MAJOR: CHEMICAL ENGINEERING, B.S.

DEPARTMENT OF CHEMICAL ENGINEERING

This chemical engineering major emphasizes the development of the student's ability to analyze and design chemical processing systems. Chemical engineering graduates are qualified for employment in diverse industries, ranging from those that manufacture inorganic chemicals, petrochemicals, plastics, synthetic fibers, paper and pulp, and pharmaceuticals to those that process hazardous and nuclear wastes. Graduates are qualified for assignments that include plant operations, process development, process control, project engineering, or sales, and frequently pursue engineering management later in their careers. They are also well qualified to continue with professional or graduate education. The Chemical Engineering program's educational objectives are to produce graduates who 1) are able to apply theoretical and practical knowledge of engineering in the workplace, 2) possess the ability to communicate effectively with technical and non-technical users of technology, 3) are prepared to engage in advanced or additional education in their chosen field of endeavor or interest, and 4) recognize that the broader aspects of engineering practices include economic, environmental, social, political and professional constraints.

TYPICAL PROGRAM OF STUDY			
FIRST YEAR			
FALL SEMESTER		**SPRING SEMESTER**	
CHE 1011 Introduction to Chemical Engineering[1]	3 cr	CHEM 1152 General Chemistry II[2]	5 cr
CHEM 1151 General Chemistry I[2]	5 cr	CS programming course [4]	2-5 cr
WRIT 1120 College Writing	3 cr	MATH 1297 Calculus II[3]	5 cr
MATH 1296 Calculus I^[3]	5 cr	PHYS 2011 General Physics I	4 cr
Total:	16 cr	Total:	16-19cr
SECOND YEAR			
CHE 2111 Material & Energy Balances	3 cr	CHE 2121 Chemical Engineering Thermodynamics	3 cr
CHEM 2541 Organic Chemistry I	3 cr	CHE 3031 Computational Methods in Chemical Eng.	3 cr
CHEM 2543 Organic Chemistry I lab	1 cr	CHEM 2222 Quantitative Analysis	3 cr
ENGR 2015 Statics	3 cr	CHEM 2223 Quantitative Analysis lab	1 cr
MATH 3280 Differential Equations w/Linear Algebra	4 cr	PHYS 2012 General Physics II	4 cr
Liberal education course[5]	3 cr	Liberal education course[5]	3 cr
Total:	17 cr	Total:	17 cr
THIRD YEAR			
CHE 2011 Design of Engineering Experiments	3 cr	CHE 3112 Heat and Mass Transfer	3 cr
CHE 3111 Fluid Mechanics	3 cr	CHE 3231 Properties of Engineering Materials	3 cr
CHE 3241 Principles of Particle Technology	3 cr	CHE 4402 Process Dynamics and Control	3 cr
CHEM 254X or higher elective[7]	4 cr	CHEM 254X elective[7]	4 cr
Science/engineering elective 3xxx level (or higher)[8]	3 cr	WRIT 3130 or 3150 Advanced Writing[6]	3 cr
Total:	16 cr	Total:	16 cr
FOURTH YEAR			
CHE 3211 Chemical Engineering lab I	3 cr	CHE 4211 Chemical Engineering lab II	3 cr
CHE 4111 Separations	3 cr	CHE 4502 Chemical Engineering Design II	4 cr
CHE 4301 Chemical Reaction Engineering	3 cr	CHE 4xxx level or higher elective[9]	3 cr
CHE 4501 Chemical Engineering Design I	4 cr	Liberal education courses[5]	6 cr
Liberal education course[5]	3 cr	Total:	16 cr
Total:	16 cr		

^First math course is determined by math placement exam. This schedule presupposes placement into Math 1296.

[1] Instead of CHE 1011, students may take CHE 2001 or, with departmental approval, a CHE elective at the 3xxx or 4xxx level.

[2] Students may take CHEM 1161/1162 Honors General Chemistry I and II in place if CHEM 1151/1152.

[3] Students may take MATH 1596/1597 Honors: Calculus I and II in place of MATH 1296/1297.

[4] Choose one of the following computer programming courses: CS 1121, CS 1131, CS 1135, CS 1511, or CS 2121.

[5] Choose one course each from liberal education categories 6-10, making sure to chose one '*' course and one '**' course. Students may choose two courses from category 9 and none from 10 as long as the category 9 courses are from two different departments.

[6] Students may take WRIT 3130 Advanced Writing: Engineering or WRIT 3150 Advanced Writing: Science.

[7] Students are required to take 8 or more credits of CHEM electives at the 254x-5xxx level. May not be satisfied with Chem 4184, 4185, 4632, 4633.

[8] Students are required to take 3 or more credits of advanced science or engineering electives at the 3xxx level or higher, subject to department approval.

[9] Students are required to take 3 or more credits of CHE electives at the 4xxx level or higher.

For additional information:

Department of Chemical Engineering
176 Engineering Building * 218-726-7126
che@d.umn.edu * http://www.d.umn.edu/che

CHEMICAL ENGINEERING, B.S.

MAJOR COURSE REQUIREMENTS	CREDITS	PREREQUISITES	SEMESTER TO BE COMPLETED	GRADE
FIRST YEAR				
WRIT 1120 College Writing	3			
CHE 1011 Introduction to Chemical Engineering[1]	3	High school chem, high school algebra		
CHEM 1151 General Chemistry I[2]	5	1 year HS chemistry; HS algebra		
CHEM 1152 General Chemistry II[2]	5	CHEM 1151		
CS programming course [4]	2-5			
MATH 1296 Calculus I^[3]	5	Math placement or Math 1250		
MATH 1297 Calculus II[3]	5	MATH 1290, 1296 or 1596 with 'C-' or better		
PHYS 2011 General Physics I	4	MATH 1296		
SECOND YEAR				
CHE 2111 Material & Energy Balances	3	CHE 1011 (or concurrent reg.), 2111, MATH 1297		
CHE 2121 Chemical Engineering Thermodynamics	3	CHEM 1151		
CHE 3031 Computational Methods in Chem. Eng	3	BSCHE candidate, CHE 2111, MATH 3280		
CHEM 2222 Quantitative Analysis	3	CHEM 1152 or 1162		
CHEM 2223 Quantitative Analysis lab	1	Concurrent registration in CHEM 2222		
CHEM 2541 Organic Chemistry I	3	CHEM 1152 or 1162		
CHEM 2543 Organic Chemistry I lab	1	CHEM 1152 or 1162; concurrent registration in CHEM 2541		
ENGR 2015 Statics	3	PHYS 2011, MATH 1297		
MATH 3280 Differential Equations w/Linear Alg.	4	Math 1297 or 1597 with 'C-' or better		
PHYS 2012 General Physics II	4	PHYS 2011, MATH 1297		
THIRD YEAR				
CHE 2011 Design of Engineering Experiments.	3	MATH 1297		
CHE 3111 Fluid Mechanics	3	ENGR 2015, MATH 3280		
CHE 3112 Heat and Mass Transfer	3	CHE 3111		
CHE 3231 Properties of Engineering Materials	3	CHE 2121, CHEM 2521 or 2541/2543,		
CHE 3241 Principles of Particle Technology	3	BSCHE cand., CHE 2111, PHYS 2012, MATH 3280		
CHE 4402 Process Dynamics and Control	3	BSCHE cand., ChE 2121, 3112, CS 11xx, Math 3280, #		
CHEM 254Xor higher elective[7]	4			
CHEM 254X or higher elective[7]	4			
WRIT 31xx Advanced Composition[6]	3	WRIT 1120, 60 credits		
3xxx or higher science or engineering elective[8]	3			
FOURTH YEAR				
CHE 3211 Chemical Engineering lab I	3	ChE 3111		
CHE 4111 Separations	3	ChE 3112		
CHE 4211 Chemical Engineering lab II	3	ChE 3211		
CHE 4301 Chemical Reaction Engineering	3	ChE 3112		
CHE 4501 Chemical Engineering Design I	4	ChE 2121, 3231 and (prereq or coreq 4111, 4211, 4301)		
CHE 4502 Chemical Engineering Design II	4	ChE 4501		
CHE 4xxx level or higher elective[9]	3			

^First math course is determined by math placement exam. This schedule presupposes placement into Math 1296.

[1] Instead of CHE 1011, students may take CHE 2001 or, with departmental approval, a CHE elective at the 3xxx or 4xxx level.

[2] Students may take CHEM 1161/1162 Honors General Chemistry I and II in place if CHEM 1151/1152.

[3] Students may take MATH 1596/1597 Honors: Calculus I and II in place of MATH 1296/1297.

[4] Choose one of the following computer programming courses: CS 1121, CS 1131, CS 1135, CS 1511, or CS 2121.

[6] Students may take any WRIT 31xx or WRIT 5220 or WRIT 5230.

[7] Students are required to take 8 or more credits of CHEM electives at the 254x-5xxx level. May not be satisfied with Chem 4184, 4185, 4632, 4633.

[8] Students are required to take 3 or more credits of advanced science or engineering electives at the 3xxx level or higher, subject to department approval.

[9] Students are required to take 3 or more credits of CHE electives at the 4xxx level or higher.

Instructor consent required

Last update: November 17, 2008