

B.S. Chemical Engineering Curriculum

Fall Semester

Spring Semester

First Year

APMA 1110	Single Variable Calculus II ^(a)	APMA 2120	Multivariable Calculus III
CHEM 1410	General Chemistry I	CHEM 1420	General Chemistry II
CHEM 1411	General Chemistry I: Lab	CHEM 1421	General Chemistry II: Lab
ENGR 1624	Intro. to Engineering & Lab	PHYS 1425	Gen. Physics I: Mechanics, Thermo.
STS 1500	Engineering, Technol. & Society	PHYS 1429	Gen. Physics I: Workshop
		CS 111X	Intro. to Programming
		HSS Elective	

Second Year

APMA 2130	Differential Equations	APMA 3110	Applied Probability & Statistics
CHE 2215	Material & Energy Balances	CHE 2202	Thermodynamics
CHEM 2410	Organic Chemistry I	CHE 2216	Modeling & Simulation in ChE
PHYS 2415	Gen. Physics II: Elect. & Mag., Optics	CHEM 2420	Organic Chemistry II
PHYS 2419	Gen. Physics II: Workshop	STS 2XXX or 3XXX Elective ^(b)	
HSS Elective			

Third Year

CHE 3316	Chemical Thermo. & Unit Ops.	CHE 3318	Chemical Reaction Engineering
CHE 3321	Transport Processes I	CHE 3322	Transport Processes II
CHEM 3610	Physical Chemistry	CHE 3398	Chemical Engineering Lab I
CHEM 2411	Organic Chemistry Lab	Engineering Elective ^(c)	
Unrestricted Elective		HSS Elective	

Fourth Year

CHE 4474	Process Syn., Modeling & Control	CHE 4476	Chemical Engineering Design
CHE 4475	Intro. to Process Safety	CHE Elective ^(d)	
CHE 4491	Chemical Engineering Lab II	STS 4600	STS & Engineering Practice
CHE Elective ^(d)		Technical Elective ^(e)	
STS 4500	STS & Engineering Practice	Unrestricted Elective	
Unrestricted Elective			

^(a) **APMA 1110:** Students starting with APMA1090 should consult with their academic advisor as soon as possible.

^(b) **STS 2XXX or 3XXX:** Also satisfied by any course that meets the Second Writing Requirement, as specified by the College of Arts & Sciences (CLAS).

^(c) **Engineering elective:** Acceptable courses are listed via the SIS 'Academic Requirements' page (*Note:* ENGR 4880 does not satisfy the Engineering elective).

^(d) **CHE elective:** Chosen from CHE 3347, 4442, 4448, 4449, 4450, 4456, 4561*, or 4562* (*specific sections must be individually approved)

^(e) **Technical elective:** Any 2000 to 5999 course in: APMA, MATH, CHEM, PHYS, BIOL, BIOM, CHE (other than required courses), ENGR 4880, CE, CS, ECE (except ECE 2066), MSE (except MSE 2010), MAE, SYS plus ENV5 2050, 2800, 3200, 3600, 3860, 4280, 4640, 4660, 4090.

Special Topics and Special Projects courses (and other courses introduced after the 2011–2012 academic year) must be individually approved.

Pre- and co-requisites for CHE courses, chemistry courses, and minimum grade requirements

Course	Pre-requisites	Co-requisites
CHE 2202		APMA 2120
CHE 2215	CHEM 1410; APMA 1110	
CHE 2216	CS 111X; APMA 2130; CHE 2215	
CHE 3316	CHE 2202; CHE 2215	
CHE 3318	CHE 2216; CHE 3316	CHE 3322
CHE 3321	APMA 2130; CHE 2215; CHE 2216	
CHE 3322	CHE 2216; CHE 3316; CHE 3321	
CHE 3347	CHE 2246; CHE 3321; or Instructor Permission	CHE 3322; CHE 3318
CHE 3398	CHE 2215; CHE 3316; CHE 3321	CHE 3322
CHE 4442	Instructor Permission	
CHE 4448	CHE 3322	
CHE 4449		CHE 3321
CHE 4474	CHE 3318; CHE 3322	CHE 4475
CHE 4475	CHE 3318; CHE 3322	CHE 4474
CHE 4476	CHE 2216; CHE 3318; CHE 3322; CHE 4474; CHE 4475	
CHE 4491	CHE 3318; CHE 3322; CHE 3398	

Minimum Grade Requirements for ChE Prerequisite Courses

A grade of C- is the standard required in core CHE courses that are prerequisites for other CHE courses. Students cannot have more than one passing grade of less than C- in core CHE prerequisite courses in order to enroll in any subsequent CHE courses. Students with more than one grade below C- in more than one core CHE prerequisite course (CHE 2202, 2215, 2215, 3316, 3318, 3321, 3322, 3398, 4474, and 4475) will have to retake the prerequisite(s) and receive a grade of C- or higher before taking any subsequent CHE courses. This policy applies to student pursuing a B.S. in chemical engineering and to students pursuing a minor in chemical engineering.

Chemistry Course Requirements

Note: The Department of Chemistry maintains their own minimum grade requirements: <https://chemistry.as.virginia.edu/policies>

- General Chemistry: ChE students take CHEM 1410 (3 hr), CHEM 1411 (1 hr), CHEM 1420 (3 hr), and CHEM 1421 (1 hr). Students with AP Chemistry credit are still must take the CHEM 1411 and CHEM 1421 labs.
- Organic Chemistry: ChE students take CHEM 2410 (3 hr) and CHEM 2420 (3 hr) and the laboratory CHEM 2411 (3 hr).
- 1800 Series Chemistry: Students in the 1800 series of chemistry must take all the following courses in order to satisfy the chemical engineering general and organic chemistry requirements:
 - CHEM 1810 Principles of Chemical Structures (3 hr)
 - CHEM 1811 Principles of Chemical Structures Lab (3 hr)
 - CHEM 1820 Principles of Organic Chemistry (3 hr)
 - CHEM 1821 Principles of Org Chem Lab (3 hr)
 - CHEM 2810 Principles of Chemical Reactions II (3 hr)
- Physical Chemistry: ChE students take CHEM 3410 Physical Chemistry - Quantum Theory (3 hr), which is cross-listed as CHEM 3610.