

MEMORANDUM OF UNDERSTANDING
COMMUNITY COLLEGE OF BALTIMORE COUNTY & TOWSON
UNIVERSITY

October, 2018

COMPUTER SCIENCE B.S. Degree

Community College of Baltimore County, Catonsville, Maryland, and Towson University, agree to follow the articulation of courses outlined in the articulation (course equivalency) document, for completion of requirements for the Bachelor of Science degree in Computer Science (Attachment A), which is attached to, and incorporated by reference into, this Memorandum of Understanding (MOU). The following principles guide the operation of this MOU, with the requirements for transfer in specific curricula set forth in Attachment A.

1. Towson University will accept a maximum number of 64 credits from Community College of Baltimore County as outlined in the Attachment A. The number of transferable credits specific to this program is reflected in Attachment A.
2. Students who have completed the Associate of Science Degree in the Computer Science program at Community College of Baltimore County may transfer into Towson University's Computer Science program with junior standing provided that the student has completed all courses identified on Attachment A (which is attached to, and incorporated by reference into, this MOU) with a cumulative GPA of 2.00 or higher. Courses completed at Community College of Baltimore County with 300 or 400 level Towson University course equivalencies will transfer as lower-level credit but will satisfy course content as indicated.
3. Only courses in which a grade of C (2.00) or better is earned will apply toward the major at Towson University.
4. In accordance with the MHEC transfer policy pertaining to general education requirements, Towson University will accept the completion of Community College of Baltimore County's general education requirements (GenEds) and students will be required to complete courses at Towson University to satisfy the remaining *University Core* requirements as shown in Attachment A.
5. Towson University recognizes college-level experiential learning gained through previous work, military and/or volunteer service or life experience. Credit for prior learning may also be established through course challenge or standardized credit by examination.
6. Community College of Baltimore County students transferring to Towson University will be given every consideration for financial aid and will be eligible to compete for academic scholarships upon entrance to Towson University subject to stated scholarship deadlines.
7. Both Community College of Baltimore County and Towson University agree to work together to facilitate the transfer of students from Community College of Baltimore

County to Towson University to work cooperatively to insure the high quality of the programs at the respective institutions. Transfer of students will be in accordance with policies and procedures of both institutions, as they may be amended from time to time.

8. This MOU will be in effect initially for five years, beginning *fall 2018*, with a review every two years by both parties. Any revisions the parties deem necessary must be evidenced in writing and signed by the authorized officials of each institution. The MOU may be terminated by either party for due cause and after adequate notice of not less than six months is given to the other party.
9. Towson University will establish procedures to provide information on the academic progress of Community College of Baltimore County students enrolled as part of this MOU.
10. This MOU, when signed, constitutes the entire agreement between the parties and supersedes all prior agreements and understandings between the parties respecting the matter hereof.

Community College of Baltimore County (CCBC) – Computer Science A.S. Degree
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COMMUNITY COLLEGE OF BALTIMORE COUNTY			TOWSON UNIVERSITY		
COURSE #	COURSE TITLE	CRS.	TU EQUIVALENCY	COMMENTS	COURSE ID#
General Education Applied to CORE					
				Towson Seminar Waived	13192
ENGL 101	Composition (E)	3	ENGL 102		2348
MATH 251	Calculus I (M)	4	MATH 273	Satisfies Required Math Course for major at TU	4407
CSIT 111	Logic and OO Design (I)	3	COSC 175		1335
CMNS 101	Fundamentals of Communication (A) *	3	COMM 131	Satisfies Other Requirement for major at TU	1221
GENED AH	Arts & Humanities General Education (A)**	3	Depends On Choice		
GENED S/BS	Social and Behavioral Science Gen Ed (S)**	3	Depends On Choice		
GENED S/BS	Social and Behavioral Science Gen Ed (S) **	3	Depends On Choice		
GENED BPS	Biol/Chem/Phys Biol & Phys Sci Gen Ed (B) *	4	Depends On Choice		
GENED BPS	Biol/Chem/Phys Biol & Phys Sci Gen Ed (B) *	4	Depends On Choice		
ENGL 102	College Composition II (E) (program elective)*	3	ENGL TLL		10267
MATH 243	Discrete Mathematics (M)	3	MATH 263	Satisfies Required Math Course for major at TU	4401
MATH 257	Linear Algebra (M)	4	MATH 265		4403
Units Applied to TU Core		40			
CSIT 210	Introduction to Programming	4	COSC 236	Satisfies Required Computer Science Course for major at TU. BOTH CSIT 210 & 211 MUST BE COMPLETED TO RECEIVE CREDIT FOR COSC 236 & COSC 237. IF ONLY ONE COURSE IS COMPLETED STUDENT WILL RECEIVE ELECTIVE CREDIT AND MUST TAKE BOTH COSC 236 AND 237 AT TU.	1344
CSIT 211	Advanced Programming	4	COSC 237		1345
MATH 252	Calculus II	4	MATH 274	Satisfies Required Math Course for major at TU	4408
CSIT 214	C++ Programming	4	COSC TLL	equivalent to COSC 175, transfers as COSC TLL for this agreement	10186
PROG ELECT	Program Elective	4	Depends On Choice		
ACDV 101	Academic Development: Transition (SEE NOTE)	(1)	NT	NOT TRANSFERABLE	
Program Requirements Applied		20			
Total Degree Requirements at CCBC		60-61			
Maximum Units in Transfer		64	Core Transfer Package AACR 400 (13065)		

* Students should choose specific courses in order to satisfy CCBC requirements toward A.S. degree, and to satisfy TU major and Core Curriculum requirements. See page 2 for details.

**One General Education course from Arts and Humanities or Social and Behavioral Sciences General Education categories must be a diversity (D) course.

NOTE: Credit students who are new to college (have not successfully completed transferable college credits from other institutions) are required to take ACDV 101 – Academic Development – Transitioning to college. This 1-credit course is designed to be taken in the first semester at CCBC. Students must provide an official transcript(s) from an accredited institution to document successful completion of college coursework for the ACDV 101 requirement to be waived.

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CCBC Course Selections:**General education:**

1. **Two LAB** science courses in the Biology, Chemistry or Physics disciplines are required for the computer science major at TU. Students should choose from the following General Education courses at CCBC in order to satisfy the General Education requirements at CCBC and the Core and Major requirements at TU: **ASTM 101 and 102; BIOL 110 and 111; CHEM 131; ERSC 121; PHYS 151 and 152**. If both lab courses are taken in the same discipline, courses must be sequential as listed above. Students who do not take these courses as specified at CCBC *may need to complete additional lab courses in the Biology, Chemistry, Physics disciplines at TU to satisfy COSC major requirement*.
2. Students should choose **CMNS 101 Fundamentals of Communication** as their Arts and Humanities (A) General Education Requirement at CCBC to satisfy Core 5 and a major requirement at TU. Students who do not take CMNS 101 at CCBC *will need to take COMM 131 at TU to satisfy the COSC program requirement*.

Program requirements/ electives:

1. Students should choose **ENGL 102 College Composition II** for a Program elective to satisfy a Core requirement at TU. Students who do not take **ENGL 102** *will need to take an additional Core course at TU*.

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CORE Curriculum requirements to be completed at TU: 3 Units

CORE 9	ENGL 317 Writing for Business and Industry	3
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Required Computer Science Courses 23 Units

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 4-8 Units

MATH 314	Introduction to Cryptography	4
**required for Computer Security track ONLY		
MATH 330	Introduction to Statistical Methods	4

Elective Math/Science Courses 7-8 Units

Select either two Math courses from the following, or one Math course and one Science course accepted in that major:

MATH 275	<i>Calculus III</i>	
MATH 314	<i>Introduction to Cryptography</i>	
MATH 369	<i>Introduction to Abstract Algebra</i>	
MATH 374	<i>Differential Equations</i>	
MATH 377	<i>Mathematical Models</i>	
MATH 378	<i>Scientific Modelling and Simulation</i>	
MATH 435	<i>Numerical Analysis I</i>	
MATH 437	<i>Operations Research</i>	
MATH 451	<i>Graph Theory</i>	

Elective Computer Science Courses 12 Units

Select at least two of the following:

COSC 417	<i>Introduction to the Theory of Computation</i>	
COSC 432	<i>Requirements Analysis & Modeling</i>	
COSC 436	<i>Object-Oriented Design and Programming</i>	
COSC 459	<i>Computer Simulation & Modeling</i>	
COSC 461	<i>Artificial Intelligence</i>	
COSC 471	<i>Computer Graphics</i>	
COSC 483	<i>Design & Analysis Algorithms</i>	

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Select at least two of the following (only one of COSC 397, COSC 490 and COSC 495 may be used in this category):

COSC 397	Internship/COSC
COSC 431	Selected Topics in Computer Science
COSC 440	Operating Systems Security
COSC 442	Software Quality Assurance And Testing
COST 450	Network Security
COSC 458	Application Software Security
COSC 465	Robotics
COSC 484	Web-Based Program
COSC 490	Software Project Practicum
COSC 495	Independent Study

Science Requirement

0-8 Units

Two lab science courses taken from physics, biology or chemistry, which must be accepted in that major. A list of approved courses can be found on the department's website.

****Students may need to complete this area at TU if course selections at CCBC were not made as indicated on page 2 of this agreement.**

Other Requirements

3-6 Units

COSC 418	Ethical and Societal Concerns of Computer Scientists	3
ENGL 317	Writing for Business and Industry (<i>counted above</i>)	(3)
COMM 131	Fundamentals of Speech Communication (<i>If CMNS 101 was not completed at HCC</i>)	(3)

Optional Tracks within the Computer Science Major:

****A student choosing one of these tracks would replace the "Elective Computer Sciences" section with the appropriate courses below.**

1. Computer Security Track Courses:

18 Units

COSC 310	Special Topics: Advanced 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

2. Software Engineering Track Required Courses:

12 Units

COSC 432	Requirements Analysis & Modeling	3
COSC 436	Object Oriented Design & Programming	3

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COSC 442	Software Quality Assurance and Testing	3
COSC 490	Software Project Practicum	3

Elective Software Engineering Courses: **6 Units**

Select two of the following:

COSC 310	Special Topics: Advanced Programming	3
COSC 458	Application Software Security	3
COSC 484	Web-Based Programming	3

Total Units to B.S. Degree	<u>120 Units*</u>
CCBC Computer Science A.S.	60
Completion of University Core at TU	3
Completion of Computer Science program requirements	49-65
Electives**	0-8

**This program is designed to be completed in 120 credits. Students who do not take courses at CCBC as outlined in this document may require additional credits depending on their course selections.*

Bachelor's Degree Requirements:

- *A C (2.0) or higher is required in all major courses.*
- *A cumulative grade point average (GPA) of 2.0 is required.*
- *32 units of the bachelor's degree must be completed at the upper level (courses numbered 300 or above).*