2+2 Articulation Agreement for Community College of Baltimore County and Towson University

Associate's Degree: A.S. in Computer Science
Bachelor's Degree: B.S. in Information Systems
(Data Analysis, Interface Design, or Systems Track)
Effective Term: Fall 2021

Section 1: Course Completion Plan for CCBC

This section outlines the courses to take for the Community College of Baltimore County (CCBC) general education and program requirements in order to complete both the CCBC and TU degrees within a total of 4 years and 120 credits. The following tables do not include any nontransferable or prerequisite coursework outside of the curriculum.

Table 1: General Education Courses Applied to TU Core Curriculum

CCBC Requirement	CCBC Course to Take	Credits	Towson University Equivalent Course
English Composition	ENGL 101 College Composition I	3	ENGL 102 Writing for a Liberal Education
Mathematics	MATH 251 Calculus I	4	MATH 273 Calculus I
Arts & Humanities	Any arts & humanities course.	3	Equivalency will vary by course.
Arts & Humanities	Any arts & humanities course.	3	Equivalency will vary by course.
Social & Behavioral Sciences	Any social & behavioral science course.	3	Equivalency will vary by course.
Social & Behavioral Sciences	Any social & behavioral science course.	3	Equivalency will vary by course.
Biological & Physical Sciences	Any biological & physical sciences course with a lab.	4	Equivalency will vary by course.
Biological & Physical Sciences	Any biological & physical sciences course with or without a lab.	3-4	Equivalency will vary by course.
Information Technology	CSIT 111 Logic & OO Design	3	COSC 175 General Computer Science
Program Requirement	MATH 243 Discrete Mathematics	4	MATH 263 Discrete Mathematics

Total general education applied to the TU Core Curriculum: 33-34 credits

Completing the courses above will satisfy the general education program at CCBC. TU will transfer these courses without a course-by-course match to the Core Curriculum requirements. See section 2 for details.

Table 2: Program Requirements and Electives Applied to TU Degree

CCBC Requirement	CCBC Course to Take	Credits	Towson University Equivalent Course
Program Requirement	CSIT 210 Introduction to Programming	4	COSC 236 Introduction to Computer Science I
Program Requirement	CSIT 211 Advanced Programming	4	COSC 237 Introduction to Computer Science II
Program Requirement	CSIT 214 C++ Programming	4	COSC TLL Computer Science Elective
Program Requirement	MATH 252 Calculus II	4	MATH 274 Calculus II
Program Requirement	MATH 257 Linear Algebra	4	MATH 265 Linear Algebra
Program Elective	MATH 153 Introduction to Statistical Methods	4	MATH 231 Basic Statistics
Program Elective	Any approved program elective course.	3-4	Equivalency will vary by course.

Total program requirements applied to the TU degree: 27-28 credits
Total transferred to TU: 60-62 credits

Students may transfer a maximum of 64 credits. If students do not adhere to the courses outlined above in Tables 1 and 2, they are not guaranteed completion of the bachelor's degree in 2 years. Refer to section 2 for specific course details and transfer planning information.

Section 2: CCBC Course Selection & Transfer Details

This section explains any specific course selections made in section 1 and provides transfer planning guidance specific to this degree plan. Students must follow the course selections outlined in this document. If students do not complete any or all of the courses outlined in this agreement, they will be required to complete outstanding requirements at TU.

GENERAL EDUCATION

Students must note the following general education requirements and information:

- When a course selection is not specified for a general education requirement, students may choose any approved course for that requirement at CCBC. Course selections for general education requirements are specified in this agreement only if they are specified in the CCBC catalog or if they will satisfy a TU major requirement.
- **Arts & Humanities** or **Social/Behavioral Sciences**: Take an approved **diversity course** in at least one of these general education areas to satisfy CCBC degree requirements.
- **Biological & Physical Sciences**: At least one of these courses must include a lab component.
- **Total General Education Credits**: Though the CCBC degree requires only 30 credits of general education, TU will recognize the program requirement MATH 263 as an additional general education course in order to satisfy the TU Core Curriculum with a core package.

The following information explains the transfer of students' general education courses:

- TU will recognize the courses in Table 1 (see section 1) as a completed general education program. Students will receive a core package that satisfies most of the TU Core Curriculum without the need for course-by-course placement in specific Core Curriculum requirements.
- Students will only need to complete two Core Curriculum requirements at TU: Advanced Writing Seminar (Core 9) and Ethical Perspectives (Core 14). Students will only need to complete two Core Curriculum requirements at TU: Advanced Writing Seminar (Core 9) and Ethical Perspectives (Core 14). Both of these requirements will be satisfied by upper-level courses required by the Information Systems major at TU (see section 3). Students who take an ethics course at CCBC will be required to complete a different Core Curriculum requirement than Core 14 and will still be required to complete the COSC 418 course required for the major at TU.

PROGRAM REQUIREMENTS

Students must note the following information regarding their program requirements at CCBC:

- Both **CSIT 210 Introduction to Programming** and **CSIT 211 Advanced Programming** must be completed with a C or higher in order to transfer as COSC 236 and COSC 237. If students do not complete both courses with a C or higher, they will transfer as elective credit.
- **CSIT 214 C++ Programming** is typically equivalent to COSC 175 at TU. However, since CSIT 111 also transfers as COSC 175, TU will transfer CSIT 214 as a lower-level computer science elective (COSC TLL) for this agreement.

PROGRAM ELECTIVES

Students must take the following courses in order to also satisfy required courses in the major at TU:

- **MATH 153 Introduction to Statistical Methods**, which will satisfy the required math course of MATH 231 in the Information Systems major.
- The second program elective may be satisfied any approved program elective. Students should refer to the current CCBC catalog for their elective course options.

DEGREE COMPLETION INFORMATION

Students must note the following information about completing their A.S. degree at CCBC:

- CCBC requires any student who is new to college to take ACDV 101 Academic Development: Transitioning to College. 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. This 1-credit course is designed to be taken in the first semester at CCBC. ACDV 101 transfers to TU as a general elective.
- The CCBC computer science program is designed for students who are calculus-ready at the start of their enrollment. MATH 251 Calculus I requires a prerequisite for enrollment which may include completion of additional CCBC courses, passing a placement exam, or department approval. Students who need to complete MATH 165 Pre-calculus II prior to enrolling in MATH 251 may count this course as their second program elective.

Section 3: Degree Requirements to Be Completed at TU

This section outlines the degree requirements for students transferring into the Information Systems major with the Systems, Interface Design, or Data Analytics track. This major is designed for students who enjoy working with both technology and people; the major will prepare students for work in the information systems field by developing a unique combination of technical, organizational, and behavioral skills. Refer to section 4 for track descriptions and university-wide degree requirements. A separate degree completion plan is available for students pursuing the IS major Business track.

CORE CURRICULUM REQUIREMENTS: 6 UNITS

Core 9 Advanced Writing Seminar – Satisfied by ENGL 317 in the major.
Core 14 Ethical Perspectives – Satisfied by COSC 418 in the major.

INFORMATION SYSTEMS MAJOR REQUIRED COURSES: 27 UNITS

CIS 211 Fundamentals of Information Systems & Technology (3 units)
CIS 239 Enterprise Systems and Architecture (3 units)
CIS 350 Telecommunications (3 units)
CIS 377 Introduction to Cybersecurity (3 units)
CIS 379 Systems Analysis and Design (3 units)
CIS 435 Human-Computer Interaction (3 units)
CIS 458 Organizational Database Management (3 units)
CIS 479 Software Project Management (3 units)
COSC 418 Ethical and Societal Concerns of Computer Scientists (3 units – counted in Core Curriculum requirements)
ENGL 317 Writing for Business and Industry (3 units – counted in Core Curriculum requirements)
ITEC 231 Fundamentals of Web Technologies (3 units)

INFORMATION SYSTEMS MAJOR CAPSTONE: 3 UNITS

CIS 475 Information Systems Capstone (3 units)

INFORMATION SYSTEMS MAJOR CAREER TRACK: 21-22 UNITS

Students will select one of three major tracks based on their career goals; see section 4 for track descriptions. The three track options are data analytics, interface design, or systems. Required courses will vary by track and are listed below:

Data Analytics Track – 21 Units

CIS 328 Introduction to Data Analytics (3 units)
CIS 334 Data Organization (3 units)
CIS 428 Text Analytics (3 units)
CIS 468 Applied Data Mining and Visual Analytics
ITEC 336 Legal and Policy Issues in Information Technology

Select two of the following courses for 6 units:

- CIS 265 Visual Basic Programming
- CIS 397 Internship in CIS
- CIS 433 Select Topics in Information Systems
- CIS 495 Independent Study in Computer Information Systems
- ITEC 427 Cloud Computing for Enterprises

Interface Design Track – 21 Units

Select one of the following for 3 units:

- ART 102 2D Process for Non-Art Majors
- ART 103 2D Process

ART 217 Imagemaking: Digital Process (3 units)
CIS 334 Data Organization (3 units)
CIS 445 Universal Usability: Designing Computer Interfaces for Blind Users (3 units)
CIS 468 Applied Data Mining and Visual Analytics
Select two of the following courses for 6 units:

- ART 365 Design for the WWW
- CIS 328 Introduction to Data Analytics
- CIS 397 Internship in CIS
- CIS 425 Decision Support Systems
- CIS 426 Gaming Interface Design
- CIS 428 Text Analytics
- CIS 433 Select Topics in Information Systems
- CIS 495 Independent Study in Computer Information Systems
- DFST 101 Introduction to Deaf Studies or OCTH 211 Philosophy of Occupational Therapy
- ITEC 433 Cyber Security Risk Management

Systems Track – 22 Units

CIS 440 System Development/E-Commerce (3 units)
COSC 336 Data Structures and Algorithm Analysis (4 units)
COSC 412 Software Engineering (3 units)
COSC 436 Object-Oriented Design (3 units)
COSC 484 Web-Based Program (3 units)
Select two of the following courses for 6 units:

- CIS 212 Intro to Business Programming or CIS 265 Visual Basic Programming
- CIS 328 Introduction to Data Analytics
- CIS 397 Internship in CIS

- CIS 425 Decision Support Systems
- CIS 426 Gaming Interface Design
- CIS 428 Text Analytics
- CIS 433 Select Topics in Information Systems
- CIS 468 Applied Data Mining and Visual Analytics
- CIS 495 Independent Study in Computer Information Systems
- ITEC 345 Scripting Languages
- ITEC 423 Emerging Internet Technologies
- ITEC 427 Cloud Computing for Enterprises
- ITEC 433 Cyber Security Risk Management

GENERAL ELECTIVES: 0-3 UNITS

The total number of required elective units will be determined by the total units transferred and completed within the major. Electives units can be satisfied by taking additional major electives or courses for personal interests.

Section 4: Additional Requirements & Recommendations for TU Degree Completion

CAREER TRACK DESCRIPTIONS FOR INFORMATION SYSTEMS MAJOR:

- Data Analytics – This track prepares students in fundamental concepts, techniques and tools of data analytics, focusing on real life experience in analyzing data from various domains, solving problems and making decisions based on data.
- Interface Design – This track prepares students in incorporating design and cognition into technology development with a focus on building screen interface layouts and physical devices that are appropriate for specific users, tasks and environments.
- Systems – This track prepares students in conceptualizing and developing robust and reliable information systems with a focus on key technical skills in information system analysis, design and development.

BACHELOR'S DEGREE REQUIREMENTS FOR ALL STUDENTS:

- A C (2.0) or higher is required in all major courses and prerequisites.
- 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).

Degree Completion Summary

Total Units Required for B.S. Degree	**120 UNITS**
CCBC A.S. Degree in Computer Science	**60-62**
Completion of Core Curriculum at TU	**6**
Information Systems Major Coursework at TU	**51-52**
General Electives Taken at TU	**0-3**

Update of Agreement

This agreement was originally published under a Memoranda of Understanding (MOU) between CCBC and TU. The MOU signed October 15, 2018 made this agreement effective for five years. This updated agreement reflects changes in TU's transfer policy as well as changes to the IS major made in Fall 2020 and Fall 2021. The changes effective Fall 2020 include the acceptance of ACDV 101 in transfer and the removal of the e-government track in the IS major. Effective Fall 2021, the data analytics track was added to the major at TU. This revised agreement has been approved by both CCBC and TU.