CHEMICAL ENGINEERING CURRICULUM 2023-24 with BIOMOLECULAR ENGINEERING CONCENTRATION

Students also have the option of earning a Bachelor of Science degree in Chemical Engineering with a Biomolecular Concentration. The concentration is a modified version of the BSChE curriculum that devotes some credit hours to a stronger emphasis in biomolecular engineering and science.

Freshman Year			
Fall Semester		Spring Semester	
CH 1010 General Chemistry[1]	4	CH 1020 General Chemistry	4
ENGL 1030 Composition and Rhetoric[1]	3	CHE 1300 Introduction to Chemical Engineering[1]	3
ENGR 1020 Engineering Disciplines and Skills[1,2]	3	MATH 1080 Calculus of One Variable II[1]	4
MATH 1060 Calculus of One Variable I[1,3]	4	PHYS 1220 Physics with Calculus I[1]	3
Arts and Humanities/Social Science[4]	3	General Education Requirement[4]	3
Semester Totals:	17	*Semester Totals:*	17
Optional Summer Semester			
Consult with advisor for available course(s).			
Sophomore Year			
BIOL 1100 Principles of Biology I[5]	4	CH 2240 Organic Chemistry	3
CH 2230 Organic Chemistry	3	CH 2290 Organic Chemistry Laboratory[6]	1
CHE 2110 Mass and Energy Balances	4	CHE 2200 Chemical Engineering Thermodynamics I	3
MATH 2060 Calculus of Several Variables	4	CHE 2300 Fluids/Heat Transfer	4
Arts and Humanities/Social Science[1]	3	MATH 2080 Introduction to Ordinary Differential Equations	4
Semester Totals:	18	*Semester Totals:*	15
Junior Year			
BMOL 4250 Biomolecular Engineering	3	BIOE 3020 Biomaterials	3
CHE 3210 Chemical Engineering Thermodynamics II	3	BIOL 4340 Biological Chemistry Laboratory Techniques	2
CHE 3300 Mass Transfer and Separation Processes	4	CHE 3070 Unit Operations Laboratory I	3
PHYS 2210 Physics with Calculus II	3	CHE 3190 Engineering Materials	3
STAT 4110 Statistical Methods for Process Development and Control	3	Biochemistry Requirement[7]	3
		General Education Requirement	3
Semester Totals:	16	*Semester Totals:*	17
Optional Summer Semester			
Consult with advisor for available course(s).			
Senior Year			
BCHM 4310 Physical Biochemistry	3	BMOL 4290 Bioprocess Engineering	3
CHE 4070 Unit Operations Laboratory II	3	CHE 4530 Process Dynamics and Control	3
CHE 4310 Chemical Process Design I	3	CHE 4330 Process Design II	3
CHE 4430 Safety, Environmental and Professional Practice I	3	CHE 4440 Safety, Environmental and Professional Practice II	1
CHE 4500 Chemical Reaction Engineering	3	Engineering Requirement[8]	3
Semester Totals:	15	Global Challenges Requirement[4,9]	3
		Semester Totals:	16
			Total: 131 Hours

Notes:

[1] Must be passed with a grade of *C* or better.

[2] The combination of **ENGR 1050** and **ENGR 1060** or the combination of **ENGR 1510** and **ENGR 1520** may be substituted for **ENGR 1020**.
[3] Depending on a student's Clemson Mathematics Placement Test score, **MATH 1040** and **MATH 1070** may be substituted for **MATH 1060**; or the student may be required to take **MATH 1050** before enrolling in **MATH 1060**.
[4] See **General Education Requirements**. Three General Education credits must also satisfy the South Carolina REACH Act Requirement. See the South Carolina REACH Act Requirement in the **Academic Regulations** section.
[5] **BIOL 1030**, **BIOL 1040**, **BIOL 1050**, and **BIOL 1060** may be substituted for **BIOL 1100**.
[6] **CH 2270** and **CH 2280** may be substituted for **CH 2290**.
[7] Select from **BCHM 3010**, **BCHM 3050**, **BCHM 4230** or **CH 3600**.
[8] Select from **BE 4280**, **BE 4350**, **BIOE 4400**, **BIOE 4490**, **BIOE 4760**, **BMOL 4030**, **BMOL 4270**, **CHE 4010** or **MICR 4130**.
[9] Select a three-credit 3000- or 4000-level course that satisfies the Global Challenges General Education Requirement.

ADDITIONAL NOTES:

1. If a student has completed all of the courses listed in the General Engineering core, in order to register for a complete schedule, they may need to consider registering for courses required in the engineering degree program they intend to pursue. Students should see the list of possible courses in the Major Specific Coursework section of the **General Engineering Program** entry. Major specific coursework is coursework outside the General Engineering core that will count towards an engineering major once a student has officially changed their major. *Note that not all courses will count towards every engineering major. The courses listed in the Major Specific Coursework should not be considered alternatives or substitutes for the courses listed in the General Engineering core. If a student takes one of these other courses in place of the courses specifically listed in the General Engineering core, they could delay their eligibility to transfer from General Engineering into one of the degree-granting programs in engineering.*
2. No student may exceed a maximum of two attempts, including a *W*, to complete successfully any BMOL or CHE course.
3. In addition to institutional requirements, candidates for a BS degree in Chemical Engineering are required to have a cumulative grade-point average of 2.00 or higher in all engineering courses taken at Clemson. Undergraduate and graduate courses taught in the following rubrics are used in the calculation of a student's engineering GPA (eGPA): AMFG, AUE, BE, BIOE, BMOL, CE, CES, CHE, CME, ECAS, ECE, EES, EG, EM, ENGR, ESED, IE, ME, and MSE. All attempts of these courses with grades of *A, B, C, D, F,* and *I* are included in the calculation. Grades of *CE, CR, FGD, FGF, NP, P, SCD, SCN, SCP, TR,* and *W* are NOT included in the calculation.
4. Depending on a student's math placement, they may be invited to take part in the General Engineering Learning Community where they complete the following courses: **ENGR 1000**, **ENGR 1010**, **ENGR 1100**, **ENGR 1110**, **ENGR 1510**, and **ENGR 1520**. The combination of **ENGR 1510** and **ENGR 1520** may be substituted for **ENGR 1020**.
5. A transfer course may not be used to satisfy the General Education Global Challenges Requirement. While a transfer course may fulfill other degree requirements, students must enroll in a Clemson course(s) on the Global Challenges list to fulfill the Global Challenges Requirement.