University of Wisconsin La Crosse
Lacrosse, Wisconsin
Articulation Agreement for Transfer Plan to
Swenson College of Science and Engineering
University of Minnesota Duluth
January 30, 2017

This agreement is entered into the University of Wisconsin La Crosse [2005 Cowley Hall, 1725 State Street, La Crosse, WI 54601] (hereinafter the sending institution), and the University of Minnesota Duluth [1049 University Drive, Duluth, MN 55812] (hereinafter the receiving institution). This Agreement and any amendments and supplements, shall be interpreted pursuant to the laws of the State of Minnesota.

The sending institution has established a **Physics B.S.** (hereinafter sending program), and the receiving institution has established the following programs: a **Civil Engineering B.S.C.E.**, an **Electrical Engineering B.S.E.E.**, an **Industrial Engineering B.S.I.E.**, and a **Mechanical Engineering B.S.M.E.** (hereinafter receiving programs), and will facilitate credit transfer and provide a smooth transition from one related program to the other. It is mutually agreed:

Admission and Graduation Requirements

A. The receiving institution's admission and program admission requirements apply to both direct entry students and to students who transfer under this agreement.
B. Students must complete the entire sending program and meet the receiving institution's admission requirements for the agreement to apply, including grade requirements for courses and an overall GPA requirement.

Transfer of Credits

A. Credits will transfer as follows:
    i. For Civil Engineering, the receiving institution will accept 89 credits from the sending program. A total of 56 credits remain to complete the receiving program.
    ii. For Electrical Engineering, the receiving institution will accept 87 credits from the sending program. A total of 55 credits remain for the receiving program.
    iii. For Industrial Engineering, the receiving institution will accept 86 credits from the sending program. A total of 56 credits remain for the receiving program.
    iv. For Mechanical Engineering, the receiving institution will accept 89 credits from the sending program. A total of 50 credits remain for the receiving program.
B. Courses will transfer as described in the attached Program Articulation Tables.

Implementation and Review

A. The Chief Academic Officers or designees of the parties to this Agreement will implement the terms of this agreement, including identifying and incorporating any

changes into subsequent agreements, assuring compliance with system policy, procedure and guidelines, and conducting periodic review of this agreement.

B. This articulation agreement is effective on 07/01/2017 and will remain in affect until terminated or amended by either party with 90 days prior written notice.
C. The two universities shall work with students to resolve the transfer of courses should changes to either program occur while the Agreement is in effect.
D. This Articulation Agreement will be reviewed by both parties beginning 01/01/2022 (within six months of the fifth anniversary of the agreement).
E. When a student notifies the receiving institution of their intent to follow this agreement, the receiving institution will encode course waivers and substitutions.

Table 1. Articulation for UWL General Education/UMD Liberal Education

SECTION 1A – Minnesota Transfer Curriculum – Liberal Education						
University of Wisconsin La Crosse (sending)			**University of Minnesota Duluth (receiving)**			
Course prefix, number and name	UWL Gen. Ed.	Credits	Course prefix, number and name	Category	Credits applied	Equiv Sub Wav
General Education – University of Wisconsin La Crosse			Minnesota Transfer Curriculum – Liberal Education			
ENG 110 College Writing	IA	3	WRIT 1120 College Writing	1a	3	Equiv
CST 110 Communicating Effectively	IA	3	COMM 1112 Public Speaking	1b	3	Equiv
MTH 207 Calculus I	IB	5	MATH 1296 Calculus I	1c	5	Equiv
General Education Requirement IIA: Minority Cultures or Multiracial Women's Studies	IIA	3	Part 3. B. Cultural Diversity in the United States	3b	3	Equiv
ECO 120 Global Macroeconomics	IIB	3	ECON 1022 Principles of Economics: Macro	2b	3	Equiv
General Education Requirement IIB: International and Multicultural Studies	IIB	3	Part 3. A. Global Perspectives	3a	3	Equiv
PHY 203 General Physics 1 or PHY 103 Fundamental Physics 1	IIC	4	PHYS 2013 General Physics 1 and PHYS 2014 Gen Physics 1 Lab	2a	5	Equiv or sub
General Education Requirement IID: Self and Society	IID	3	Part 3. B. Sustainability		3	Sub
General Education Requirement IIE: Humanistic Studies	IIE	3	Part 2. C. Humanities	2c	3	Equiv
General Education Requirement IIF: Arts	IIF	4	Part 2. D. Fine Arts	2d	4	Equiv
General Education Requirement IIG: Health and Physical Well-Being	IIG	3	HLTH 1470 Human Nutrition	2a	3	Equiv
General Education University of Wisconsin La Crosse - Total		**37**				

Special Notes:
Students will complete the general education requirement for the University of Wisconsin La Crosse.
Liberal Education requirements at the University of Minnesota Duluth will be considered complete at the time of transfer.
Students will have to take a second General Education Category IIB course (other than ECO 120) at UW La Crosse since ECO 120 transfers to UMD in the Social Science Liberal Education category

Table 2. Articulation for B.S.C.E. in Civil Engineering

SECTION 2A – Civil Engineering Major

(pre-requisite courses, required core courses, or electives (restricted or general) within the major)

MTH 208 Calculus II	4	MATH 1297 Calculus II	5	Equiv
MTH 245 Probability and Statistics	4	STAT 3411 Engineering Statistics	3	Equiv
MTH 309 Linear Algebra with Differential Equations	4	MATH 3280 Differential Equations with Linear Algebra	4	Equiv
MTH 310 Calculus III: Multivariate Calculus	4	MATH 3298 Calculus III	4	Equiv
PHY 204 General Physics II or PHY 104 Fundamental Physics II	4	PHYS 2015 General Physics II and PHYS 2016 General Physics II Lab	5	Equiv
PHY 302 Optics	3	PHYS 2022 Classical Physics	4	Sub
PHY 250 Modern Physics	3	PHYS 2021 Relativity and Quantum Physics	4	Equiv
PHY 311 Experimental Physics	2	CE 1025 Introduction to Civil Engineering	1	Sub
PHY 321 Classical Mechanics	3	CE 2017 Engineering Mechanics: Statics and Mechanics of Materials	5	Sub
PHY 320 Statics	3			
CHEM 103 General Chemistry I	5	CHEM 1153 General Chemistry I and CHEM 1154 General Chemistry Lab I	5	Equiv
CS 120 Software Design	4	CS 1411 Intro to Programming in Matlab or CS 1121 Intro to Programming in Vis Basic	4 3	Sub
PHY 497 Physics and Astronomy Seminars	2	Technical Electives	2	Equiv
PHY 411 Adv Experimental Physics Lab	1	Technical Electives	1	Equiv
PHY 334 Electrical Circuits	3	WRIT 31xx Advanced Writing	3	Sub
PHY 343 Thermodynamics	3	Technical Electives	3	Equiv
Civil Engineering Major Transfer total	52			

SECTION 2B – Civil Engineering program remaining University (receiving) Requirements – University of Minnesota Duluth

Course prefix, number and name	Credits
CE 2425 Geological Principles for Civil Engineers	4
CE 3015 CAD & Engineering Drawing	3
CE 3016 Surveying	2
CE 3025 Environmental Engineering	3
CE 3026 Project Management	3
CE 3027 Infrastructure Materials	4
CE 3115 Structural Analysis	3
CE 3221 Fluid Mechanics	3
CE 3225 Hydraulics and Hydrology	4
CE 3316 Transportation Engineering	4
CE 3426 Soil Mechanics	4
CE 4255 Senior Design	4
Civil Engineering Program Electives	15
Total Remaining University Credits for Civil Engineering B.S.C.E.	**56**

SECTION 2C – Summary of Total Program Credits for Civil Engineering B.S.C.E.

University of Wisconsin La Crosse (sending) credits		University of Minnesota Duluth (receiving) requirements
UWL General Education/UMD Liberal Education	37	
Civil Engineering Major Transfer	52	

Total College Credits	89	**Total College Credits Applied**	89
			56
		Total Program Credits	145

Special Notes:
University of Minnesota Duluth requires:

- All upper-division CE courses to be completed at the University of Minnesota Duluth
- Acceptance of PHY 103 and 104 as substitutions for the Calculus based physics sequence at UMD are based upon completion of higher level physics classes that involve the use of calculus
- All courses are taken for grade
- A cumulative grade point average of at least 2.5 for the following courses, with a grade of at least C- in each course, while enrolled at the University of Wisconsin La Crosse:
  - ENG 110 College Writing
  - MTH 207 Calculus I
  - MTH 208 Calculus II
  - MTH 309 Linear Algebra with Differential Equations
  - PHY 203 General Physics I or PHY 103 Fundamental Physics I
  - CHM 103 General Chemistry I
  - CS 120 Software Design I
  - PHYS 311 Experimental Physics
  - PHYS 320 Statics
  - PHYS 321 Classical Mechanics

Admission to the upper division Civil Engineering B.S.C.E. program is selective and is based on performance in lower division courses and space availability. To be considered, students must complete the Civil Engineering Application to upper division.

Table 3. Articulation for B.S.E.E. in Electrical Engineering

SECTION 3A – Electrical Engineering Major (pre-requisite courses, required core courses, or electives (restricted or general) within the major)				
MTH 208 Calculus II	4	MATH 1297 Calculus II	5	Equiv
MTH 245 Probability and Statistics	4	STAT 3611 Introduction to Probability and Statistics	3	Equiv
MTH 309 Linear Algebra with Differential Equations	4	MATH 3280 Differential Equations with Linear Algebra	4	Equiv
MTH 310 Calculus III: Multivariate Calculus	4	MATH 3298 Calculus III	4	Equiv
PHY 204 General Physics II or PHY 104 Fundamental Physics II	4	PHYS 2015 General Physics II and PHYS 2016 General Physics II Lab	5	Equiv
PHY 302 Optics	3	PHYS 2022 Classical Physics	4	Sub
PHY 250 Modern Physics	3	PHYS 2021 Relativity and Quantum Physics	4	Equiv
PHY 311 Experimental Physics	2	EE 1001 Introduction to Electrical Engineering	1	Sub
PHY 321 Classical Mechanics	3	CE 2017 Engineering Mechanics: Statics and Mechanics of Materials	5	Sub
PHY 320 Statics	3			
CHEM 103 General Chemistry I	5	CHEM 1153 General Chemistry I and CHEM 1154 General Chemistry Lab I	5	Equiv
CS 120 Software Design	4	CS 1511 Computer Science I	5	Sub
PHY 334 Electrical Circuits	3	EE 2006 Electrical Circuit Analysis	4	Equiv
PHY 335 Electronics	4	EE 2212 Electronics I	4	Equiv
Electrical Engineering Major Transfer total	**50**			

SECTION 3B – Electrical Engineering program remaining University (receiving) Requirements – University of Minnesota Duluth		
	Course prefix, number and name	Credits
	WRIT 3130 Advanced Writing: Engineering	3
	CS 3111 Computer Ethics or PHIL 3242 Values and Technology or PHIL Environmental Ethics	4 3 4
	EE 1315 Digital Logic	4
	EE 2111 Linear Systems and Signal Analysis	4
	EE 2325 Microprocessor Systems	4
	EE 3151 Control Systems	4
	EE 3235 Electronics II	4
	EE 3445 Electromagnetic Fields	3
	EE 4899 Senior Design Project I and EE 4999 Senior Design Project II Or EE 4951 Design Workshop	4
	Electrical Engineering Program Electives	21
	Total Remaining University Credits for Electrical Engineering B.S.E.E.	**55**

SECTION 3C – Summary of Total Program Credits for Electrical Engineering B.S.E.E.			
University of Wisconsin La Crosse (sending) credits		**University of Minnesota Duluth (receiving) requirements**	
UWL General Education/UMD Liberal Education	37		
Civil Engineering Major Transfer	50		
Total College Credits	87	**Total College Credits Applied**	87
			55
		Total Program Credits	142

Special Notes:
University of Minnesota Duluth requires:

- All upper-division EE courses to be completed at the University of Minnesota Duluth
- Acceptance of PHY 103 and 104 as substitutions for the Calculus based physics sequence at UMD are based upon completion of higher level physics classes that involve the use of calculus
- All courses are taken for grade
- A cumulative grade point average of at least 2.5 for all courses taken while enrolled at the University of Wisconsin La Crosse.

Admission to the upper division Electrical Engineering B.S.E.E. program is selective and is based on performance in lower division courses and space availability.

Table 4. Articulation for B.S.I.E. in Industrial Engineering

SECTION 4A – Industrial Engineering Major (pre-requisite courses, required core courses, or electives (restricted or general) within the major)				
MTH 208 Calculus II	4	MATH 1297 Calculus II	5	Equiv
MTH 245 Probability and Statistics	4	STAT 3411 Engineering Statistics	3	Sub
MTH 309 Linear Algebra with Differential Equations	4	MATH 3280 Differential Equations with Linear Algebra	4	Equiv
MTH 310 Calculus III: Multivariate Calculus	4	MATH 3298 Calculus III	4	Equiv
PHY 204 General Physics II or PHY 104 Fundamental Physics II	4	PHYS 2015 General Physics II and PHYS 2016 General Physics II Lab	5	Equiv

PHY 302 Optics	3	PHYS 2022 Classical Physics	4	Sub
PHY 250 Modern Physics	3	PHYS 2021 Relativity and Quantum Physics	4	Equiv
PHY 311 Experimental Physics	2	ENGR 1210 Introduction to Engineering	2	Sub
PHY 320 Statics	3	CE 2017 Engineering Mechanics	5	Sub
PHY 321 Classical Mechanics	3	ME 2226 Dynamics	3	Sub
CHEM 103 General Chemistry I	5	CHEM 1153 General Chemistry I and CHEM 1154 General Chemistry Lab I	5	Equiv
CS 120 Software Design	4	CS 1411 Intro to Programming in Matlab	4	Sub
PHY 334 Electrical Circuits	3	EE 2006 Electrical Circuit Analysis	4	Equiv
PHY 343 Thermodynamics	3	ME 2211 Thermodynamics	3	Equiv
Industrial Engineering Major Transfer total	49			

SECTION 4B – Industrial Engineering program remaining University (receiving) Requirements – University of Minnesota Duluth

Course prefix, number and name	Credits
WRIT 3130 Advanced Writing	3
ACCT 2001 Principles of Financial Accounting or BLAW 2001 The Legal Environment or MGTS 1101 Introduction to Business or MKTG 3701 Principles of Marketing	3
EMGT 4110 Engineering Professionalism and Practice	2
ENGR 1222 Introduction to Solid Modeling	2
IE 3115 Operations Research	4
IE 3122 Materials Engineering Lab	2
IE 3125 Engineering Economic Analysis	3
IE 3130 Materials Process Engineering	3
IE 3140 Human Factors and Ergonomic Design	3
IE 3222 Occupational Systems Lab	2
IE 4010 Six Sigma Quality Control	3
IE 4020 Lean Production Management	3
IE 4115 Facility Planning and Simulation	4
IE 4222 Systems Integration Lab	2
IE 4230 Systems Integration	3
IE 4255 Multidisciplinary Senior Design	4
IE 4993 Industrial Engineering Seminar	1
ME 2150 Introduction to Material Science for Engineers	3
Industrial Engineering Electives	3
Technical Electives	3
Total Remaining University Credits for Industrial Engineering B.S.I.E.	**56**

SECTION 4C – Summary of Total Program Credits for Industrial Engineering B.S.I.E.

University of Wisconsin La Crosse (sending) credits		University of Minnesota Duluth (receiving) requirements	
UWL General Education/UMD Liberal Education	37		
Industrial Engineering Major Transfer	49		
Total College Credits	86	**Total College Credits Applied**	86
			56

	Total Program Credits	142

Special Notes:
University of Minnesota Duluth requires:

- All upper-division IE courses to be completed at the University of Minnesota Duluth
- Acceptance of PHY 103 and 104 as substitutions for the Calculus based physics sequence at UMD are based upon completion of higher level physics classes that involve the use of calculus
- All courses are taken for grade
- A cumulative grade point average of at least 2.5 for all courses taken while enrolled at the University of Wisconsin La Crosse.

Admission to the upper division Industrial Engineering B.S.I.E. program is selective and is based on performance in lower division courses and space availability. To be considered, students must complete the Industrial Engineering Application to upper division.

Table 5. Articulation for B.S.M.E. in Mechanical Engineering

SECTION 4A – Mechanical Engineering Major (pre-requisite courses, required core courses, or electives (restricted or general) within the major)				
MTH 208 Calculus II	4	MATH 1297 Calculus II	5	Equiv
MATH 245 Probability and Statistics	4	STAT 3411 Engineering Statistics	3	Sub
MTH 309 Linear Algebra with Differential Equations	4	MATH 3280 Differential Equations with Linear Algebra	4	Equiv
MTH 310 Calculus III: Multivariate Calculus	4	MATH 3298 Calculus III	4	Equiv
PHY 204 General Physics II or PHY 104 Fundamental Physics II	4	PHYS 2015 General Physics II and PHYS 2016 General Physics II Lab	5	Equiv
PHY 302 Optics	3	PHYS 2022 Classical Physics	4	Sub
PHY 250 Modern Physics	3	PHYS 2021 Relativity and Quantum Physics	4	Equiv
PHY 311 Experimental Physics	2	ENGR 1210 Introduction to Engineering	2	Sub
PHY 321 Classical Mechanics	3	CE 2017 Engineering Mechanics: Statics and Mechanics of Materials	5	Sub
PHY 320 Statics	3			
CHEM 103 General Chemistry I	5	CHEM 1153 General Chemistry I and CHEM 1154 General Chemistry Lab I	5	Equiv
CS 120 Software Design	4	CS 1411 Intro to Programming in Matlab	4	Sub
PHY 334 Electrical Circuits	3	EE 2006 Electrical Circuit Analysis	4	Equiv
PHY 343 Thermodynamics	3	ME 2211 Thermodynamics	3	Equiv
PHY 321 Classical Mechanics	3	ME 2226 Dynamics	3	Equiv
Mechanical Engineering Major Transfer total	52			

SECTION 4B – Mechanical Engineering program remaining University (receiving) Requirements – University of Minnesota Duluth		
	Course prefix, number and name	Credits
	WRIT 31xx Advanced Writing	3
	EMGT 4110 Engineering Professionalism and Practice	2
	ENGR 1222 Introduction to Solid Modeling	2
	IE 3122 Materials Engineering Lab	2
	IE 3125 Engineering Economic Analysis	3
	IE 3130 Materials Processing Engineering	3
	IE 4993 Industrial Engineering Seminar	1
	ME 3140 System Dynamics and Control	3

	ME 3222 Controls and System Lab	3
	ME 3230 Kinematics and Mechatronics	3
	ME 4112 Heat and Mass Transfer	3
	ME 4122 Heat Transfer, Thermodynamics and Fluid Mechanics Lab	2
	ME 4145 CAD/CAM	4
	ME 4175 Machine Design	3
	ME 4255 Multidisciplinary Senior Design	4
	ME 4111 Fluid Mechanics or CHE 3111 Fluid Mechanics	3
	Mechanical Engineering Advanced Electives	3
	Technical Electives	3
	Total Remaining University Credits for Mechanical Engineering B.S.M.E.	**50**

SECTION 4C – Summary of Total Program Credits for Mechanical Engineering B.S.M.E.

University of Wisconsin La Crosse (sending) credits		**University of Minnesota Duluth (receiving) requirements**	
UWL General Education/UMD Liberal Education	37		
Civil Engineering Major Transfer	52		
Total College Credits	89	**Total College Credits Applied**	89
			50
		Total Program Credits	139

Special Notes:
University of Minnesota Duluth requires:

- All upper-division ME courses to be completed at the University of Minnesota Duluth
- Acceptance of PHY 103 and 104 as substitutions for the Calculus based physics sequence at UMD are based upon completion of higher level physics classes that involve the use of calculus
- All courses are taken for grade
- A cumulative grade point average of at least 3.0 for all courses taken while enrolled at the University of Wisconsin La Crosse.

Admission to the upper division Mechanical Engineering B.S.M.E. program is selective and is based on performance in lower division courses and space availability. To be considered, students must complete the Mechanical Engineering Application to upper division.

Signatures Section

University of Wisconsin La Crosse	Name	Signature	Date
Chief Academic Officer	BETSY MORGAN		
Provost Title			2/7/2017
University of Minnesota Duluth	**Name**	**Signature**	**Date**
Chief Academic Officer			
Executive Vice Chancellor Title	Fernando Delgado		11/30/17