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

Physics (Astrophysics 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: Astrophysics 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

Effective Spring 2018

Attachment A

03/25/2018

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

HARFORD COMMUNITY COLLEGE			TOWSON UNIVERSITY			
COURSE #	**COURSE TITLE**	**CRS**	**TU EQUIVALENCY**	**CORE**	**COMMENTS**	**COURSE ID#**
			TSEM 102 Waived	**1.**	**Towson Seminar**	
ENG 101	English Composition (GE) (grade of C or better)	3	ENGL 102	**2.**	**English Composition**	**2348**
MATH 203	Calculus I (GM)	4	MATH 273	**3.**	**Mathematics**	**4407**
CIS 102 *	Introduction to Information Science (GI)	3	COSC 111	**4.**	**Creativity & Creative Development**	**13369**
GH	Arts & Humanities (GH)	3	Depends on choice.	**5.**	**Arts & Humanities**	
GB	Behavioral & Social Science (GB)	3	Depends on choice.	**6.**	**Social & Behavioral Sciences**	
CHEM 111	General Chemistry I (GL)	4	CHEM 131/131L	**7.**	**Biological & Physical Science w/Lab**	**13097/13098**
CHEM 112	General Chemistry II A (GL)	4	CHEM 132/132L	**8.**	**Biological & Physical Science**	**13099/13100**
				9.	**Advanced Writing Seminar**	
				10.	**Metropolitan Perspectives**	
GH**	Arts & Humanities (GH)	3	Depends on choice.	**11.**	**The United States as a Nation**	
GB**	Behavioral & Social Science (GB)	3	Depends on choice.	**12.**	**Global Perspectives**	
ASTR 151/152***	Intro to Astronomy (GS) w/Sky and Telescope Lab (GL)	4	ASTR 161	**13.**	**Diversity & Difference**	**624**
				14.	**Ethical Issues & Perspectives**	
Total CORE in Transfer		**34**				
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 T74 (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 (GL)	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		**62**				
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 interested in the Astrophysics concentration should take ASTR 151 (Introduction to Astronomy) and ASTR 152 (Sky and Telescope Laboratory) as their General Elective to satisfy a Core requirement and a major requirement at TU. Note that students must have both ASTR 151 and ASTR 152 to receive credit for ASTR 161 and to satisfy the required course for the Astrophysics concentration at TU. Students who do not take ASTR 151/152 will need to take ASTR 161 at TU and may be required to take an additional CORE requirement at TU.

****Students must take PHYS 200 with PHYS 203 to receive equivalency of PHYS 241 and to satisfy a 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 require Core 4 ***(3 UNITS)***

PROGRAM REQUIREMENTS TO BE COMPLETED AT TOWSON — 46-50 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 ASTROPHYSICS CONCENTRATION: — 24-28 UNITS

- **ADDITIONAL PHYSICS/ASTROPHYSICS COURSES**

ASTR 161	GENERAL ASTRONOMY I	(4 UNITS)

(If ASTR 151 and ASTR 152 were not taken as general electives at HC. Must have both ASTR 151 and 152)

ASTR 162	GENERAL ASTRONOMY II	**(4 UNITS)**
ASTR 303	ASTROPHYSICAL TECHNIQUES	**(3 UNITS)**
ASTR 331	INTRODUCTION TO STELLAR ASTROPHYSICS	**(3 UNITS)**
ASTR 385	ASTROPHYSICS SEMINAR	**(1 UNIT)**
ASTR 432	GALAXIES AND COSMOLOGY	**(3 UNITS)**
PHYS 312	MODERN PHYSICS II	**(3 UNITS)**
PHYS 486	PHYSICS SEMINAR II	**(1 UNIT)**

- **ELECTIVES**

AT LEAST SIX UNITS OF UPPER LEVEL PHYSICS OR ASTRONOMY ELECTIVES **(6 UNITS)**

- **NON-PHYSICS REQUIREMENTS** (COMPLETED AT HCC) **(0 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)

Total Credits to B.S. Degree	(120-124)
Harford Biology A.S. Degree	62
Completion of Core at TU	9-12
Completion of Major Requirements at TU	46-50
Elective Credits at TU	0-3