

MAJOR IN COMPUTER SCIENCE

Requirements

The Computer Science major requires 81-83 units. A minimum of 30 major units must be taken at Towson University. Students cannot double major in Computer Science and Computer Information Systems, or in Computer Science and Information Technology.

Code	Title	Units
Required Computer Science Courses		
CIS 377	INTRODUCTION TO CYBERSECURITY	3
COSC 236	INTRODUCTION TO COMPUTER SCIENCE I ¹	4
COSC 237	INTRODUCTION TO COMPUTER SCIENCE II	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 Courses		
MATH 263 or MATH 267	DISCRETE MATHEMATICS INTRODUCTION TO ABSTRACT MATHEMATICS	3-4
MATH 273	CALCULUS I	4
MATH 274	CALCULUS II	4
MATH 330	INTRODUCTION TO STATISTICAL METHODS	4
Elective Computer Science Courses		
Select at least two of the following:		6
COSC 417	INTRODUCTION TO THE THEORY OF COMPUTING	
COSC 432	REQUIREMENTS ANALYSIS & MODELING	
COSC 436	OBJECT-ORIENTED DESIGN & PROGRAMMING	
COSC 459	COMPUTER SIMULATION & MODELING	
COSC 461	ARTIFICIAL INTELLIGENCE	
COSC 467	FOUNDATIONS OF DATA MINING	
COSC 471	COMPUTER GRAPHICS	
COSC 483	DESIGN & ANALYSIS ALGORITHMS	
Select at least two of the following:		6
COSC 397 or COSC 495	INTERNSHIP IN COSC INDEPENDENT STUDY	
COSC 431	SELECTED TOPICS COMPUTER SCIENCE	
COSC 435	MOBILE APPLICATION DEVELOPMENT	
COSC 440	OPERATING SYSTEMS SECURITY	
COSC 442	SOFTWARE QUALITY ASSURANCE AND TESTING	

COSC 450	NETWORK SECURITY	
COSC 458	APPLICATION SOFTWARE SECURITY	
COSC 465	ROBOTICS	
COSC 484	WEB-BASED PROGRAM	
Science Requirement		
Select two lab science courses from the following (the courses do not need to form a sequence):		8
BIOL 200 & 200L	BIOLOGY I: INTRODUCTION TO CELLULAR BIOLOGY AND GENETICS [LECTURE] and BIOLOGY I: INTRODUCTION TO CELLULAR BIOLOGY AND GENETICS [LAB]	
BIOL 206 & 206L	BIOLOGY II: INTRODUCTION TO ECOLOGY AND EVOLUTION [LECTURE] and BIOLOGY II: INTRODUCTION TO ECOLOGY AND EVOLUTION [LAB]	
CHEM 131 & 131L	GENERAL CHEMISTRY I LECTURE and GENERAL CHEMISTRY I LABORATORY	
CHEM 132 & 132L	GENERAL CHEMISTRY II LECTURE and GENERAL CHEMISTRY II LABORATORY	
GEOL 121	PHYSICAL GEOLOGY	
PHYS 241	GENERAL PHYSICS I CALCULUS-BASED	
PHYS 242	GENERAL PHYSICS II CALCULUS-BASED	
Elective Math Course		
Select one from the following:		3-4
MATH 265	ELEMENTARY LINEAR ALGEBRA	
MATH 275	CALCULUS III	
MATH 314	INTRODUCTION TO CRYPTOGRAPHY	
MATH 315	APPLIED COMBINATORICS	
MATH 369	INTRODUCTION TO ABSTRACT ALGEBRA	
MATH 374	DIFFERENTIAL EQUATIONS	
MATH 377	MATHEMATICAL MODELS	
MATH 378	EXPERIMENTAL MATHEMATICS	
MATH 435	NUMERICAL ANALYSIS I	
MATH 437	OPERATIONS RESEARCH	
MATH 451	GRAPH THEORY	
Other Requirements		
Must be completed with a grade equivalent of 2.00 or higher.		
COMM 131	PUBLIC SPEAKING (Core 5)	3
COSC 418	ETHICAL AND SOCIETAL CONCERNS OF COMPUTER SCIENTISTS (Core 14)	3
ENGL 317	WRITING FOR BUSINESS AND INDUSTRY (Core 9)	3
Total Units		81-83

¹ COSC 175 is a prerequisite for COSC 236.

Four-Year Plan of Study

Suggested Four-Year Plan

Based on course availability and student needs and preferences, the selected sequences will probably vary from those presented below. Students should consult with their adviser to make the most appropriate elective choices.

Freshman

Term 1	Units Term 2	Units
COMM 131 (Core 5)	3 COSC 237	4
COSC 236 ¹	4 MATH 274	4
MATH 273 (Core 3)	4 Lab-Science (from approved list) (Core 7)	4
Core 1 (or Core 2)	3 Core 2 (or Core 1)	3
	14	15

Sophomore

Term 1	Units Term 2	Units
COSC 336	4 COSC 290	4
MATH 263 or 267	3 COSC 412	3
Lab-Science (from approved list) (Core 8)	4 MATH 330	4
Core 6	3 Core 10	3
Core 12	3	
	17	14

Junior

Term 1	Units Term 2	Units
CIS 377	3 COSC 439	3
COSC 350	3 COSC 455	3
COSC 457	3 Math Elective	4
ENGL 317 (Core 9)	3 Core 13	3
Core 11	3 Elective	3
	15	16

Senior

Term 1	Units Term 2	Units
COSC Elective (from approved list)	3 COSC 418 (Core 14)	3
COSC Elective (from approved list)	3 COSC Elective (from approved list)	3
Core 4	3 COSC Elective (from approved list)	3
Elective	3 Elective	3
Elective	2 Elective	3
	14	15

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.

- f. An ability to apply theory in the design and implementation of computer-based solutions.
- g. An ability to reason about and explain computer-based solutions at multiple levels of abstraction.

Learning Outcomes

- a. An ability to analyze a problem, and to identify and define the computing requirements appropriate to its solution.
- b. An ability to design, implement, and evaluate a computer-based solution to meet a given set of computing requirements in the context of the discipline.
- c. An ability to communicate effectively with a range of audiences about technical information.
- d. An ability to make informed judgments in computing practice based on legal and ethical principles.
- e. An ability to function effectively on teams to establish goals, plan tasks, meet deadlines, manage risk and produce deliverables.