



CHEMICAL BIOCHEMICAL AND ENVIRONMENTAL ENGINEERING

B.S. Chemical Engineering - Biotechnology & Bioengineering Track

Sample Academic Pathway

Degree Requirements		Curriculum Notes		
Total Credits: 133 Major Credits: 105 Minimum Cumulative GPA: 2.0 Minimum Major GPA: 2.0		<ul style="list-style-type: none"> This plan assumes no AP/IB/CLEP or transfer credit <u>and</u> foreign language proficiency up to the 201 level This major can provide all upper-level (300 or 400) credits toward the 45-total needed to earn a UMBC degree. Courses with an * symbol are benchmark requirements that should be completed during the designated semester Unless designated, electives can be taken within or outside of the major <p>For complete information on degree requirements, reference the Undergraduate Course Catalog (catalog.umbc.edu). Your personal program of study may vary.</p>		
FALL SEMESTER		SPRING SEMESTER		
	Course	Credits	Course	Credits
Freshman	CHEM 101 (S non-lab GEP) Principles of Chemistry I	4	CHEM 102 Principles of Chemistry II	4
	MATH 151 (MATH GEP) Calculus & Analytic Geometry I	4	CHEM 102L (S w/ lab GEP) Introductory Chemistry Lab	2
	ENES 101/101Y/101H Introduction to Engineering	3-4	PHYS 121 Introductory Physics I	4
	ENGL GEP	3	MATH 152 Calculus & Analytic Geometry II	4
	AH GEP	3	BIOL 141 Foundations of Biology: Cells, Energy & Organisms	4
	Total:	17-18	Total:	18
	Course	Credits	Course	Credits
Sophomore	ENCH 215 Chemical Engineering Analysis	3	ENCH 225 Chemical Engineering Problem Solving & Experiment Design Lab	4
	CHEM 351 Organic Chemistry I	3	CHEM 352 Organic Chemistry II	3
	MATH 251 Multivariable Calculus	4	MATH 225 Introduction to Differential Equations	3
	BIOL 302 Molecular & General Genetics	4	PHYS 122 Introductory Physics II	4
	AH GEP	3	BIOL 303 Cell Biology	3
	Total:	17	Total:	17
	Course	Credits	Course	Credits
Junior	ENCH 300 Chemical Process Thermodynamics	3	ENCH 427 Transport Processes II: Mass Transfer	3
	ENCH 425 Transport I: Fluids	3	ENCH 440 Chemical Engineering Kinetics	3
	CHEM 437 Comprehensive Biochemistry I	4	ENCH 442 Chemical Engineering Systems Analysis	3
	Foreign Language 201	4	CHEM 303 Physical Chemistry for Biochemical Science	3
	AH GEP	3	SS GEP	3
	Total:	17	Total:	15
	Course	Credits	Course	Credits
Senior	ENCH 444 Process Engineering Economics & Design	3	ENCH 446 Process Engineering Economics & Design II	4
	ENCH 445 Separation Processes	3	ENCH 485L Bioengineering Laboratory	4
	ENCH 482 Biochemical Engineering	3	ENCH XXX Chemical Engineering Elective	3
	ENCH XXX Chemical Engineering Elective	3	SS GEP	3
	C GEP	3		
	SS GEP	3		
Total:	18	Total:	14	