MAJOR IN COMPUTER SCIENCE - CYBER OPERATIONS TRACK

Requirements

The Computer Science major with a track in Cyber Operations requires 87–88 units. A minimum of 30 major units must be taken at Towson University.

Code	Title	Units		
Required Computer S	cience Courses			
CIS 377	INTRODUCTION TO CYBERSECURITY	3		
COSC 236	INTRODUCTION TO COMPUTER SCIENCE I 1, 2	4		
COSC 237	INTRODUCTION TO COMPUTER SCIENCE II 2	4		
COSC 290	PRINCIPLES OF COMPUTER ORGANIZATION	4		
COSC 336	DATA STRUCTURES AND ALGORITHM ANALYSIS	4		
COSC 350	DATA COMMUNICATIONS AND NETWORKING	3		
COSC 412	SOFTWARE ENGINEERING	3		
COSC 439	OPERATING SYSTEMS	3		
COSC 455	PROGRAMMING LANGUAGES: DESIGN & IMPLEMENTATION	3		
COSC 457	DATABASE MANAGEMENT SYSTEMS	3		
Required Math Cours	es			
MATH 263	DISCRETE MATHEMATICS	3-4		
or MATH 267	INTRODUCTION TO ABSTRACT MATHEMATI	CS		
MATH 273	CALCULUS I	4		
MATH 274	CALCULUS II	4		
MATH 314	INTRODUCTION TO CRYPTOGRAPHY	3		
MATH 330	INTRODUCTION TO STATISTICAL METHODS	4		
Required Cyber Operations Track Courses				
COSC 340	SYSTEMS PROGRAMMING	3		
COSC 440	OPERATING SYSTEMS SECURITY	3		
COSC 450	NETWORK SECURITY	3		
COSC 458	APPLICATION SOFTWARE SECURITY	3		
COSC 481	CASE STUDIES IN COMPUTER SECURITY	3		
COSC 485	REVERSE ENGINEERING AND MALWARE ANALYSIS	3		
Science Requirement				
Select two lab science courses from the following (the courses 8				
do not need to form a sequence):				
BIOL 200	BIOLOGY I: INTRODUCTION TO CELLULAR			
& 200L	BIULUGY AND GENETICS [LECTURE]			
	CELLULAR BIOLOGY AND GENETICS [LAB]			

Total Units		87-88
ENGL 317	WRITING FOR BUSINESS AND INDUSTRY (Core 9)	3
COSC 418	ETHICAL AND SOCIETAL CONCERNS OF COMPUTER SCIENTISTS (Core 14)	3
COMM 131	PUBLIC SPEAKING (Core 5)	3
Must be completed with a grade equivalent of 2.00 or higher.		
Other Requirements		
PHYS 242	GENERAL PHYSICS II CALCULUS-BASED	
PHYS 241	GENERAL PHYSICS I CALCULUS-BASED	
GEOL 121	PHYSICAL GEOLOGY	
CHEM 132 & 132L	GENERAL CHEMISTRY II LECTURE and GENERAL CHEMISTRY II LABORATORY	
CHEM 131 & 131L	GENERAL CHEMISTRY I LECTURE and GENERAL CHEMISTRY I LABORATORY	
BIOL 206 & 206L	BIOLOGY II: INTRODUCTION TO ECOLOGY AND EVOLUTION [LECTURE] and BIOLOGY II: INTRODUCTION TO ECOLOGY AND EVOLUTION [LAB]	

¹ COSC 175 is a prerequisite for COSC 236.

² COSC 236 and COSC 237, or their equivalents, must be taken at the same institution.

Four-Year Plan of Study Sample Four-Year Plan

The selected course sequence below is an example of the simplest path to degree completion. Based on course schedules, student needs, and student choice, individual plans may vary. Students should consult with their adviser to make the most appropriate elective choices and to ensure that they have completed the required number of units (120) to graduate.

Freshman Term 1 Units Term 2 Units COMM 131 (Core 5) 3 COSC 237² 4 COSC 236^{1, 2} 4 4 MATH 274 MATH 273 (Core 3) 4 Lab-Science (from approved 4 list) (Core 7) Core 1 (or Core 2) 3 Core 2 (or Core 1) 3 14 15 Sophomore Term 1 Units Term 2 Units COSC 336 4 CIS 377 3 3 COSC 290 MATH 263 or 267 4 Lab-Science (from approved 4 COSC 412 3 list) (Core 8) 3 MATH 330 4 Core 4 Elective 3 Core 6 3 17 17 Junior Units Term 1 Units Term 2 COSC 340 3 COSC 439 3 **COSC 350** 3 COSC 455 3 ENGL 317 (Core 9) 3 COSC 457 3

MATH 314	3 Core 10	3
Elective	3 Core 13	3
	15	15
Senior		
Term 1	Units Term 2	Units
COSC 440	3 COSC 418 (Core 14)	3
COSC 450	3 COSC 481	3
COSC 458	3 COSC 485	3
Core 11	3 Elective	3
Core 12	3	
	15	12

Total Units 120

- ¹ COSC 175 and (MATH 119 or MATH 231 or a qualifying score in the Math placement test) is needed as a prerequisite to COSC 236.
- ² COSC 236 and COSC 237 must be taken together at the same institution.

Learning Outcomes

- 1. 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.
- 3. Communicate effectively in a variety of professional contexts.
- Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
- 5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
- 6. Apply computer science theory and software development fundamentals to produce computing-based solutions.
- 7. Apply security principles and practices to maintain operations in the presence of risks and threats.