4+1 COMPUTER SCIENCE BS/CYBERSECURITY MS

Curriculum

Computer Science BS Interdisciplinary Track

Code	Title	Credits
CSC 111 & 111L	Introduction to Programming and Introduction to Programming Laboratory	4
CSC 112 & 112L	Data Structures and Data Structures Laboratory	4
CSC 213 & 213L	Large Scale Programming and Large Scale Programming Laboratory	4
CSC 253 & 253L	Computer Hardware and Computer Hardware Laboratory	4
CSC 281	Automata and Algorithms	3
CSC 310 & 310L	Information Organization and Processing and Information Organization and Processing Laboratory	4
CSC 320	The Social Impact of Computing	3
CSC 330 & 330L	Operating System Design and Distributed Computing and Operating System Design and Distributed Computing Laboratory	4
CSC 351 & 351L	Comparative Programming Languages and Comparative Programming Languages Laboratory	4
CSC 380 & 380L	Web Development I and Web Development I Laboratory	4
CSC 395 & 395L	Software Engineering and Software Engineering Lab	4
Major Elective at the 300-or 400-level (see list below)		3-4
MAT 111	Calculus I	4
MAT 191	Discrete Mathematics I	4
Interdisciplinary Track		
Completion of an approved major or minor in another department or program		

Major Elective Options

One additional course at the 300/400 level is required. These courses cover a variety of topics including web programming, advanced object oriented programming and design patterns, and ~~cryptography, app development, graphics,~~ numerical analysis. Independent studies on specialized topics are also possible electives. ~~analysis and bioinformatics.~~ All these courses are either 3 or 4 credits. Faculty teach these courses on a rotating basis. To determine what is offered each semester consult the class schedule. Recent major electives include:

Code	Title	Credits
CSC 360 & 360L	Intelligent Systems and Intelligent Systems Laboratory	4
CSC 381 & 381L	Web Development II and Web Development II Laboratory	4
MAT 341	Numerical Analysis	3
MAT 342	Graph Theory	3

Computer Science BS Science Track

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CSC 111 & 111L	Introduction to Programming and Introduction to Programming Laboratory	4
CSC 112 & 112L	Data Structures and Data Structures Laboratory	4
CSC 213 & 213L	Large Scale Programming and Large Scale Programming Laboratory	4
CSC 253 & 253L	Computer Hardware and Computer Hardware Laboratory	4
CSC 281	Automata and Algorithms	3
CSC 310 & 310L	Information Organization and Processing and Information Organization and Processing Laboratory	4
CSC 320	The Social Impact of Computing	3
CSC 330 & 330L	Operating System Design and Distributed Computing and Operating System Design and Distributed Computing Laboratory	4
CSC 351 & 351L	Comparative Programming Languages and Comparative Programming Languages Laboratory	4
CSC 380 & 380L	Web Development I and Web Development I Laboratory	4
CSC 395 & 395L	Software Engineering and Software Engineering Lab	4
Major Elective at 300 or 400 level (see list below)		3-4
MAT 111	Calculus I	4
MAT 112	Calculus II	4
MAT 191	Discrete Mathematics I	4
Select one of the following sequences:		8
Biology Sequence		
BIO 111 & 111L	Introductory Biology I and Introductory Biology Laboratory I	
BIO 112 & 112L	Introductory Biology II and Introductory Biology Laboratory II	
Chemistry Sequence:		
CHM 111 & 111L	General Chemistry I and General Chemistry I Laboratory	
CHM 112 & 112L	General Chemistry II and General Chemistry II Laboratory	
Physics Sequence:		
PHY 223 & 223L	General Physics for Physical Science Majors I and General Physics for Physical Science Majors I Laboratory	
PHY 224 & 224L	General Physics for Physical Science Majors II and General Physics for Physical Science Majors II Laboratory	
Total Credits		**65-66**

Major Elective Options

One additional course at the 300/400 level is required. These courses cover a variety of topics including web programming, advanced object oriented

programming and design patterns, and ~~cryptography, app development, graphics,~~ numerical analysis. Independent studies on specialized topics are also possible electives. ~~analysis and bioinformatics.~~ All these courses are either 3 or 4 credits. Faculty teach these courses on a rotating basis. To determine what is offered each semester consult the class schedule. Recent major electives include:

Code	Title	Credits
CSC 360 & 360L	Intelligent Systems and Intelligent Systems Laboratory	4
CSC 381 & 381L	Web Development II and Web Development II Laboratory	4
MAT 341	Numerical Analysis	3
MAT 342	Graph Theory	3
DAT 511	Data Stewardship: Preparation, Exploration and Handling of Big Data	
DAT 514 & MAT 500	Data Mining and Machine Learning and Topics in Applied Mathematics (The combination of these two courses fulfills the elective credits)	
Total Credits		**36**

Graduate Requirements for Cybersecurity MS

Code	Title	Credits
Foundation Courses (can be waived at the program director's discretion)		
CSC 511 & 511L	Introduction to Programming and Introduction to Programming Lab	3
CSC 512 & 512L	Data Structures and Algorithms and Data Structures and Algorithms Lab	3
Required Courses		
CSC 610 & 610L	Database Management and Database Management Lab	3
CYB 500 & 500L	Cybersecurity Principles and Cybersecurity Principles Lab	3
CYB 510	Cybersecurity Policies, Ethics, and Law	3
CYB 520 & 520L	Ethical Hacking and Penetration Testing and Ethical Hacking and Penetration Testing Lab	3
CYB 540 & 540L	Network and Internet Security and Network and Internet Security Lab	3
CYB 600 & 600L	Secure Software Engineering and Secure Software Engineering Lab	3
CYB 610	Cybersecurity Project	3
Choose from the following (9 credit hours):		**9**
CYB 505	Capture the Flag & Cybersecurity	
CYB 506	Cybersecurity Certification Preparation	
CYB 550 & 550L	Techniques to Analyze and Evaluate Malware and Techniques to Analyze and Evaluate Malware Lab	
CYB 580	Cybersecurity Seminar	
CYB 599 & 599L	Cybersecurity Special Topics and Cybersecurity Special Topics Lab	
CYB 611	Cybersecurity Thesis	
CYB 620 & 620L	Applied Cryptography and Applied Cryptography Lab	
CYB 655 & 655L	Cybersecurity Operations and Cybersecurity Operations Lab	
CYB 680	Cybersecurity Research	
CYB 697	Cybersecurity Internship	
CYB 699	Advanced Cybersecurity Topics	

Roadmap

Recommended Undergraduate Semester Schedule for Major Course Requirements

Freshman

Fall	Spring
CSC 111 & 111L	CSC 112 & 112L[1]
MAT 191[1]	MAT 111
	Track course

Sophomore

Fall	Spring
CSC 253 & 253L	CSC 281
CSC 213	Track course
CSC 213L	

Junior

Fall	Spring
CSC 330 & 330L	CSC 351 & 351L
CSC 380 & 380L	Track course
Track course	

Senior

Fall	Spring
CSC 310 & 310L[1]	CSC 320
CSC 395 & 395L	CYB 520 & 520L[2]
CYB 500 & 500L[2]	CSC Elective, if needed
CSC Elective, If needed	Track course, if needed

[1] Undergraduate major classes (CSC 310 will waive the course but you will need an additional graduate level class)
- CSC 111 & CSC 111L waives CSC 511 & CSC 511L
- CSC 112 & CSC 112L waives CSC 512 & CSC 512L
- CSC 310 & CSC 310L waives CSC 610 & CSC 610L

[2] Graduate level classes (up to 6 credits)
- CYB 500 & CYB 500L
- CYB 520 & CYB 520L

Any course with CYB prefix taken for computer science undergraduate credit will not count towards the graduate degree