



Chemical
Biochemical and
Environmental
Engineering

Comparison of Chemical Engineering (ENCH) B.S.

All tracks lead to the Bachelors of Science in Chemical Engineering (ENCH) and require the same chemical engineering core classes. The primary differences are in the science courses and technical electives. Prerequisites must be fulfilled to register for courses and meet the degree requirements. **More details at:** cbee.umbc.edu/ench

1st and 2nd Years

1st Year	Traditional Track	Biotechnology & Bioengineering Track	Environmental Engineering & Sustainability Track
Fall Semester	CHEM 101 - Principles of Chemistry (4)		
	MATH 151 Calculus and Analytic Geometry I (4)		
	ENES 101 Introductory Engineering Science (3) *		
	GEP electives (6)		
Credits	17	17	17
Spring Semester	CHEM 102 Principles of Chemistry II (4) *		
	CHEM 102L Introductory Chemistry Lab (2)		
	PHYS 121 Introductory Physics I (4)		
	MATH 152 Calculus and Analytic Geometry II (4) *		
	ENME 110 Statics (3)	BIOL 141 Intro to Biology I (4)	ENME 110 Statics (3)
Credits	17	18	17

2nd Year	Traditional Track	Biotechnology & Bioengineering Track	Environmental Engineering & Sustainability Track
Fall Semester	ENCH 215 Chemical Engineering Analysis (3) *		
	CHEM 351 Organic Chemistry I (3)		
	MATH 251 Multivariable Calculus (4)		
	GEP electives (3)		
	PHYS 122 Introductory Physics II (4)	BIOL 302 Molecular and General Genetics (4)	PHYS 122 Introductory Physics II (4)
Credits	17	17	17
Spring Semester	ENCH 225L Chem Eng Problem Solving and Exp Design (4)		
	MATH 225 Introduction to Differential Equations (3)		
	CHEM 351L Organic Chemistry Lab I (2)	CHEM 352 Organic Chemistry II (3)	CHEM 352 Organic Chemistry II (3)
	Advanced Science elective (3)	BIOL 303 Cell Biology (3)	Advanced Science elective (3) or ENCH 210 Intro to Environmental Engineering (3)
	GEP electives (6)	PHYS 122 Introductory Physics II (4)	GEP electives (3)
Credits	18	17	16

* **Gateway Courses:** Chemical Engineering Gateway Courses: ENES 101, MATH 152, CHEM 102, ENCH 215 . Students are identified as pre-chemical engineering (PECH) until they pass (see policies for passing requirements for Gateway Courses) the required 4 courses. Students must select a track to complete—Traditional, Biotechnology/Bioengineering or Environmental Engineering and Sustainability.

Advising: Students taking the Gateway courses are advised by COEIT Advising. <https://advising.coeit.umbc.edu/>.



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3rd and 4th Years

3rd Year	Traditional Track	Biotechnology & Bioengineering Track	Environmental Engineering & Sustainability Track
Fall Semester	ENCH 300 Chemical Process Thermodynamics (3)		
	ENCH 425 Transport Processes I (3)		
	CHEM 301 Physical Chemistry I (4)	CHEM 437 Comprehensive Biochemistry I (4)	ENCH 410 Environmental Chemistry and Biology (3)
	CHEM 311L Advanced Laboratory I (3)	--	--
	GEP elective (4)	GEP elective (7)	GEP elective (7)
Credits	17	17	16
Spring Semester	ENCH 427 Transport Processes II (3)		
	ENCH 440 Chemical Engineering Kinetics (3)		
	ENCH 442 Chemical Process Control and Safety (3)		
	CHEM 302 Physical Chemistry II (3)	CHEM 303 Physical Chemistry for Biochemical Sciences (3)	CHEM 303 Physical Chemistry for Biochemical Sciences (3)
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Credits	12	12	15

4th Year	Traditional Track	Biotechnology & Bioengineering Track	Environmental Engineering & Sustainability Track
Fall Semester	ENCH 444 Process Engineering Economics and Design I (3)		
	ENCH 445 Separation Processes (3)		
	ENCH 437L Chemical Engineering Laboratory (3)	ENCH 482 Biochemical Engineering (3)	ENCH 437L Chemical Engineering Laboratory (3)
	ENCH XXX Chemical Engineering elective (3)	ENCH XXX Chemical Engineering elective (3)	ENCH 414 Environmental Biological Processes (3)
	GEP elective (3)	GEP elective (6)	GEP elective (3)
Credits	15	18	15
Spring Semester	ENCH 446 Process Engineering Economics and Design II (4)		
	GEP elective (6)		
	--	ENCH 485L Bioengineering Laboratory (4)	--
	ENCH XXX Chemical Engineering elective (6)	ENCH XXX Chemical Engineering elective (3)	ENCH XXX Chemical Engineering elective (6)
Credits	16	17	16
TOTAL CREDITS	129	133	129