYBR 530
Fall: All Years
Course Outline (https://eservices.minnstate.edu/registration/rest/rcId/0075/curricId/00211150/)

CYBR 620 System Forensics and Incident Response Credits: 3
This course provides students with the background and skills to manage information security incidents to minimize impact on systems and software. Topics include understanding cyber threats, incident handling steps and response to different types of security incidents. Students explore these topics by utilizing industry-standard processes and forensics tools for investigating information security incidents.
Pre-Requisite : CYBR 505 AND CYBR 530
Spring: All Years
Course Outline (https://eservices.minnstate.edu/registration/rest/rcId/0075/curricId/00211151/)

CYBR 630 Secure Software Development Credits: 3
This course covers the design and implementation of secure software. Some of the topics covered are the characteristics of secure software, the role of security in the development lifecycle, designing secure software, and best security programming practices. Software security for web and mobile applications will be covered.
Pre-Requisite : CYBR 505 AND CYBR 530
Fall: All Years
Course Outline (https://eservices.minnstate.edu/registration/rest/rcId/0075/curricId/00211152/)

CYBR 650 Cybersecurity Capstone Credits: 3
This course involves the planning, approval, implementation and completion of a capstone project. The capstone provides culmination of the cybersecurity program in a self-directed research or practical project that showcases students mastery of cybersecurity topics.
Pre-Requisite : CYBR 630
Spring: All Years
Course Outline (https://eservices.minnstate.edu/registration/rest/rcId/0075/curricId/00211153/)