AMENDED
ARTICULATION AGREEMENT

Harford Community College
Associate of Sciences – Engineering

Frostburg State University
Bachelor of Science in Engineering

Entered into this 23rd day of October, 2017.

Joseph M. Hoffman, Ph.D.
Dean
College of Liberal Arts and Sciences
Frostburg State University

Pamela Pape-Lindstrom
Dean, Science, Technology, Engineering
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Eric J. Moore, Ph.D.
Chair Department of Physics and Engineering
Frostburg State University

This agreement will be reviewed annually.

ARTICULATION AGREEMENT

Harford Community College, Associate of Sciences– Engineering and
Frostburg State University, Bachelor of Science in Engineering.

RECITALS

Harford Community College College (hereafter referred to as "Harford"), a community college in Harford County, Maryland, and Frostburg State University ("FSU"), a comprehensive regional institution in Western Maryland and a constituent institution of the University System of Maryland, agree to offer an articulated program leading to the award of an Associate of Sciences (A.S.) Degree and a Bachelor of Science (B.S.) in Engineering. The parties further agree that students from Harford, through this articulation agreement, will be permitted to transfer credits earned for the A.S. at Harford Community College to FSU, leading to the award of the B.S. degree in Engineering at FSU. The only concentration available pursuant to this agreement is materials engineering.

I. Purpose

a. It is the intent that this articulation agreement will facilitate a smooth transition from completion of Harford Community College's Associate of Sciences (Engineering) to the B.S. in Engineering program at FSU. As a result of this articulation agreement, Harford graduates will understand how FSU transfers the credits earned at Harford. This agreement provides a systematic plan for students to receive both the A.S. degree from Harford and the B.S. degree in Engineering from FSU.

b. This agreement sets forth a clear set of responsibilities and expectations for both institutions. The parties agree to work collaboratively to meet the needs of Harford graduates in facilitating transfer to FSU.

c. Harford encourages graduates to continue their educational pathway in engineering for both personal and professional development, as well as career advancement in the engineering profession. This articulation agreement for completion of the B.S. in Engineering facilitates students' successful achievement of credentials in the field.

II. Requirements of the Program

a. The program is designed for graduates of the A.S. in Engineering at Harford Community College. Students must complete the A.S. degree at Harford in order to participate in the transfer program. A maximum of seventy (70) credit hours from Harford will be allowed toward fulfillment of the one hundred twenty (120) credit hours required for completion of the B.S. degree. Students are limited to a maximum of ninety (90) credits when transferring courses from other four-year colleges and universities.

b. Engineering students from Harford will have their coursework evaluated by FSU to determine which FSU general education requirements and discipline requirements have been met. Harford courses shall be evaluated by FSU for transferability, and FSU shall accept courses for transfer at its sole discretion. By taking full advantage of the Harford-FSU course agreements described below, the transfer student will matriculate at FSU with junior standing.

c. In accordance with Code of Maryland Regulations (COMAR), all courses meeting general education requirements at Harford will transfer to FSU as general education courses (up to a maximum of 36 credits).

d. Students must maintain a minimum of a 2.0 cumulative grade point average in order to transfer to the FSU Engineering Program.

e. The maximum number of credits that will be accepted by FSU toward degree requirements from non-direct classroom instruction (including CLEP, AP, IB and FSU Special Departmental examination scores) is thirty (30) credits. Tech Prep credits will transfer where appropriate, as will credit awarded for experiential learning ("life experience") if recorded on Harford's transcript.

f. While Harford Community College and FSU do not presently have a dual admission program, if the parties later enter into such a program, this agreement will not preclude students from participation and students may apply for and receive the benefits of dual admission. Those students shall then be subject to the policies of said program should they apply.

g. Harford students who have completed the A.S. in Engineering degree will be given every consideration for financial assistance and will be eligible to compete for academic scholarships at FSU.

h. This agreement becomes effective on the date set forth on the first page of this document. Harford and FSU agree to publicize this program. The parties further agree to monitor the performance of the program and to make revisions as may be mutually agreed upon as necessary. Curricula for engineering programs undergo frequent change and this agreement will be amended to reflect such changes as they occur. Amendments will be made in writing and appended to this agreement. Amendments need only be approved by the deans and chairs from both institutions.

i. This agreement may be terminated by either party with ninety (90) days written notice to the other. The parties agree that termination shall include an agreement that students currently enrolled in the program at the time of termination shall be permitted to complete the program as described herein.

III. A.S. in Engineering -B.S. in Engineering Transfer Courses

The following indicates the transfer of course agreement between Harford Community College and FSU:

a. General Education Requirements to be Completed at Harford Community College (31-37 credits)

	Harford Community College Equivalent	Explanation/Notes
ENGLISH COMPOSITION (3 credits)	ENG 101	
FINE AND PERFORMING ARTS (3 credits) HUMANITIES (6 credits)	Three courses from the Arts/Humanities category (one from ART, DRAM, MUS, or THEA; two others from remaining categories).	6 credits of Arts & Humanities general education electives required for program completion at HCC. 3 additional credits are required by FSU's General Education Program (GEP). This requirement may be satisfied at HCC in addition to HCC's general education requirements or satisfied at FSU.
SOCIAL SCIENCE (6 credits)	Two approved general education courses (in two different disciplines) from the Behavioral/ Social Sciences category.	
MATHEMATICS (4 credits)	MATH 203	Required in the Engineering degree program
NATURAL SCIENCE (8 cr; one course must have a lab component)	PHYS 204 CHEM 111 or CHEM 135	Required in the Engineering degree program
MODES OF INQUIRY ELECTIVE (4 cr)	PHYS 205	Required in the Engineering degree program.
IDENTITY and DIFFERENCE (3 cr)		This requirement may be satisfied at HCC in addition to HCC's general education requirements or satisfied at FSU. Diversity course from Harford will satisfy this requirement

b. FSU's Technology Fluency Graduation Requirement

Completion of ENGR 103 will satisfy FSU's technology fluency requirement.

c. Degree Program Requirements to be Completed at Harford Community College (36 credits)

The B.S. degree with a major in Engineering at FSU requires students to successfully complete the following course work. Some of these courses also may meet general education requirements, as indicated above.

Frostburg State University			Harford Program Equivalent
Course Number	Course Title	Credit Hours	
ENES 100	Introduction to Engineering Design	3.0	ENGR 103
	General Elective *	1.0	ENGR 103

MATH 236	Calculus I	x	MATH 203 already in GEP above
MATH 237	Calculus II	4.0	MATH 204
MATH 238	Calculus III	4.0	MATH 206
MATH 432	Differential Equations	3.0	MATH 208
CHEM 201	General Chemistry I	x	CHEM 111 or CHEM 135
PHYS 261	Principles of Physics I – Mechanics	4.0	PHYS 203 and PHYS 200
PHYS 200		1.0	
PHYS 262	Principles of Physics II – Electricity and Magnetism	x	PHYS 204** already in GEP above
	General Elective ***	1.0	Physical Education Elective
Track Electives (students should select the following)			
ENES 102	Statics	3.0	ENGR 104
ENES 220	Mechanics of Materials	3.0	ENGR 202
ENES 221	Dynamics	3.0	ENGR 201
ENME 232	Thermodynamics	3.0	ENGR 232
PHYS 263 AND PHYS 264	Principles of Physics III – Acoustics and Optics AND Principles of Physics IV – Thermodynamics and Modern Physics	x	PHYS 205** already in GEP above
TOTAL Program Credits=32			

*One credit of HCC's four credit course, ENGR 103, will transfer as one general elective credit.
**The combined learning outcomes of PHYS 204 and 205 are equivalent to FSU's PHYS 262-264 courses.
***HCC's physical education requirement will transfer as one general elective credit.

d. Degree Program Requirements to be Completed at FSU (51-credits)
All FSU bachelor's degree candidates must complete a minimum of 39 upper-division (300-400) credit hours.

Frostburg State University			Notes
Course Number	Course Title	Credit Hours	
ENME 350	Electronics and Instrumentation I	3.0	
ENME 351	Electronics and Instrumentation II	3.0	
ENGL 338	Technical Writing	3.0	
ENME 331	Fluid Mechanics	3.0	
ENME 332	Transfer Processes	3.0	
ENME 373	Advanced Computer-Aided Design	3.0	Substituted for ENME 272
ENME 382	Engineering Materials and Manufacturing	3.0	
ENES 491	Engineering Seminar	3.0	
ENME 405	Fundamentals of Materials Engineering	4.0	
ENME 410	Capstone Design Project for Materials Engineering	3.0	

PHYS 499	Special Projects: Programming Concepts for Engineers	4.0	Substituted for ENEE 114
ENME 425	Microfabrication	3.0	
ENES 401	Fundamentals of Energy Engineering	3.0	
IDIS 150	Freshman Colloquium	3.0	Fulfills 3 hrs. of GEP colloquia requirements.
	300-400 level Technical Electives (any ENEE, ENES, or ENME course, or CHEM 304)	6.0	
Total = 50*			

*Total credits could be more if GEP courses remain to be satisfied at FSU

e. Course Sequencing

Engineering students transferring to the B.S. in Engineering Program at FSU shall be notified by Harford Community College and FSU that the Engineering curriculum is built upon a series of established course sequences. For students to progress through the program, they must have the appropriate pre-requisites, co-requisites, and must maintain a minimum 2.0 GPA.

Students wishing to participate in the program should develop an education plan at Harford by contacting:

Lisa Ovelman
Science, Technology, Engineering, and Mathematics
Harford Community College
443-412-2227
lovelman@harford.edu

Harford Community College will direct students interested in participating in the B.S. in Engineering program to apply for admission to FSU, indicating Engineering as the intended major. Applications can be submitted online at: www.frostburg.edu.

Contact person at FSU for the program is:

Linda Steele
Program Coordinator, College of Liberal Arts and Sciences
Frostburg State University
301-687-4137
lsteele@frostburg.edu

Appendix I:

The following page indicates the ***course-to-course equivalency***, including general education requirements, as agreed upon within the articulation agreement between the engineering A.S. program of Harford Community College and the engineering B.S. with a focus in material engineering program of Frostburg State University.

HARFORD COMMUNITY COLLEGE to FROSTBURG STATE UNIVERSITY				
Transferrable Prerequisite Requirements				
HCC Course	**Credits**	**FSU Equivalent**	**Credits**	**Area Fulfillment**
Arts/Humanities Elective (GH)	3	Humanities	3	(B) Humanities
Arts/Humanities Elective (GH)*	3	Humanities OR Fine & Performing Arts	3	(B) Humanities **OR** (A) Fine & Performing Arts
Behavioral/Social Sciences Elective (GB)*	3	The Social Sciences	3	(D) The Social Sciences
Behavioral/Social Sciences Elective (GB)*	3	The Social Sciences	3	(D) The Social Sciences
CHEM 111: General Chemistry I (GL) OR CHEM 135: Chemistry for Engineers	4	CHEM 201: Gen. Chemistry I	4	(C) Natural Science/Program req.
ENG 101: English Composition (GE)	3	ENGL 101/111: Freshman Composition	3	Core Skills 1
ENGR 103: Intro. to Engineering Design	4	ENES 100: Introduction to Engineering Design	3	Program requirement
See note***		General elective ***	1	See note
MATH 203: Calculus I (GM)**	4	MATH 236: Calculus I**	4	Core skill 3
MATH 204: Calculus II (GM)**	4	MATH 237: Calculus II**	4	Program requirement
MATH 206:Calculus III**	4	MATH 238: Calculus III**	4	Program requirement
MATH 208: Elementary Differential Equations**	3	MATH 432: Differential Equations **	3	Program requirement
PHYS 203: General Physics: Mechanics and Practical Dynamics (GS)**	3	PHYS 261: Principles of Physics I: Mechanics **	4	Program requirement
PHYS 204: General Physics: Vibrations, Waves, Heat, Electricity and Magnetism (GS)**	4	PHYS 262: Principles of Physics II: Electricity & Magnetism **	4	(C) Natural Science/Program req.
Physical Education	1	- - - - - - - -	1	General elective
HCC TRACK ELECTIVES:				
ENGR 104: Statics	3	ENES 102: Statistics	3	Materials Eng. req.
ENGR 202: Mechanics of Materials	3	ENES 220: Mechanics of Materials	3	Materials Eng. req.
ENGR 201: Dynamics	3	ENES 221: Dynamics	3	Materials Eng. req.
PHYS 205: General Physics: Electrodynamics, Light Relativity & Modern Physics (GL) **	4	PHYS 263: Principles of Physics III: Acoustics and Optic ** AND PHYS 264: Principles of Physics IV: Thermodynamics & Modern Physics **	4	Program requirement
ENGR 232 Thermodynamics	3	ENME 232 Thermodynamics	3	
Total:	**62**	**Credits to Transfer:**	**62**	

Notes:

*See FSU General Education Program for approved courses & choose accordingly.

**Per FSU program requirements, all majors must earn a grade of C or better in this course.

***One credit of HCC's ENGR 103 will count as a general elective at FSU.

Revised 7/14/17

Appendix II: Additional & Upper Division Requirements

All HCC transfer students will be required to take a minimum of **48** credit hours of upper division coursework at Frostburg State University and **3-9** credit hours of additional degree requirements. Completion of the B.S. in engineering program at Frostburg State University requires students to successfully complete the following coursework:

Additional Requirements			
Course Number	**FSU Course Title**	**Credit Hours**	**Explanation**
Modes of Inquiry (GEP) Requirements: 6 credits			
A or B	Humanities OR Fine & Performing Arts	3	Depends on which GH courses were taken at HCC. Can be completed at HCC.
F	Identity & Difference (300-400 Level)	3	Can be completed at HCC
Core Skills Courses: 3 credits			
IDIS	First Year FSU Colloquium	3	
Upper Level Program Requirements			
Major Requirements: 42			
ENGL 338: Technical Writing		3	Core Skills 2: Advanced Writing
ENME 331: Fluid Mechanics		3	
ENME 332: Transfer Processes		3	
ENME 350: Electronics and Instrumentation I		3	
ENME 351: Electronics and Instrumentation II		3	
ENME 373: Introduction to Computer-Aided Design		3	
ENME 382: Engineering Materials and Manufacturing		3	
ENME 405: Fundamentals of Materials Engineering		4	
ENME 410: Capstone Design Project for Materials Engineering		3	
ENME 425: Microfabrication		3	
ENES 401: Fundamentals of Energy Engineering		3	
ENES 491: Seminar		3	
PHYS 499: Special Projects - Programming Concepts for Engineering		4	Substituted for ENEE 114
PHYS 499: Special Projects - Mechanics		1	To be completed to fulfill the lab portion missing from PHYS 203 taken at HCC.
Upper Level Electives: 6 credits			
300-400 level ENES, ENEE, or ENME, or CHEM 304 (2 total)		6	
Total credits to be taken :		51-57	Credits will vary depending on student completion of FSU GEPs.

Summary:

Total credit hours to transfer from HCC:	62 (or up to 70)
Total credit hours needed in Core Skills & Modes of Inquiry:	3-9
Total credits of upper-level course work:	48
Total credit hours for B.S degree:	120