Computer and Information Science, Bachelor of Science

Cyber and Information Security Technology major

Software Development major

Program Overview

The Bachelor of Science in Computer and Information Science (CIS) degree covers all aspects of the use of computers and information systems in today's organizations, including operating systems, software programs, networking, and security. There are two majors in the Bachelor of Science in Computer and Information Science degree: (1) Cyber and Information Security Technology and (2) Software Development. For the Cyber and Information Security Technology major, students can choose from the Cloud Computing track, the Cybersecurity track, Digital Forensics Technology track or 15 semester hours of electives. For the Software Development major, students can choose from the Web Design & Development rack, the Mobile Development track, Data Analytics track or 14 semester credit hours of Software Development electives. These employer-drive, hands-on interactive educational programs equip students with cyber, networking, and software development skills required for career-entry positions in a wide range of companies.

Program Outcomes

Students in the Bachelor of Science in Computer and Information Science program develop planning, design, implementation, and support skills in operating systems, networking, software programs, and security. Students develop additional focused skills based on which major the student pursues. Students also learn principles of excellent customer service in order to assist clients with technical issues.

Upon successful completion of the Bachelor of Science in Computer & Information Science, graduates are able to:

- Design, implement, and evaluate computer-based solutions that incorporate the appropriate computing requirements identified through the analysis of specific organizational or computing problems
- Function effectively on teams to establish goals, plan tasks, meet deadlines, manage risk, and produce deliverables
- Apply written, oral, and graphical communication in both technical and non-technical environments
- Evaluate and use appropriate technical literature
- Engage in continuous professional development through user groups, associations, conferences, readings, research, and other channels
- Develop and apply ethical and legal best practices in the maintenance and security of information and systems

For additional information about the program link to: http://www.ecpi.edu/technology/?intcmp=technology-btn. To see the Student Consumer Information link to: https://www.ecpi.edu/student-consumer-services which provides additional information on the future careers, success, cost, and financing for this program. For information on the University Completion and Graduation Rates, please see About ECPI University on the ECPI website.

CYBER AND INFORMATION SECURITY TECHNOLOGY MAJOR

Cyber and Information Security Technology Major Overview

With the growth of the internet, organizations are networking and securing their internal computer resources and connecting to external internet-based resources. The pervasiveness of the internet presents new opportunities through cloud computing, virtualization, storage, and software defined networks that present challenges in Cybersecurity to defend critical network infrastructure against cyber threats.

This employer-driven, hands-on, interactive educational program equips students with the networking and security skills required for career-entry positions in a wide range of organizations. Students are introduced to a variety of operating system environments, networking technologies, and associated security practices.

Cyber and Information Security Technology Major Outcomes

In addition to the Bachelor of Science in Computer and Information Science program outcomes, students in the Cyber and Information Security Technology Major learn about installing, securing, testing, and maintaining computer networks.

Upon successful completion of the Cyber and Information Security Technology Major, graduates are able to:

- Plan, design, configure and administer a network and security infrastructure
- Maintain, monitor, and troubleshoot a network and security infrastructure
- Assess and implement technical and non-technical security controls to protect an organization from threats and vulnerabilities

Students can choose from one of four options:

- Cloud Computing Track - 15 semester credit hours
- Cybersecurity Track - 15 semester credit hours
- Digital Forensics Technology Track - 15 semester credit hours
- Cyber and Information Security Technology Electives - 15 semester credit hours

SOFTWARE DEVELOPMENT MAJOR

Software Development Major Overview

Computer programs tell the computer what to do, which database information to identify and access, how to process it, and what equipment to use. Programs vary widely depending upon the type of information to be assessed or generated.

This employer-driven, hands-on interactive educational program equips students with the computer programming and information processing skills required for career-entry positions in a wide range of organizations. Students are introduced to a variety of operating system environments and programming languages.

Software Development Major Outcomes

In addition to the Bachelor of Science in Computer and Information Science program outcomes, students in the Software Development Major learn how to manage projects, create interesting web pages, design and write a variety of programs, use and maintain databases, and understand and utilize computer networks.

Upon completion of the Software Development Major, graduates are able to:

- Design and develop secure software solutions using object-oriented principles
- Develop integrated systems solutions using software, web, and mobile applications to access organizational databases
- Plan secure software solutions with customers

Students can choose from one of four options:

- Data Analytics Track - 14 semester credit hours
- Mobile Development Track - 14 semester credit hours
- Software Development Electives - 14 semester credit hours
- Web Design & Development Track - 14 semester credit hours

About Computer and Information Science

Graduates of a Computer and Information Science degree program have many career options. They often have career paths that eventually lead them into IT management positions, including software project management. They are able to design and implement computer software systems (including simulations, games, business applications, and other systems). They may develop test plans and then test software applications to ensure their correct implementation.

Graduates also may work as security analysts, network architects, or administrators who design, implement, and maintain computer networks, including wireless networks.

Certain positions may require background checks, drug screening, and/or security clearances, depending on the position and industry.

Some entry-level job titles for a Bachelor of Science in Computer and Information Science graduate include: Cybersecurity Operations and Maintenance Specialist, Digital Forensics Analyst, Network and Datacenter Administrator, Web Programmer, Virtual Server Administrator, Storage Technology Manager, Computer Programmer, Software Developer, Application Programmer, Mobile App Developer, Systems Analyst, Database Programmer, and Systems Administrator. CIS graduates are required in many industries, so employment could be expected in most any military or business setting.

Recommended Certifications

Certifications are not required for completion of this program; however, ECPI encourages student to obtain all appropriate certifications to increase potential job opportunities. ECPI provides students in this program with vouchers which allow the student to take certification exams at a greatly reduced cost. Available certifications for this program include Microsoft, Cisco, EC-council, and Oracle certifications, A+, Network+, Linux+, and Security+.

Cybersecurity Apprenticeship Option

- To be successful in the IT field today, the industry requires that graduates have a degree, certifications, and work experience. The Apprenticeship Option for the Cybersecurity Track in the BS in Computer and Information Science program is intended for students with limited or no in-field work experience. The Program Director determines whether a student's education is best served through the Apprenticeship Option. If that is determined to be the case, then the Apprenticeship Option is considered required for graduation from the Information and Cybersecurity Operations program. To be considered, students must have a GPA of 3.0 or higher and a 90% or higher attendance rate, and be a full-time student. Current students in the Associate or Bachelor in Computer and Information Science program are eligible to apply for the Apprenticeship Option. Students must apply before the end of their first semester.
- No additional credit is earned. Each apprenticeship in this option must be approved by the faculty course manager in advance of participation. Apprenticeships are pass/fail.
- Apprenticeships are work experiences that may include consultancy-type projects and/or applied research that solves problems.
- Apprenticeships are work experiences designed to apply the material learned in class. The Apprenticeship Option is open to domestic students only. Students must maintain full-time student status while participating in apprenticeship courses. If selected, students must remain an active student at ECPI University during the apprenticeship and will be assigned a mentor that they will work with throughout the apprenticeship. The program consists of up to six semesters of apprenticeship courses.
- Students enter the Apprenticeship Option on a probationary status and will be evaluated after the completion of 500 hours to determine if the apprentice will continue in the program. After the probationary period, students will be evaluated every 500 hours.

Program Outline

To receive the Bachelor of Science in Computer and Information Science, students must earn 120 semester credit hours. The program requires a minimum of 8 semesters, which is equivalent to 30 months or 120 weeks of instruction. The program requirements are as follows:

Program Requirements

Core Curriculum

28 semester credit hours

BUS121	Introduction to Business	3
CIS123	Introduction to Python Scripting	3
CIS126	Introduction to Programming	3
CIS142	Introduction to Cloud Solutions	3
CIS150	Introduction to Networking	3
CIS206	Linux Administration	3
CIS212	Principles of Cybersecurity	3
CIS223	Introduction to Databases	3
PMT472	Applied Project Management	3
PMT472L	Applied Project Management LAB	1

Arts and Sciences*

31 semester credit hours

CAP480	Arts and Sciences Capstone	3
COM115	Principles of Communication	3
ENG110	College Composition	3
ENG120	Advanced Composition	3
HUM205	Culture and Diversity: Exploring the Humanities	3
MTH131	College Algebra	3
MTH140	Statistics	3
PSY105	Introduction to Psychology	3
PSY220	Positive Psychology	3
	***ONE LECTURE COURSE AND CORRESPONDING LAB FROM THE FOLLOWING:	
PHY120	Physics	3
PHY120L	Physics LAB	1
	OR	
BIO122	Environmental Biology	3
BIO122L	Environmental Biology LAB	1

**For allowable substitutions of arts and sciences courses, see the Arts & Sciences Department page.*

Self-Integration

9 semester credit hours

CIS106	Introduction to Operating Systems	3
CIS108	Office Applications	2
COR191	Career Orientation	1
FOR110	Essentials for Success	3

CYBER AND INFORMATION SECURITY TECHNOLOGY MAJOR

Required Courses

37 semester credit hours

CIS101	Computer Configuration I	3
CIS202	Introduction to Routing and Switching	3
CIS202L	Introduction to Routing and Switching LAB	1
CIS204	Intermediate Routing and Switching	3
CIS207L	Network Routing and Switching Lab	1
CIS225	Network Protocols and Services	3
CIS245	Windows Client and Server	3
CIS245L	Windows Client and Server LAB	1
CIS251	Advanced Windows Server	3
CIS256	Windows Active Directory	3
CIS256L	Windows Active Directory LAB	1
CIS321	Network Scripting	3
CIS403	Ethical Hacking	3
CIS425	Advanced Defense and Countermeasures	3
	***ONE OF THESE TWO COURSES:	
CIS495	Cyber and Network Security Capstone	3
CIS490	Bachelor's Externship-CIS	3

Cloud Computing Track

15 semester credit hours

CIS242	AWS Academy Cloud Foundations	3
CIS253	Network Virtualization Fundamentals	3
CIS253L	Network Virtualization Fundamentals Lab	1
CIS305	Advanced Linux Administration	3
CIS305L	Advanced Linux Administration LAB	1
CIS335	AI/Machine Learning	3
CIS403L	Ethical Hacking Lab	1

Cybersecurity Track

15 semester credit hours

CIS230	Advanced Cybersecurity	3
CIS230L	Advanced Cybersecurity LAB	1
CIS305	Advanced Linux Administration	3
CIS335	AI/Machine Learning	3
CIS403L	Ethical Hacking Lab	1
CIS411	Ethical Hacking II	3
CIS425L	Advanced Defense and Countermeasures LAB	1

Apprenticeship Option

0 semester credit hours

APP491	Cybersecurity Apprenticeship I	0
APP492	Cybersecurity Apprenticeship II	0
APP493	Cybersecurity Apprenticeship III	0
APP494	Cybersecurity Apprenticeship IV	0
APP495	Cybersecurity Apprenticeship V	0
APP496	Cybersecurity Apprenticeship VI	0

Digital Forensics Technology Track

15 semester credit hours

CJ106	Criminal Law	3
CJ125	Criminal Procedure	3
CJ200	Investigations	3
CJ310	Digital Forensic Analysis	3
CJ315	Mobile Device Forensics	3

Elective Courses

15 semester credit hours

CIS123L	Introduction to Python Scripting Lab	1
CIS230	Advanced Cybersecurity	3
CIS230L	Advanced Cybersecurity LAB	1
CIS253	Network Virtualization Fundamentals	3
CIS253L	Network Virtualization Fundamentals Lab	1
CIS282	Web Interface Design	3
CIS305	Advanced Linux Administration	3
CIS305L	Advanced Linux Administration LAB	1
CIS425	Advanced Defense and Countermeasures	3
CIS425L	Advanced Defense and Countermeasures LAB	1
CIS490	Bachelor's Externship-CIS	3
CIS491	Externship-CIS Sr. I-a	1
CIS492	Externship-CIS Sr. I-b	1
CIS493	Externship-CIS Sr. I-c	1
CIS494	Externship-CIS Sr. II	2
CIS496	CIS Externship Project	1
EET282	Wireless Security	3

SOFTWARE DEVELOPMENT MAJOR

Required Courses

38 semester credit hours

CIS121	Logic and Design	3
CIS126L	Introduction to Programming LAB	1
CIS213	Javascript	3
CIS224	Server-Side Scripting with PHP	3
CIS226	Introduction to Object Oriented Programming	3
CIS250	Structured Query Language	3
CIS282	Web Interface Design	3
CIS332	Mobile App Development I	3
CIS420	Systems Analysis and Design	3
	***ONE OF THESE TWO COURSES:	
CIS214	Object-Oriented Programming Using C#	3
CIS218	Object-Oriented Programming Using JAVA	3
	***ONE OF THESE TWO COURSES:	
CIS317	Advanced Object-Oriented Programming Using C#	3
CIS319	Advanced Object-Oriented Programming Using Java	3
	***ONE OF THESE TWO COURSES:	
CIS480	Software Development Capstone	3
CIS490	Bachelor's Externship-CIS	3
	***ONE LECTURE COURSE AND CORRESPONDING LAB FROM THE FOLLOWING:	
CIS435	SQL Server	3
CIS435L	SQL Server LAB	1
	OR	
CIS436	Oracle PL/SQL	3
CIS436L	Oracle PL/SQL LAB	1

Data Analytics track

14 semester credit hours

CIS326	Introduction to Data Analytics	3
CIS367	Advanced Server Side Scripting with PHP II	3
CIS376	Data Analytics Tools	3
CIS469	Data Analytics Methods and Modeling	3
CIS469L	Data Analytics Methods and Modeling LAB	1
CIS473L	Advanced Data Analytics LAB	1

Mobile Development Track

14 semester credit hours

CIS367	Advanced Server Side Scripting with PHP II	3
CIS432	Mobile App Development II	3
CIS494	Externship-CIS Sr. II	2
	***ONE OF THESE TWO COURSES:	
CIS214	Object-Oriented Programming Using C#	3
CIS218	Object-Oriented Programming Using JAVA	3
	***ONE OF THESE TWO COURSES:	
CIS317	Advanced Object-Oriented Programming Using C#	3
CIS319	Advanced Object-Oriented Programming Using Java	3

Web Design and Development Track

14 semester credit hours

CIS334	Interface Design I	3
CIS334L	Interface Design I LAB	1
CIS360	Web Application Development	3
CIS367	Advanced Server Side Scripting with PHP II	3
CIS453	Interface Design II	3
CIS453L	Interface Design II LAB	1

Elective Courses

14 semester credit hours

CIS101	Computer Configuration I	3
CIS214	Object-Oriented Programming Using C#	3
CIS218	Object-Oriented Programming Using JAVA	3
CIS242	AWS Academy Cloud Foundations	3
CIS317	Advanced Object-Oriented Programming Using C#	3
CIS319	Advanced Object-Oriented Programming Using Java	3
CIS326	Introduction to Data Analytics	3
CIS334	Interface Design I	3
CIS334L	Interface Design I LAB	1
CIS360	Web Application Development	3
CIS367	Advanced Server Side Scripting with PHP II	3
CIS376	Data Analytics Tools	3
CIS420	Systems Analysis and Design	3
CIS432	Mobile App Development II	3
CIS435	SQL Server	3
CIS435L	SQL Server LAB	1
CIS453	Interface Design II	3
CIS453L	Interface Design II LAB	1
CIS469	Data Analytics Methods and Modeling	3

CIS469L	Data Analytics Methods and Modeling LAB	1
CIS473L	Advanced Data Analytics LAB	1
CIS490	Bachelor's Externship-CIS	3
CIS491	Externship-CIS Sr. I-a	1
CIS492	Externship-CIS Sr. I-b	1
CIS493	Externship-CIS Sr. I-c	1
CIS494	Externship-CIS Sr. II	2
CIS496	CIS Externship Project	1