COLLEGE OF ENGINEERING

CYBERSECURITY B.S.C.Y.S.

TOTAL DEGREE HOURS: 120

The Cybersecurity major focuses on technology, people, information, and processes to enable assured cyber operations in the context of adversaries. The program is built on a technical foundation of computing and information technology. Students in this program acquire a background in cybersecurity related to information, software, systems, users, and organizations including aspects of policy, human factors, risk management, ethics, and impact on society.

MISSION STATEMENT

In keeping with the mission of the College of Engineering, the Department of Computer Science and Engineering strives for excellence in teaching, research, and public service. Specifically, the Department aspires to:

Lead the advancement of computer science, computer engineering, information technology, and cybersecurity through internationally recognized research and education, as well as technology transfer.
Prepare students for full and ethical participation in a diverse society and encourage lifelong learning.
Educate students in the best practices of the field as well as integrate the latest research into the curriculum.
Foster the development of problem solving and communication skills as an integral component of the profession.
Provide quality learning experiences through effective classroom practices, active learning styles of teaching, and opportunities for meaningful interactions between students and faculty.

PROGRAM EDUCATIONAL OBJECTIVES AND STUDENT OUTCOMES

The Department has established the following program educational objectives for the Cybersecurity graduates.

Objective 1: Our graduates will apply their knowledge and skills to succeed in their careers and/ or obtain an advanced degree.

Objective 2: Our graduates will function ethically and responsibly, and will remain informed and involved as full participants in our profession and society.

Objective 3: Our graduates will creatively solve problems, communicate effectively, and successfully function in multi-disciplinary teams.

Objective 4: Our graduates will develop and apply principles and practices of cybersecurity to protect computing equipment, data, process, and people from adversaries and exposure.

The following are the Student Outcomes. Graduates of the program will have an ability to:

Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.

Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.

Communicate effectively in a variety of professional contexts.

Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.

Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.

Apply security principles and practices to maintain operations in the presence of risks and threats.

STUDENT ENROLLMENT DATA

Student enrollment data is posted on the Department website.

COLLEGE OF ENGINEERING

UNIVERSITY ADMISSIONS - COLLEGE OF ENGINEERING

Admission to the University is based on the University's Undergraduate Admission Requirements that may be found by clicking on the following urls:

Freshman: https://www.usf.edu/admissions/freshmen/admission-information/requirements-deadlines.aspx
Transfer: https://www.usf.edu/admissions/transfer/admission-information/index.aspx
International: https://www.usf.edu/admissions/international/admission-information/index.aspx
For Admission information specific to the College of Engineering, see the information at College of Engineering.

PROGRESSION REQUIREMENTS IN THE UPPER DIVISION - CYBERSECURITY B.S.C.Y.S.

Cybersecurity students who have fully met the below requirements and are in good standing may progress into the upper division for the major. Prior to progression into the upper division, a student may be permitted to take no more than two Departmental courses. The department may have continuation requirements, which specify minimum performance standards in core major courses which must be met before further registration in the department is granted.

Completion of with a minimum acceptable grade for each of the courses is C (grades of C- are insufficient).
MAD 2104 - Discrete Mathematics Credit(s): 3
STA 2023 - Introductory Statistics I Credit(s): 3
PHY 2020 - Conceptual Physics Credit(s): 3
MAC 1147 - Precalculus Algebra and Trigonometry Credit(s): 4
All students must complete the equivalent of USF Discrete Mathematics (MAD 2104), Introductory Statistics (STA 2023), Conceptual Physics (PHY 2020), and Pre-calculus with Algebra and Trigonometry (MAC 1147) with minimum grades of C in each course (grades of C- are insufficient). The minimum overall grade average in these four courses required for progression to the upper level is between 2.0 and 3.5 for any given year. The minimum acceptable grade average will be posted on the department's website one year prior to the fall semester that the revised grade average is applicable. The computed grade average is based on the best attempts in these courses. These requirements must be met with a maximum of two attempts allowed for each course.
2. A minimum overall GPA of 2.0.

3. A minimum USF GPA of 2.0.

4. Completion of **CGS 1540 - Introduction to Databases for Information Technology Credit(s): 3** with a minimum grade of B (grade of B- is insufficient) or another introductory database course with a minimum grade of B (grade of B- is insufficient).

DEPARTMENTAL POLICIES

In addition to the College's graduation requirements, the Department has the following policies:

Mandatory academic advising and/or mentoring of students.
Exit interview and/or survey as a graduation requirement.

STATE MANDATED COMMON COURSE PREREQUISITES - CYBERSECURITY B.S.C.Y.S.

Following Florida BOG Regulation 8.010, state mandated common course prerequisites are lower-division courses that are required for progression into the upper division of a particular baccalaureate degree program.

Transfer students should complete the State Mandated Common Course Prerequisites at the lower level prior to entering the university. If these courses are not taken at a Florida College System institution, they must be completed before the degree is granted. Successful completion of the common prerequisites alone does not guarantee a student admission into the degree program.

Unless stated otherwise, a grade of C- is the minimum acceptable grade in prerequisite courses.

COLLEGE OF ENGINEERING

Students should complete the following prerequisite courses at the lower level prior to entering the university. If these courses are not taken at a Florida College System institution, they must be completed before the degree is granted.

PSY X012 Intro to Psychology - 3 credit hours
ECO X013 Macroeconomics - 3 credit hours
STA X023 Introductory Statistics I **OR** STA X122 - 3 credit hours
MAC X147 **OR** (MAC X140 and MAC X114) - 3 credit hours
PHY 1000 - PHY 2999 Any Physics course - 3 credit hours
MAD X104 Discrete Math - 3 credit hours
CGS X540 **OR** CGS X540C **OR** CGS X545 **OR** COP X710 Intro to Databases for Information Technology - 3-4 credit hours
COP X512 **OR** COP X210 **OR** COP X270 **OR** COP X006 **OR** COP X272C **OR** COP X500 **OR** COP X220 **OR** COP X360 **OR** COP X800 Programming Fundamentals for Information Technology - 3-4 credit hours
COP X513 **OR** COP X551C **OR** COP X000 **OR** COP X224 **OR** COP X250 Object-Oriented Programming for Information Technology - 3 credit hours

REQUIRED COURSES: (102 CREDIT HOURS)

MAJOR CORE COURSES: 32 COURSES; 93 CREDIT HOURS

MATH AND SCIENCE COURSES: 5 COURSES; 16 CREDIT HOURS

STA 2023 - Introductory Statistics I **Credit(s): 3**
MAC 1147 - Precalculus Algebra and Trigonometry **Credit(s): 4**
PHY 2020 - Conceptual Physics **Credit(s): 3**
MAD 2104 - Discrete Mathematics **Credit(s): 3**
General Education Natural Science Elective

BREADTH COURSES: 2 COURSES; 6 CREDIT HOURS

PSY 2012 - Introduction to Psychological Science **Credit(s): 3**
ECO 2013 - Economic Principles (Macroeconomics) **Credit(s): 3**

BASIC ENGINEERING: 2 COURSES; 3 CREDIT HOURS

EGN 3000 - Foundations of Engineering **Credit(s): 0-3**
EGN 3000L - Foundations of Engineering Lab **Credit(s): 3**

SPECIALIZATION COURSES: 20 COURSES; 59 CREDIT HOURS

CGS 1540 - Introduction to Databases for Information Technology **Credit(s): 3**
CGS 3303 - IT Concepts **Credit(s): 3**
CIS 3213 - Foundations of Cybersecurity **Credit(s): 3**
CIS 4200 - Penetration Testing for IT **Credit(s): 3**
CIS 4219 - Human Aspects of Cybersecurity **Credit(s): 3**
CIS 4622 - Hands-on Cybersecurity **Credit(s): 3**
CEN 3722 - Human Computer Interfaces for Information Technology **Credit(s): 3**
COP 2512 - Programming Fundamentals for Information Technology **Credit(s): 3**
COP 2513 - Object Oriented Programming for Information Technology **Credit(s): 3**
COP 3515 - Advanced Program Design for Information Technology **Credit(s): 3**
CGS 3853 - Web Systems for IT **Credit(s): 3**
CNT 4104 - Computer Information Networks for Information Technology **Credit(s): 3**
CNT 4104L - Computer Information Networks Laboratory for Information Technology **Credit(s): 1**
CNT 4403 - Network Security and Firewalls **Credit(s): 3**
COP 4538 - Data Structures and Algorithms for Information Technology **Credit(s): 3**
COP 4703 - Advanced Database Systems for Information Technology **Credit(s): 3**
CIS 3363 - Information Technology Systems Security **Credit(s): 3**
LIS 4414 - Information Policy and Ethics **Credit(s): 3** (College of Arts & Sciences course)
CIS 4935 - Senior Project in Information Technology **Credit(s): 4**
ISM 4323 - Information Security and IT Risk Management **Credit(s): 3** (Muma College of Business course)

COLLEGE OF ENGINEERING

COMPOSITION AND TECHNICAL WRITING COURSES: 3 COURSES; 9 CREDIT HOURS

ENC 1101 - Composition I **Credit(s): 3**
ENC 1102 - Composition II **Credit(s): 3**
ENC 3246 - Communication for Engineers **Credit(s): 3**

MAJOR ELECTIVES: 3 COURSES; 9 CREDIT HOURS

The undergraduate section of the department website contains the most up-to-date list of approved cybersecurity electives. The posted list also describes the required pre-requisites for the electives. Additional electives may be available with a Special Topics course number (COP 4931). A maximum of nine (9) hours combined of COP 4900 Independent Study in IT and CIS 4947 Industry Internship for IT are allowed as cybersecurity electives, with no more than 3 hours in any one given company for CIS 4947 credit. Consult with the Department Undergraduate Advisor to learn more about available electives.

COLLEGE OF ENGINEERING – DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CAP 4136 - Malware Analysis and Reverse Engineering **Credit(s): 3**
CIS 4947 - Industry Internship for IT **Credit(s): 1-5**
CNT 4716C - Network Programming for IT **Credit(s): 3**
COP 4368 - Adv Object-Oriented Programming for IT **Credit(s): 3**
COP 4900 - Independent Study in Information Technology **Credit(s): 1-5**
COP 4931 - Special Topics for Information Technology **Credit(s): 3**
    Check department website for list of approved electives under COP 4931

COLLEGE OF ARTS AND SCIENCES – SCHOOL OF INFORMATION

CIS 3360 - Principles of Information Security **Credit(s): 3**
CIS 3362 - Cryptography and Information Security **Credit(s): 3**
CIS 4361 - Information Assurance and Security Management for IT **Credit(s): 3**
LIS 4779 - Health Information Security **Credit(s): 3**

MUMA COLLEGE OF BUSINESS – DEPARTMENT OF INFORMATION SYSTEMS DECISION SCIENCES

CIS 4203 - Cyber Forensics and Investigations **Credit(s): 3**
CIS 4368 - Database Security and Audits **Credit(s): 3**
ISM 4041 - Global Cyber Ethics **Credit(s): 3**

COLLEGE OF EDUCATION – DEPARTMENT OF TEACHING AND LEARNING

EDG 3801 - Cybersecurity and the Everyday Citizen **Credit(s): 3**

INDUSTRY INTERNSHIP

The Department of Computer Science and Engineering and the College of Engineering recommend that BSCYS students complete an industry internship. Students may earn up to nine credit hours, as elective, for CIS 4947 - Industry Internship for IT **Credit(s): 1-5** Industry Internship for IT, no more than three credit hours in any one given company. Internships for CIS 4947 must be in the area of Cybersecurity.

ADDITIONAL INFORMATION - CYBERSECURITY B.S.C.Y.S.

OTHER REQUIREMENTS

Currently, a student pursuing the Cybersecurity major may not pursue a second major while simultaneously enrolled in the Cybersecurity undergraduate major.

GPA REQUIREMENTS

COLLEGE OF ENGINEERING

Students must have and maintain a minimum 2.0 semester GPA, 2.0 Math and Science GPA, 2.0 Engineering GPA, 2.0 Specialization GPA, 2.0 USF GPA, and 2.0 overall GPA.

GRADING REQUIREMENTS

Unless otherwise stated, the minimum acceptable grade in all major required math, science, and engineering courses is a C or higher (C- in insufficient). The minimum acceptable grade in state mandated prerequisite courses is a C or higher (C- is insufficient). The minimum acceptable grade in specialization courses is a C-, expect as stated in the program progression and continuation requirements.

RESIDENCY REQUIREMENTS

Transfer students must complete a minimum number of approved major core courses in the major at USF. The minimum number of USF major core credit hours required is established by the respective academic department. In no case will this be less than 18 hours. Basic engineering courses are not considered specialization courses. The University residency requirement must also be met.

A concurrent degree (dual degree) student must meet the requirements of each major and have a minimum of 18 approved specialization hours taken in the degree granting department beyond those specialization hours required for the first degree.

RESEARCH OPPORTUNITIES - COLLEGE OF ENGINEERING

Undergraduate students in any degree program are able to participate in undergraduate research. Several options exist to show mentored undergraduate research activity on a student's official transcript. Those who wish to enroll in an undergraduate research course should consult with their academic advisor to understand how the credit will apply towards the degree requirements. If no credit is needed, students may be eligible to enroll in the 0-credit IDS 4914 - Advanced Undergraduate Research Experience course. This course will not impact degree credits or GPA but will show on an official transcript and document the experience. The Office of High Impact Practices and Undergraduate Research (HIPUR) is able to assist with further inquiries.

ADVISING INFORMATION - CYBERSECURITY B.S.C.Y.S.

Department Undergraduate Advisor: http://www.usf.edu/engineering/cse/undergraduate/contacts.aspx

Plans of Study - Cybersecurity B.S.C.Y.S.

NOTES:
>SCIV - Civics Literacy needs to be completed prior to graduation. For more information, see
>>https://www.usf.edu/undergrad/students/civics-literacy.aspx or talk with your academic advisor.
>Items that are critical are marked with a ✳ and are included in the plan for a student to stay on track.

Potential Entry Level Job Titles:
>Cybersecurity Specialist
>Information Technology Security Specialist
>Cybersecurity Consultant
>Information Security Analyst
>Penetration and Vulnerability Tester

Potential Entry Level Salary Range:
$45,000 - $75,000

Cybersecurity B.S.C.Y.S. - 2 Year Plan of Study

YEAR 1

SEMESTER 1 (FALL)

>CGS 3303 - IT Concepts **Credit(s): 3**
>CIS 3213 - Foundations of Cybersecurity **Credit(s): 3**
>CIS 4622 - Hands-on Cybersecurity **Credit(s): 3**
>COP 3515 - Advanced Program Design for Information Technology **Credit(s): 3**

COLLEGE OF ENGINEERING

EGN 3000 - Foundations of Engineering **Credit(s): 0-3**
ISM 4323 - Information Security and IT Risk Management **Credit(s): 3**
    NOTE: SCIV - Civics Literacy needs to be fulfilled prior to graduation. See advisor.
    Total Credit Hours: 15

SEMESTER 2 (SPRING)

CEN 3722 - Human Computer Interfaces for Information Technology **Credit(s): 3**
CIS 3363 - Information Technology Systems Security **Credit(s): 3**
CNT 4104 - Computer Information Networks for Information Technology **Credit(s): 3**
CNT 4104L - Computer Information Networks Laboratory for Information Technology **Credit(s): 1**
COP 4538 - Data Structures and Algorithms for Information Technology **Credit(s): 3**
ENC 3246 - Communication for Engineers **Credit(s): 3**
    Total Credit Hours: 16

SEMESTER 3 (SUMMER)

Internship/Co-op Participation (see advisor for credit options - CIS 4947 - Industry Internship for IT)
Total Credit Hours: 0

YEAR 2

SEMESTER 4 (FALL)

CGS 3853 - Web Systems for IT **Credit(s): 3**
CIS 4200 - Penetration Testing for IT **Credit(s): 3**
CNT 4403 - Network Security and Firewalls **Credit(s): 3**
COP 4703 - Advanced Database Systems for Information Technology **Credit(s): 3**
Approved Cybersecurity Elective **Credit(s): 3**
    Total Credit Hours: 15

SEMESTER 5 (SPRING)

CIS 4219 - Human Aspects of Cybersecurity **Credit(s): 3**
CIS 4935 - Senior Project in Information Technology **Credit(s): 4**
LIS 4414 - Information Policy and Ethics **Credit(s): 3**
Approved Cybersecurity Elective **Credit(s): 3**
Approved Cybersecurity Elective **Credit(s): 3**
    NOTE: TGEH - High Impact Practice requirement is met with CIS 4935
    NOTE: TGEE - Ethical Reasoning & Civic Engagement requirement is met with LIS 4414
    Total Credit Hours: 16

Cybersecurity B.S.C.Y.S. - 4 Year Plan of Study

YEAR 1

SEMESTER 1 (FALL)

✳ CGS 1540 - Introduction to Databases for Information Technology **Credit(s): 3**
EGN 3000 - Foundations of Engineering **Credit(s): 0-3**
EGN 3000L - Foundations of Engineering Lab **Credit(s): 3**
ENC 1101 - Composition I **Credit(s): 3**
MAC 1147 - Precalculus Algebra and Trigonometry **Credit(s): 4**
    NOTE: TGEC - Creative Thinking requirement is met with EGN 3000L
    NOTE: SCIV - Civics Literacy requirement needs to be fulfilled prior to graduation. See advisor.
    Total Credit Hours: 13

SEMESTER 2 (SPRING)

✳ COP 2512 - Programming Fundamentals for Information Technology **Credit(s): 3**

COLLEGE OF ENGINEERING

✳ MAD 2104 - Discrete Mathematics **Credit(s): 3**
ENC 1102 - Composition II **Credit(s): 3**
PHY 2020 - Conceptual Physics **Credit(s): 3**
SGEH - General Education Core Humanities **Credit(s): 3**
    Total Credit Hours: 15

SEMESTER 3 (SUMMER)

Please consider pursing High Impact Practice opportunities this semester such as Education Abroad, Internship Opportunities, Community Engagement, or Research Opportunities.

Questions about opportunities? Schedule an appointment with your academic advisor.

YEAR 2

SEMESTER 4 (FALL)

✳ COP 2513 - Object Oriented Programming for Information Technology **Credit(s): 3**
CGS 3303 - IT Concepts **Credit(s): 3**
ECO 2013 - Economic Principles (Macroeconomics) **Credit(s): 3**
STA 2023 - Introductory Statistics I **Credit(s): 3**
    NOTE: SGES - General Education Core Social Sciences requirement is met with ECO 2013
    Total Credit Hours: 12

SEMESTER 5 (SPRING)

CIS 3213 - Foundations of Cybersecurity **Credit(s): 3**
COP 3515 - Advanced Program Design for Information Technology **Credit(s): 3**
PSY 2012 - Introduction to Psychological Science **Credit(s): 3**
SGEN - General Education Core Natural Sciences **Credit(s): 3**
    NOTE: SGES - General Education Core Social Sciences requirement is met with PSY 2012
    Total Credit Hours: 12

SEMESTER 6 (SUMMER)

TGED - Human & Cultural Diversity **Credit(s): 3**
TGEI - Information and Data Literacy **Credit(s): 3**
General Elective **Credit(s): 3**
Total Credit Hours: 9

YEAR 3

SEMESTER 7 (FALL)

CEN 3722 - Human Computer Interfaces for Information Technology **Credit(s): 3**
CIS 3363 - Information Technology Systems Security **Credit(s): 3**
CIS 4622 - Hands-on Cybersecurity **Credit(s): 3**
COP 4538 - Data Structures and Algorithms for Information Technology **Credit(s): 3**
ISM 4323 - Information Security and IT Risk Management **Credit(s): 3**
    Total Credit Hours: 15

SEMESTER 8 (SPRING)

CGS 3853 - Web Systems for IT **Credit(s): 3**
CIS 4219 - Human Aspects of Cybersecurity **Credit(s): 3**
CNT 4104 - Computer Information Networks for Information Technology **Credit(s): 3**
CNT 4104L - Computer Information Networks Laboratory for Information Technology **Credit(s): 1**
ENC 3246 - Communication for Engineers **Credit(s): 3**
Approved Cybersecurity Elective **Credit(s): 3**
    Total Credit Hours: 16

COLLEGE OF ENGINEERING

SEMESTER 9 (SUMMER)

Internship/Co-op Participation (see advisor for credit options - CIS 4947 - Industry Internship for IT)
Total Credit Hours: 0

YEAR 4

SEMESTER 10 (FALL)

CIS 4200 - Penetration Testing for IT **Credit(s): 3**
CNT 4403 - Network Security and Firewalls **Credit(s): 3**
COP 4703 - Advanced Database Systems for Information Technology **Credit(s): 3**
Approved Cybersecurity Elective **Credit(s): 3**
General Elective **Credit(s): 3**
    Total Credit Hours: 15

SEMESTER 11 (SPRING)

CIS 4935 - Senior Project in Information Technology **Credit(s): 4**
LIS 4414 - Information Policy and Ethics **Credit(s): 3**
Approved Cybersecurity Elective **Credit(s): 3**
General Elective **Credit(s): 3**
    NOTE: TGEH - High Impact Practice requirement is met with CIS 4935
    Total Credit Hours: 13