MAJOR IN COMPUTER SCIENCE - SOFTWARE ENGINEERING TRACK

Requirements

The Computer Science major with a track in Software Engineering requires 87–89 units. A minimum of 30 major units must be taken at Towson University.

Code	Title	Units
Required Computer Science 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 Software Engineering Track Courses		
COSC 432	REQUIREMENTS ANALYSIS & MODELING	3
COSC 436	OBJECT-ORIENTED DESIGN & PROGRAMMING	3
COSC 442	SOFTWARE QUALITY ASSURANCE AND TESTING	3
COSC 490	SOFTWARE PROJECT PRACTICUM	3
Elective Software Engineering Courses		
Select two of the following:		6
COSC 397	INTERNSHIP IN COSC	
COSC 435	MOBILE APPLICATION DEVELOPMENT	
COSC 484	WEB-BASED PROGRAM	
Required Math Courses		
MATH 263	DISCRETE MATHEMATICS	3-4
or MATH 267	INTRODUCTION TO ABSTRACT MATHEMATICS	
MATH 273	CALCULUS I	4
MATH 274	CALCULUS II	4
MATH 330	INTRODUCTION TO STATISTICAL METHODS	4
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 math course from the list below:		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		**87-89**

[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
COSC 236[1, 2]	4	COSC 237[2]	4
MATH 273 (Core 3)	4	MATH 274	4
Lab-Science (from approved list) (Core 7)	4	Lab-Science (from approved list) (Core 8)	4
Core 1 (or Core 2)	3	Core 2 (or Core 1)	3
	15		**15**

Sophomore

Term 1	Units	Term 2	Units
CIS 377	3	COSC 290	4
COMM 131 (Core 5)	3	COSC 412	3
COSC 336	4	MATH 330	4
MATH 263 or 267	3	Core 4	3
		Elective	3
	13		**17**

Junior

Term 1	Units	Term 2	Units
COSC 350	3	COSC 455	3
COSC 436	3	COSC 457	3
COSC 439	3	COSC 418 (Core 14)	3
ENGL 317 (Core 9)	3	MATH Elective	3
Core 6	3	Core 10	3
	15		**15**

Senior

Term 1	Units	Term 2	Units
COSC 432	3	COSC 442	3
Software Engineering Track Elective (from approved list)	3	COSC 490	3
Core 11	3	Software Engineering Track Elective (from approved list)	3
Core 12	3	Core 13	3
Elective	3	Elective	3
	15		**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.

[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.
2. 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.
4. 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.