Suggested Transfer Pathway
Montgomery College A.S. in General Engineering to UMBC's B.S. in Chemical Engineering, Bioengineering Track

Year One – Montgomery College

	Fall Semester	Cr
	CHEM131 Principles of Chemistry I	4
	ENES100 Intro to Engineering Design	3
	ENGL101 Introduction to College Writing *	3
	MATH181 Calculus	4
	Arts Distribution	3
	Total Credits	**14-17**

	Spring Semester	Cr
	CHEM132 Principles of Chemistry II	4
	ENGL102 or ENGL103, English Foundation	3
	MATH182 Calculus II	4
	BIOL150 Principles of Biology	4
	PHYS161 Mechanics and Heat	3
	Total Credits	**18**

Year Two – Montgomery College

	Fall Semester	Cr
	CHEM203 Organic Chemistry I	5
	MATH280 Multivariable Calculus	4
	HLTH100 Principles of Healthier Living	1
	PHYS262 General Physics II	4
	Behavioral and Social Science s Distribution ‡	3
	Total Credits	**17**

	Spring Semester	Cr
	Humanities Distribution, language recomm. ††	3
	MATH282 Differential Equations	3
	Behavioral and Social Science ‡	3
	CHEM204 Organic Chemistry II	5
	ENES240 Scientific Engineering Computation	3
	Total Credits	**17**

Apply to graduate from Montgomery College with an Associate of Science in General Engineering

Students must enroll in and successfully complete ENCH 215 - Chemical Engineering Analysis (3 credits), BIOL 302 Molecular & General Genetics (4 credits) and BIOL 303 Cell Biology (3 credits) at UMBC during the summer in order to begin the following academic year at junior standing. Please note that the gateway requirements must also be successfully completed.

* If needed for EN102, if not no substitution required.

‡ Select from two different disciplines, one course must also meet MC's Global & Cultural requirement

††All UMBC students are required to complete language at 201 level, students should plan to complete language pre-requisites unless exempt, see exceptions here: www.umbc.edu/mll/gfrs.html

Students are admitted to the Chemical Engineering program only when they pass the following Gateway courses with at least two B's and two C's: MATH 152 (MATH 182), and ENES 101 (ENES 100) and CHEM 102 (CHEM 132), and ENCH 215 (@UMBC) . Students must also pass ENES 240 and CHEM 131 with a grade of C or better.

Upon enrollment, UMBC will determine the transferability of any courses not taken at MC. Students should be prepared to provide syllabi, course descriptions, exams and homework as requested.

Year Three – UMBC

	Fall Semester	Cr
	ENCH 225 Chem Eng Prob Solv & Exp Design	4
	ENCH 300 Chemical Process Thermodynamics	3
	ENCH 425 Transport Processes I	3
	CHEM 437 Comprehensive Biochemistry I	4
	Physical Education Elective Ω	0
	Total Credits	**14**

	Spring Semester	Cr
	CHEM 303 Physical Chem for Biochem Sci	3
	ENCH 427 Transport Processes II	3
	ENCH 440 Chemical Engineering Kinetics	3
	ENCH 442 Chemical Process Control & Safety	3
	Language 201††	4
	Physical Education Elective Ω	0
	Total Credits	**16**

Year Four - UMBC

	Fall Semester	Cr
	ENCH 444 Process Eng Economics & Design I	3
	ENCH 445 Separation Processes	3
	ENCH 482 Biochemical Engineering	3
	ENCH XXX Engineering Elective	3
	Culture GEP Elective	3
	Total Credits	**15**

	Spring Semester	Cr
	ENCH 446 Process Eng Economics & Design II	4
	ENCH 485L Bioengineering Laboratory	4
	ENCH XXX Engineering Elective	3
	Physical Education Elective Ω	0
	AH GEP Elective	3
	Total Credits	**14**

Ω Two activity courses are required prior to graduation (unless 30 or older, exempted based on a qualified physical disability or a military veteran).

MC A.S. in General Engineering to UMBC B.S. in Chemical Engineering, Bioengineering Track

Total Credits: 65-68, Catalog Edition 13-14

Name:	**Date:**	**ID#**	
Foundation Courses	**COURSE**	**HRS**	**GRADE**
English 101*	ENGL101*	(3)	
English Foundation	ENGL102 or ENGL109	3	
Math Foundation	MATH181	4	
Health Foundation (HLHF)	HLTH100	1	

Distribution Courses	**COURSE**	**HRS**	**GRADE**
Arts Distribution (ARTD)		3	
Humanities Distribution (HUMD), language recommended ††		3	
Behavioral / Social Science Distribution (BSSD)‡		3	
Behavioral / Social Science Distribution (BSSD)‡		3	
Natural Sciences Distribution with Lab (NSLD)	PHYS262	4	
Natural Sciences Distribution with Lab (NSLD)	CHEM131	4	

Curriculum Requirements	**COURSE**	**HRS**	**GRADE**
Mechanics and Heat	PHYS161	3	
Introduction to Engineering Design	ENES100	3	
Calculus II	MATH182	4	
Multivariable Calculus	MATH280	4	
Differential Equations	MATH282	3	
EE or ES ELECTIVE- Scientific and Engineering Computation	ENES240	3	
EE, ES or Science ELECTIVE- Principles of Biology	BIOL150	4	
EE, ES or Science ELECTIVE- Organic Chemistry I	CHEM203	5	
EE, ES or Science ELECTIVE- Organic Chemistry II	CHEM204	5	
ELECTIVE- Principles of Chemistry II	CHEM132	4	

Global & Cultural Perspectives Requirement: ‡	Total Credits:

* If needed for EN102, if not no substitution required.

‡ Select from two different disciplines, one course must also meet MC's Global & Cultural requirement

††All UMBC students are required to complete language at 201 level, students should plan to complete language pre-requisites unless exempt, see exceptions here: www.umbc.edu/mll/gfrs.html

COMPETITIVE ADMISSION: Students are admitted to the Chemical Engineering program only when they pass the following Gateway courses with at least two B's and two C's: MATH 152 (MATH 182), and ENES 101 (ENES 100) and CHEM 102 (CHEM 132), and ENCH 215 (@UMBC) . Students must also pass ENES 240 and CHEM 131 with a grade of C or better.

Upon enrollment, UMBC will determine the transferability of any courses not taken at MC. Students should be prepared to provide syllabi, course descriptions, exams and homework as requested.

PROGRAM ARTICULATION AGREEMENT

The following details a recommended course of study for students earning the Associate of Science degree in General Engineering at MC transferring to UMBC in pursuit of the Bachelor of Science degree in Chemical Engineering. Where noted, course equivalencies, general education and major applicability are indicated.

Montgomery College Present Course Number (Course Number as of fall 2014)	**Montgomery College Course Title**	**Montgomery College Credits**	**UMBC Equivalency**	**UMBC General Education Requirement**	**Notes**
General Requirements					
EN101 (ENGL101)	Introduction to College Writing	3	LLE		If needed as pre-req for EN102, otherwise not required
EN102/109 (ENGL102/103)	Critical Reading/Writing and Research or Critical Reading/Writing and Research at Work	3	ENGL 100	EN	
CH101 (CHEM131)	Principles of Chemistry I	4	CHEM 101	SL	Students must take both CH101 and 102 to receive CHEM101 and CHEM102+L credit
PH262 (PHYS262)	Electricity and Magnetism	4	PHYS 122		
MA181 (MATH181)	Calculus	4	MATH 151	M	
BSSD	Behavioral and Social Sciences Distribution	3	SS	SS[1]	
BSSD	Behavioral and Social Sciences Distribution	3	SS	SS[1]	
HUMD	Humanities Distribution	3	AH or C	AH [1]	If student completes 100 level language course this will satisfy one C instead of AH
HE 100 or any HE (HLTH100 or any HLTH)	Health Foundation	1	SS	SS[1]	HE100 Principles of Healthier Living Recommended
ARTD	Arts Distribution	3	AH	AH[1]	
Total General Requirements		28-31			

Program Requirements					
CH102 (CH132)	Principles of Chemistry II	4	CHEM 102 +L		Students must take both CH101 and 102 to receive CHEM101 and CHEM102+L credit
ES100 (ENES100) and ES240 (ENES240)	Intro to Engineering Design and Scientific and Engineering Computation	6	ENES 101		Must take both ES 100 and ES 240 to receive credit for ENES101
MA182 (MATH182)	Calculus II	4	MATH 152		
MA280 (MATH280)	Multivariable Calculus	4	MATH 251		
MA282 (MATH282)	Differential Equations	3	MATH 225		
BI107 (BIOL150)	Principles of Biology	4	BIOL141		
PH161 (PHYS161)	Mechanics and Heat	3	PHYS 121		
CH203 (CHEM203)	Organic Chemistry I	5	CHEM351		
CH204 (CHEM204)	Organic Chemistry II	5	CHEM352		
Total Program Requirements		38			
		66-69			
Total Number of Credits Required for *Chemical Engineering* degree		132			
Maximum Number of Transfer Credits Applied Towards *Chemical Engineering* degree		65			

[1] These courses satisfy the general categories as indicated. To view specific course equivalency, consult ARTSYS (artsys.usmd.edu).

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Legend

AH	Arts/Humanities
C	Culture
EN	English Composition
L	Language
LLE	Lower Level Elective
M	Mathematics
PE	Physical Education
S	Science
SL	Science (plus lab)
SS	Social Sciences