

MEMORANDUM OF UNDERSTANDING
HARFORD COMMUNITY COLLEGE & TOWSON UNIVERSITY
September 25, 2017

MATHEMATICS, Applied Mathematics Concentration B.S. Degree

Harford Community College, Bel Air, 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 Mathematics (Applied Mathematics Concentration) (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 Harford Community College 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 Mathematics program at Harford Community College may transfer into Towson University's Mathematics 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 Harford Community College 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 Harford Community College'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. Harford Community College 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 Harford Community College and Towson University agree to work together to facilitate the transfer of students from Harford Community College 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 ten years, beginning *fall 2017*, 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 Harford Community College 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.

HARFORD COMMUNITY COLLEGE AND TOWSON UNIVERSITY



Dr. Steven Thomas
Vice President for
Academic Affairs

Date 9.29.2017



Dr. Timothy Chandler
Provost and Vice-President for
Academic Affairs

Date 10/13/17

HARFORD COMMUNITY COLLEGE MATHEMATICS A.S. DEGREE
TOWSON UNIVERSITY MATHEMATICS APPLIED MATHEMATICS CONCENTRATION B.S. DEGREE

HARFORD COMMUNITY COLLEGE			TOWSON UNIVERSITY			
COURSE #	COURSE TITLE	CRS.	TU EQUIVALENCY	CORE	COMMENTS	COURSE ID#
ENG 101	English Composition (GE)	3	TSEM 102 waived	1.	Towson Seminar	
MATH 203	Calculus I (GM)	4	ENGL 102	2.	English Composition	2348
CIS 102***	Introduction to Information Sciences (GI)	3	MATH 273	3.	Mathematics	4407
(GH)*	Arts/Humanities Elective (GH)	3	COSC 111	4.	Creativity & Creative Development	13369
(GB)*	Behavioral/Social Science Elective (GB)	3	Depends on choice.	5.	Arts & Humanities	
PHYS 204	Gen Phys: Vibrations., Waves, Heat, Electricity and Magnetism (GL)	4	Depends on choice.	6.	Social & Behavioral Sciences	
PHYS 203/200**	Gen Phys: Mechanics and Particle Dynamics w/Lab (GL/GS)	3-4	PHYS 242	7.	Biological & Physical Science w/Lab	6806
			PHYS 241**	8.	Biological & Physical Science	6805
GEN ELECT***	General Education Elective	3	Depends on choice.	9.	Advanced Writing Seminar	
GEN ELECT***	General Education Elective	3	Depends on choice.	10.	Metropolitan Perspectives	
(GB)*	Behavioral/Social Science Elective (GB)	3	Depends on choice.	11.	The United States as a Nation	
(GH)*	Arts/Humanities Elective (GH)	3	Depends on choice.	12.	Global Perspectives	
PHIL 205 ***	Ethics	3	PHIL 253	13.	Diversity & Difference	
				14.	Ethical Issues & Perspectives	6548****
Total CORE in Transfer		38-39				
MATH 204	Calculus II	4	MATH 274			4408
MATH 206	Calculus III	4	MATH 275			4409
MATH 217	Linear Algebra	4	MATH 265			4403
MATH 208	Elementary Differential Equations	3	MATH T74 (374)		Content Equivalent – transfers as lower level credit.	10493
CSI 131	Computer Science I	4	COSC 236		Equivalency exception for this program.	1344
PE	Physical Education Elective	1	PHEA TLL			10564
GEN ELECT***	General Elective	1-2	Depends on choice.			
Program Requirements at Harford		21-22				
Total Harford Program Requirements at Harford		60				
Maximum Credits in Transfer		64				

64 credit transfer maximum. 3 Core Curriculum units must be completed at Towson University: Core 9: Advanced Writing Seminar

*One GB or GH course must also satisfy the Diversity requirement at HCC.

** Students must take both PHYS 200 and PHYS 203 to receive PHYS 241 equivalent. Students who take PHYS 203 without the lab (PHYS 200) will receive an equivalent of PHYS 10T. PHYS 10T equivalent will satisfy Core 8 but it will not satisfy an Application Elective (major) requirement at TU. Students who do not complete PHYS 200 will need to take an Application Elective at TU.

***Students should choose CIS 102, PHIL 205 and two additional General Education courses as their general electives to satisfy program requirements at HCC and Core requirements at TU. Students who do not take General Education courses as outlined here may have to take additional Core courses at TU.

****Requires course directive for Core placement.

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CORE REQUIREMENTS TO BE COMPLETED AT TOWSON 3-15 UNITS

CORE 9: ADVANCED WRITING SEMINAR (3 UNITS)

CORE 4: CREATIVITY AND CREATIVE DEVELOPMENT (3 UNITS)

(If CIS 102 was not taken at HCC)

CORE 10: METROPOLITAN STUDIES (3 UNITS)

(If additional General Education course was not taken at HCC)

CORE 11: THE UNITED STATES AS A NATION (3 UNITS)

(If additional General Education course was not taken at HCC)

CORE 14: ETHICAL ISSUES AND PERSPECTIVES (3 UNITS)

(If PHIL 205 was not taken at HCC)

PROGRAM REQUIREMENTS TO BE COMPLETED AT TOWSON 44-50 UNITS

REQUIRED COURSES:

MATH 267 INTRODUCTION TO ABSTRACT MATHEMATICS **7-8 UNITS**
(4 UNITS)

SELECT ONE OF THE FOLLOWING:

MATH 369 INTRODUCTION TO ABSTRACT ALGEBRA (3-4 UNITS)

MATH 463 LINEAR ALGEBRA

MATH 473 INTRODUCTORY REAL ANALYSIS

COURSES FOR APPLIED MATHEMATICS CONCENTRATION: 37-42 UNITS

REQUIRED COURSES:

MATH 267 INTRODUCTION TO ABSTRACT MATHEMATICS (31 UNITS)

MATH 331 PROBABILITY

MATH 332 MATHEMATICAL STATISTICS

MATH 369 INTRODUCTION TO ABSTRACT ALGEBRA

MATH 374 DIFFERENTIAL EQUATIONS

MATH 377 OR MATHEMATICAL MODELS **OR**

MATH 439 COMPUTATIONAL PROBABILITY MODELS (CAN CHOOSE EITHER MATH 377 OR 439, BUT NOT BOTH)

MATH 435 NUMERICAL ANALYSIS I

MATH 473 INTRODUCTORY REAL ANALYSIS

MATH 475 COMPLEX ANALYSIS

MATH 490 SENIOR SEMINAR IN MATHEMATICS

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UPPER-DIVISION MATHEMATICS ELECTIVES:

Select two of the following:

- MATH 337 APPLIED REGRESSION AND TIME SERIES ANALYSIS
- MATH 379 FOURIER ANALYSIS WITH APPLICATIONS
- MATH 437 OPERATIONS RESEARCH
- MATH 439 COMPUTATIONAL PROBABILITY MODELS
- MATH 451 GRAPH THEORY
- MATH 457 DIFFERENTIAL GEOMETRY
- MATH 463 LINEAR ALGEBRA

(6-7 UNITS)

APPLICATION ELECTIVES: Completed at HCC.

Students who did not take PHYS 200 with PHYS 203 will be required to take one of the following:

- BIOL 309 GENETICS
- COSC 336 DATA STRUCTURES AND ALGORITHM ANALYSIS
- COSC 417 INT THEORY COMP
- COSC 461 ARTIFICIAL INTELLIGENCE
- COSC 471 COMPUTER GRAPHICS
- MATH 438 ACTUARIAL MODELS
- MATH 485 MATHEMATICAL FINANCE
- MATH 486 RISK MANAGEMENT AND FINANCIAL ENGINEERING
- PHYS 307 INTRODUCTORY MATHEMATICAL PHYSICS
- POSC 459 SIMULATION AND GAMES IN POLITICAL SCIENCE
- PSYC 314 RESEARCH METHODS IN PSYCHOLOGY

(0-4 UNITS)

TOTAL CREDITS TO B.S. DEGREE (120-125)

Harford Mathematics A.S. Degree	60
Completion of Core Curriculum at TU	3-15
Major Requirements at TU	44-50
Electives at TU	0 -13