CYBERSECURITY (CYBR)

CYBR 101 - Cybersecurity in the Era of Evolving Technology
This course covers the fundamental concepts and design principles behind cybersecurity. This course will provide the students with the awareness, knowledge, opportunity and resources to develop the cybersecurity skills required for full participation as informed, responsible, ethical and productive citizens. Through research-oriented discussions and projects, the course will focus on security design, principles, ethics and models that all students should know and be able to apply independently when using technology, computing systems, digital media and information technology, including the internet.

Credits: 3
Term(s) Typically Offered: Offered Fall Terms
Thematic Thread(s): Citizenship & Social Problems, Conservation, Technology & Imagination, Transfer Thread Completion Course, United Stated in Global Context

CYBR 139 - Foundations of Academic Discovery
Foundations of Academic Discovery serves as the entry point to the Rock Integrated Studies Program. With its strong faculty-student interaction, the course promotes intellectual inquiry, critical and creative thinking, and computer skills needed for academic success. Through varied content, the course introduces students to academic discourse and information literacy while exploring topics such as diversity and inclusion and global awareness. This course will set students along the path to becoming engaged with issues and scholarship important to a 21st century education while they learn about themselves and their place in the world.

Credits: 3
Term(s) Typically Offered: Offered as Needed
Enrollment limited to students with a semester level of Freshman 1 or Freshman 2.
Enrollment limited to students with the ROCK STUDIES 2 STUDENT or ROCK STUDIES STUDENT attributes.

CYBR 190 - Experimental
A unique and specifically focused course within the general purview of a department which intends to offer it on a "one time only" basis and not as a permanent part of the department's curriculum.

Credits: 1-3
Term(s) Typically Offered: Offered as Needed

CYBR 195 - Workshop
A workshop is a program which is usually of short duration, narrow in scope, often non-traditional in content and format, and on a timely topic.

Credits: 1-6
Term(s) Typically Offered: Offered as Needed

CYBR 198 - Selected Topics
A Selected Topics course is a normal, departmental offering which is directly related to the discipline, but because of its specialized nature, may not be able to be offered on a yearly basis by the department.

Credits: 1-3
Term(s) Typically Offered: Offered as Needed

CYBR 290 - Experimental
A unique and specifically focused course within the general purview of a department which intends to offer it on a "one time only" basis and not as a permanent part of the department's curriculum.

Credits: 1-3
Term(s) Typically Offered: Offered as Needed

CYBR 295 - Workshop
A workshop is a program which is usually of short duration, narrow in scope, often non-traditional in content and format, and on a timely topic.

Credits: 1-6
Term(s) Typically Offered: Offered as Needed

CYBR 298 - Selected Topics
A Selected Topics course is a normal, departmental offering which is directly related to the discipline, but because of its specialized nature, may not be able to be offered on a yearly basis by the department.

Credits: 1-3
Term(s) Typically Offered: Offered as Needed

CYBR 301 - Secure Programming
This class will present the basic topics in computer security and their relationship to secure programming. A broad array of topics in secure software development will be covered such as the following: Security models, threats, design principles and secure coding practices. The course will cover programming language features and semantics to evaluate and to facilitate implementation of programs that are free from vulnerabilities. Additionally, different types of systems including web-based systems and some internals of OS kernel software testing and exploitation will be explored. Moreover, the software design patterns to built-in security during the architectural phase of the lifecycle will also be covered in detail.

Prerequisite: CPSC 246[C]
[C] Requires minimum grade of C.
Credits: 3
Term(s) Typically Offered: Offered Spring Terms
Enrollment limited to students with a semester level of Junior 1, Junior 2, Post Baccalaureate, Senior 1 or Senior 2.
Enrollment limited to students in a Bachelor of Science degree.

CYBR 353 - Software Assurance
This class will present a detailed description of software assurance practices, methods, and tools required throughout the software development life-cycle. The students will apply the development life-cycle processes and methodologies to explore common programming errors and to evaluate the common software testing tools.

Prerequisite: CYBR 301[C]
[C] Requires minimum grade of C.
Credits: 3
Term(s) Typically Offered: Offered Fall Terms
Enrollment limited to students with a semester level of Junior 1, Junior 2, Post Baccalaureate, Senior 1 or Senior 2.
Enrollment limited to students in a Bachelor of Science degree.

CYBR 390 - Experimental
A unique and specifically focused course within the general purview of a department which intends to offer it on a "one time only" basis and not as a permanent part of the department's curriculum.

Credits: 1-3
Term(s) Typically Offered: Offered as Needed
Enrollment limited to students with a semester level of Freshman 1, Freshman 2 or Sophomore 1.

CYBR 395 - Workshop
A workshop is a program which is usually of short duration, narrow in scope, often non-traditional in content and format, and on a timely topic.

Credits: 1-6
Term(s) Typically Offered: Offered as Needed
Students with a semester level of Freshman 1, Freshman 2 or Sophomore 1 may **not** enroll.

CYBR 398 - Selected Topics
A Selected Topics course is a normal, departmental offering which is directly related to the discipline, but because of its specialized nature, may not be able to be offered on a yearly basis by the department.

Credits: 1-3
Term(s) Typically Offered: Offered as Needed
Students with a semester level of Freshman 1, Freshman 2 or Sophomore 1 may **not** enroll.

CYBR 401 - Software Security Analysis
This course presents the tools and methods for analyzing software security. This course will focus on software penetration testing and will stress the critical aspects of software security testing in all phases of the software development life cycle with special emphasis on applications that are about to be deployed. An in-depth discussion on various security testing methods and tool vulnerabilities will be taught with hands-on demo of concepts during the class. Students will learn how to perform penetration testing in a practical way using well-established tools. The course will cover a wide range of topics such as web architecture, application infrastructure, reconnaissance, discovery, mapping, and exploitation.

Prerequisite: CYBR 353[C]
[C] Requires minimum grade of C.
Credits: 3
Term(s) Typically Offered: Offered Spring Terms
Enrollment limited to students with a semester level of Junior 1, Junior 2, Post Baccalaureate, Senior 1 or Senior 2.
Enrollment limited to students in a Bachelor of Science degree.

CYBR 471 - Malware Analysis
This course covers foundational knowledge of discovering software vulnerabilities. The topics of reverse engineering and malware investigation will be presented in detail through the study of various cases and hand-on analysis of malware samples. It covers fundamental techniques that are used to analyze both source and binary code to equip the students with enough background knowledge for examining current threats and discussing the actions needed to prevent attackers from taking advantage of both known and unknown vulnerabilities.

Prerequisite: CYBR 353[C]
[C] Requires minimum grade of C.
Credits: 3
Term(s) Typically Offered: Offered Spring Terms
Enrollment limited to students with a semester level of Junior 1, Junior 2, Post Baccalaureate, Senior 1 or Senior 2.
Enrollment limited to students in a Bachelor of Science degree.

CYBR 490 - Independent Study
Independent Study courses give students the opportunity to pursue research and/or studies that are not part of the university's traditional course offerings. Students work one on one or in small groups with faculty guidance and are typically required to submit a final paper or project as determined by the supervising professor.

Credits: 1-3
Term(s) Typically Offered: Offered as Needed
Students with a semester level of Freshman 1, Freshman 2 or Sophomore 1 may **not** enroll.

CYBR 495 - Workshop
A workshop is a program which is usually of short duration, narrow in scope, often non-traditional in content and format, and on a timely topic.

Credits: 1-6
Term(s) Typically Offered: Offered as Needed
Students with a semester level of Freshman 1, Freshman 2 or Sophomore 1 may **not** enroll.

CYBR 498 - Selected Topics
A Selected Topics course is a normal, departmental offering which is directly related to the discipline, but because of its specialized nature, may not be able to be offered on a yearly basis by the department.

Credits: 1-3
Term(s) Typically Offered: Offered as Needed
Students with a semester level of Freshman 1, Freshman 2 or Sophomore 1 may **not** enroll.