MAJOR IN COMPUTER & MATHEMATICAL SCIENCES - SECONDARY EDUCATION CONCENTRATION

Computer and Mathematical Sciences majors in the Secondary Education concentration are eligible, upon graduation, to apply to receive certification to teach both computer science and mathematics for grades 7-12 in the state of Maryland.

The Computer and Mathematics Secondary Education concentration requires 127 units for completion. Students must complete 62 required units in content courses, 25 required units in Towson UTeach courses, 28 required units in Core Curriculum courses not satisfied by the major, and 12 required units in their final internship, earning a grade equivalent of 2.00 or higher in each course.

Teacher Candidacy

The Teacher Education Executive Board, representing all initial teacher education programs at Towson University, utilizes the following **minimum** requirements as conditions for admission into teacher education programs, maintaining candidate status and formal entry into the capstone internship. Programs may include additional requirements for admission into the program and/or the capstone internship.

The College of Education admits students either as freshmen or as undergraduate transfer students from accredited, post-secondary institutions. During the freshman and sophomore years, students are generally engaged in pre-professional courses or courses that fulfill Core Curriculum requirements, as well as all identified prerequisites (e.g., specific and sequential courses in Core Curriculum) for admission to COE screened majors and programs.

All College of Education undergraduate programs are screened majors. As an integral part of the teaching/learning experience, students work with advisers in a strategic planning process across all years at TU. Accordingly, to support student success, all COE students are required to confer prior to registration each term with their assigned advisers.

I. PROCEDURES AND REQUIREMENTS FOR ADMISSION TO ALL TEACHER EDUCATION PROGRAMS

1. Complete a self-disclosure criminal background form to be submitted to the major department with the application.
2. Submit an application for formal admission to the program. Students seeking admission to teacher education programs must contact their department chairperson or program coordinator by 45 credit hours for program-specific procedures and requirements for admission to professional education programs.
3. A cumulative/overall GPA of 3.00 or higher is required for admission to an initial licensure teacher education program.
    i. Applicants with a GPA between 2.50 - 2.99 may be admitted conditionally if they provide evidence of passing scores on a Basic Skills Assessment* as identified by the Maryland State Department of Education (i.e. SAT, ACT, GRE, Praxis Core) and receive approval from the department chairperson/program coordinator.

**Candidates may apply for a test waiver directly to the department. Such waivers should only be granted if it is predicted, based on the individual candidate's transcript data, that the candidate's final cumulative/overall GPA will be above a 3.00.*

II. REQUIREMENTS FOR MAINTAINING CANDIDATE STATUS

A. Maintain a semester GPA of 3.00 in required education courses for all programs.
    i. At the department's discretion, candidates who do not meet the above GPA requirement may continue for one additional semester under probationary status, but must meet the 3.00 GPA requirement at the end of the probationary period. If the GPA requirement is not met at the end of the probationary period, the candidate would be dismissed from the program.
B. Obtain a grade of C or better in academic major course work applicable only in programs requiring an academic major. (Middle School; Secondary; Art, Dance, Health, Music, World Languages, Physical Education).
C. Exhibit behavior that is consistent with the University's Code of Student Conduct, the Educator Preparation Program's Professional Behavior Policy, and established professional practice in educational and clinical settings. (see COE Behavior Policy)

III. PROCEDURES AND REQUIREMENTS FOR ENTRY INTO CAPSTONE INTERNSHIP FOR ALL PROFESSIONAL EDUCATION PROGRAMS.

A. Complete a criminal background check as required by the school system in which the internship is located.
B. Complete all required course work.

The Standards were revised and approved in February 1996, May 1998, February 2000, May 2007, May 2008, April 2009, December 2011, November 2012, February 2014, October 2014, February 2015, November 2015, May 2019, February 2020, and March 2021.

Requirements

All Computer and Mathematical Sciences majors are required to complete 37 units of shared major course work in addition to the requirements for the concentration, for a total of 93-100 units.

Computer and Mathematical Sciences Major Requirements

Code	Title	Units
Required Major Courses		
CIS 377	INTRODUCTION TO CYBERSECURITY	3
COSC 236	INTRODUCTION TO COMPUTER SCIENCE I	4
COSC 237	INTRODUCTION TO COMPUTER SCIENCE II	4
COSC 336	DATA STRUCTURES AND ALGORITHM ANALYSIS	4
COSC 412	SOFTWARE ENGINEERING	3
COSC 418	ETHICAL AND SOCIETAL CONCERNS OF COMPUTER SCIENTISTS	3
MATH 265	ELEMENTARY LINEAR ALGEBRA	4
MATH 273	CALCULUS I	4
MATH 274	CALCULUS II	4
MATH 275	CALCULUS III	4
Total Units		**37**

Secondary Education Concentration

Code	Title	Units
Required Computer Science & Mathematics Courses		
COSC 109	COMPUTERS AND CREATIVITY	3
COSC 482	TEACHING COMPUTER SCIENCE IN THE SECONDARY SCHOOLS	3
ITEC 250	FUNDAMENTALS OF COMPUTER NETWORKS	3
MATH 263	DISCRETE MATHEMATICS	3
or MATH 267	INTRODUCTION TO ABSTRACT MATHEMATICS	
MATH 310	FUNCTIONS AND MODELING FOR SECONDARY SCHOOL TEACHERS	3
MATH 330	INTRODUCTION TO STATISTICAL METHODS	4
MATH 353	EUCLIDEAN AND NON-EUCLIDEAN GEOMETRIES	3
MATH 423	TEACHING MATHEMATICS IN THE SECONDARY SCHOOLS	3
Total Units		**25**

Towson UTeach Course Requirements

Code	Title	Units
SEMS 110 & SEMS 120	INTRODUCTION TO STEM TEACHING I: INQUIRY APPROACHES TO TEACHING and INTRODUCTION TO STEM TEACHING II: INQUIRY-BASED LESSON DESIGN [1]	2
or SEMS 130	INTRODUCTION TO STEM TEACHING I & II COMBINED	
SEMS 230	KNOWING AND LEARNING	3
Foundation Courses		
SEMS 240		3
SEMS 250	PERSPECTIVES IN SCIENCE AND MATHEMATICS	3
Requirements Open to Formally Admitted Students		
SCED 460	USING LITERACY IN THE SECONDARY SCHOOLS	3
SCED 461	TEACHING LITERACY IN THE SECONDARY CONTENT AREAS	3
SEMS 370	PROJECT-BASED INSTRUCTION	3
SEMS 430	SEMINAR IN APPRENTICE TEACHING	1
SEMS 498	INTERNSHIP IN MATHEMATICS AND SCIENCE SECONDARY EDUCATION	3
COSC 492	INTERNSHIP IN SECONDARY EDUCATION - COMPUTER SCIENCE	6
MATH 426	INTERNSHIP IN SECONDARY EDUCATION - MATHEMATICS	6-12
Total Units		**36-42**

[1] Permission of Towson UTeach Department required to take SEMS 130.

Four-Year Plan

Secondary Education Concentration 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 109 (Core 4)	3 COSC 236	4
MATH 273	4 MATH 274 (Core 3)	4
SEMS 110	1 SEMS 120	1
Core 1 (or Core 2)	3 Core 2 (or Core 1)	3
Core 6	3 Core 7	4
	14	**16**

Sophomore

Term 1	Units Term 2	Units
COSC 237	4 COSC 336	4
MATH 265	4 MATH 263 or 267	3
SEMS 230	3 SEMS 240	3
Core 8	4 Core 11	3
Core 10	3 Core 12	3
	18	**16**

Junior

Term 1	Units Term 2	Units
CIS 377	3 SEMS 370	3
ITEC 250	3 SCED 460	3
MATH 275	4 MATH 310 (Core 9)	3
MATH 353	3 COSC 412	3
SEMS 250 (Core 5)	3 Core 13	3
	16	**15**

Senior

Term 1	Units Term 2	Units
COSC 418 (Core 14)	3 COSC 492	6
COSC 482	3 MATH 426	6-12
MATH 330	4 SEMS 430	1
MATH 423	3	
SCED 461	3	
SEMS 498	3	
	19	**13-19**

Total Units 127-133

Learning Outcomes

Computer Science Learning Objectives

Student Learning Outcomes by Course Level:

1. An ability to analyze a problem, and to identify and define the computing requirements appropriate for its solution.
2. 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.

3. An ability to communicate effectively with a range of audiences about technical information.
4. An ability to make informed judgments in computing practice based on legal and ethical principles.
5. An ability to function effectively on teams to establish goals, plan tasks, meet deadlines, manage risk, and produce deliverables.
6. An ability to apply theory in the design and implementation of computer-based solutions.
7. An ability to reason about and explain computer-based solutions at multiple levels of abstraction.

Mathematics Learning Objectives

Student Learning Outcomes by Course Level:

1. Demonstrate knowledge of the properties of numbers and sets.
2. Demonstrate skills and knowledge of appropriate technology used in solving mathematical problems.
3. Demonstrate skills and knowledge of the basic concepts of calculus.
4. Demonstrate skills and knowledge of linear and abstract algebra.
5. Demonstrate skills and knowledge of basic probability and/or statistics.