

MEMORANDUM OF UNDERSTANDING
HARFORD COMMUNITY COLLEGE & TOWSON UNIVERSITY
March 26, 2018

Physics (Computational Physics 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 Physics (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 Physics program at Harford Community College may transfer into Towson University's Physics: Computational Physics concentration 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 *spring 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 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 5.30.2018



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

Date 5/11/18

HARFORD COMMUNITY COLLEGE/PHYSICS A.S. DEGREE
TOWSON UNIVERSITY/PHYSICS: Computational Physics Concentration B.S. DEGREE

HARFORD COMMUNITY COLLEGE			TOWSON UNIVERSITY			
COURSE #	COURSE TITLE	CRS	TU EQUIVALENCY	CORE	COMMENTS	COURSE ID#
ENG 101	English Composition (GE) (grade of C or better)	3	TSEM 102 Waived ENGL 102	1.	Towson Seminar English Composition	2348
MATH 203	Calculus I (GM)	4	MATH 273	2.	Mathematics	4407
CIS 102 *	Introduction to Information Science (GI)	3	COSC 111	3.	Creativity & Creative Development	13369
GH	Arts & Humanities (GH)	3	Depends on choice.	4.	Arts & Humanities	
GB	Behavioral & Social Science (GB)	3	Depends on choice.	5.	Social & Behavioral Sciences	
CHEM 111	General Chemistry I (GL)	4	CHEM 131/131L	6.	Biological & Physical Science w/Lab	13097/13098
CHEM 112	General Chemistry II A (GL)	4	CHEM 132/132L	7.	Biological & Physical Science	13099/13100
				8.		
				9.	Advanced Writing Seminar	
GH**	Arts & Humanities (GH)	3	Depends on choice.	10.	Metropolitan Perspectives	
GB**	Behavioral & Social Science (GB)	3	Depends on choice.	11.	The United States as a Nation	
ELECTIVE***	General Elective	3	Depends on choice.	12.	Global Perspectives	
				13.	Diversity & Difference	
				14.	Ethical Issues & Perspectives	
Total CORE in Transfer		33				
MATH 204	Calculus II (GM)	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 774 (374)		Transfers as lower-level credit.	10493
PHYS 200/203****	Gen Phys: Mechanics & Particle Dynamics w/lab (GL/GS)	4	PHYS 241			6805
PHYS 204	Gen Phys: Vibrations, Waves, Heat, Electricity & Magnetism (GI)	4	PHYS 242			6806
PHYS 205	Gen Phys: Electrodynamics, Light Relativity & Modern Physics	4	PHYS 243			6807
	Physical Education Elective	1	PHEA TLL			10564
	Program Requirements at Harford	28				
	Total Program Requirements at Harford	61				
	Maximum Credits in Transfer	64				

64 credit transfer maximum. 9 Core Curriculum units must be completed at Towson University: 9. Advanced Writing Seminar; 10. Metropolitan Perspectives and 14. Ethical Issues and Perspectives.

*Students should choose CIS 102 as their CIS Elective to satisfy a Core requirement at TU. Students who do not choose CIS 102 will be required to take a Core 4 course at TU.
 ** One GB or GH course must also satisfy Diversity requirement at HCC.

***Students should choose a General Education course as their General Elective to satisfy Core requirements. Students who do not choose a General Education course may need to take an additional Core class at TU.

****Students must take PHYS 200 with PHYS 203 to receive equivalency of PHYS 241 and to satisfy the major requirement at TU.

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CORE REQUIREMENTS TO BE COMPLETED AT TOWSON 9-12 UNITS

CORE 9:	Advanced Writing Seminar	(3 UNITS)
CORE 10:	Metropolitan Studies	(3 UNITS)
CORE 14:	Ethical Issues and Perspectives	(3 UNITS)

Students who did not take CIS 102 as CIS elective may need to complete a Core 4 course. (3 UNITS)

PROGRAM REQUIREMENTS TO BE COMPLETED AT TOWSON 50 UNITS

REQUIRED PHYSICS COURSES: 22 UNITS

PHYS 185	INTRODUCTORY HONORS SEMINAR IN PHYSICS	(1 UNIT)
PHYS 270	COMPUTERS IN PHYSICS	(4 UNITS)
PHYS 307	INTRODUCTORY MATHEMATICAL PHYSICS	(3 UNITS)
PHYS 311	MODERN PHYSICS I	(3 UNITS)
PHYS 341	INTERMEDIATE PHYSICS LABORATORY	(3 UNITS)
PHYS 351	MECHANICS	(4 UNITS)
PHYS 354	ELECTRICITY & MAGNETISM	(4 UNITS)

COURSES FOR COMPUTATIONAL PHYSICS CONCENTRATION: 28 UNITS

• ADVANCED PHYSICS COURSES		
PHYS 337	DIGITAL ELECTRONICS	(4 UNITS)
PHYS 385	PHYSICS SEMINAR	(1 UNIT)
PHYS 486	PHYSICS SEMINAR II	(1 UNIT)
• NON-PHYSICS REQUIREMENTS		
COSC 236	INTRODUCTION TO COMPUTER SCIENCE I	(4 UNITS)
COSC 237	INTRODUCTION TO COMPUTER SCIENCE II	(4 UNITS)
COSC 290	PRINCIPLES OF COMPUTER ORGANIZATION	(4 UNITS)
COSC 336	DATA STRUCTURES AND ALGORITHM ANALYSIS	(4 UNITS)
MATH 263	DISCRETE MATHEMATICS	(3 UNITS)
MATH 435	NUMERICAL ANALYSIS I	(3 UNITS)

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Additional Bachelor Degree Requirements

- A C (2.0) or higher is required in all major and minor 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)

<u>Total Credits to B.S. Degree</u>	(120-123)
Harford Biology A.S. Degree	61
Completion of Core at TU	9-12
Completion of Major Requirements at TU	50
Elective Credits at TU	0