Program Coordinator: S. Pickard

The B.S. in Chemistry provides students an opportunity to receive a thorough scientific training in the context of a Christian worldview. This program integrates a strong understanding of chemical principles and quantitative problem solving with the development of hands-on research skills. Also, the Chemistry program includes a strong oral and written communication component. Thus, our students receive an educational experience that goes beyond the specific skills they need to be successful as chemists and helps them to develop into well-rounded individuals who are ready to take their place in society.

The Chemistry program has four student learning outcomes;

- Graduates will be able to demonstrate proficiency in content knowledge, including chemistry problem solving techniques.
- Graduates will be able to demonstrate proficiency in traditional chemistry lab techniques.
- Graduates will be able to demonstrate proficiency in oral scientific communication.
- Graduates will be able to demonstrate proficiency in written scientific communication.

There are three tracks within this major: General Chemistry, Health Sciences, or Chemistry Education. The General Chemistry track has a major curriculum patterned after guidelines recommended by the American Chemical Society and is the program recommended for students who wish to pursue graduate studies in chemistry. The Health Sciences track is primarily designed for students who are preparing for a career in a health profession. The Chemistry Education track prepares the student to teach chemistry in a secondary school setting.

Thus, by selecting the correct track, a chemistry major will provide an excellent background for those preparing for medical school, graduate study in chemistry, or chemical engineering. It is valuable for those who seek careers as chemists in industry, government, business, or secondary education, or in science-based activities such as chemical patent work, sales, marketing, or computer science.

Students may also choose combine a modified Chemistry major with a minor in secondary education. Science and mathematics are considered critical need areas in K-12 public education by all states.

Comprehensive Assessment
The Chemistry Capstone (CHEM 4930) and Comprehensive Assessment (CHEM 4990) are required for both the General and the Health Sciences track. CHEM 4990 is an end of program exam which tests the student’s knowledge of Chemistry in the areas of Organic, Analytical and Physical. CHEM 4930 is review course designed to prepare the student for the end of program exam, and there is a letter grade assigned for CHEM 4930. Both CHEM
4990 and 4930 are normally taken during the Fall or Spring semester leading up to the student’s graduation.

Core Curriculum Requirements
Chemistry majors should complete the King Core Curriculum as specified below. For additional course options and descriptions, please see the “The Core Curriculum” section of the catalog.

Science
CHEM 1110
General Chemistry I ................................................................. 4 s.h.

Quantitative Literacy
MATH 2350
Calculus I .................................................................................. 4 s.h.

BS in Chemistry Major Requirements
The technology requirement for a chemistry major is the minimum required by the university: namely, a laptop computer with a minimum of Microsoft Office 2010 or later, wireless capability, and a webcam.

The following courses are taken by all chemistry majors, regardless of the track they are in.

CHEM 1120
General Chemistry II ................................................................. 4 s.h.
CHEM 2110
Organic Chemistry I ................................................................. 4 s.h.
CHEM 2120
Organic Chemistry II ................................................................. 4 s.h.
CHEM 3000
Analytical Chemistry I ................................................................. 4 s.h.
CHEM 4000
Physical Chemistry I ................................................................. 5 s.h.
PHYS 2210
General Physics I ................................................................. 4 s.h.
IDST 4500
Interdepartmental Science and Mathematics Seminar ................... 2 s.h.

Track Requirements for Chemistry
Students will choose a track in either General Chemistry, Health Sciences Chemistry, or Chemistry Education.

General Chemistry Track (BS)
CHEM 3200
Analytical Chemistry II ................................................................. 4 s.h.
CHEM 4200
Physical Chemistry II ................................................................. 5 s.h.
MATH 2360
Calculus II .................................................................................. 4 s.h.
PHYS 2220
General Physics II ................................................................. 4 s.h.
CHEM 4930
Chemistry Capstone .................................................................. 1 s.h.
CHEM 4990  
Comprehensive Assessment ................................................................. 0 s.h.

Choose from the following courses .................................................. 4 s.h.
MATH 2370  
Vector Calculus (4 s.h.)
MATH 3430  
Differential Equations (4 s.h.)
PHYS 3060  
Introduction to Modern Physics (4 s.h.)
PHYS 3030  
Electricity and Magnetism (4 s.h.)

Health Sciences Chemistry Track (BS)
BIOL 3700  
Biochemistry .................................................................................. 4 s.h.
BIOL 2110  
General Biology I ............................................................................ 4 s.h.
BIOL 2120  
General Biology II ........................................................................... 4 s.h.
CHEM 4930  
Chemistry Capstone  ....................................................................... 1 s.h.
CHEM 4990  
Comprehensive Assessment ............................................................. 0 s.h.

Choose from the following ............................................................ (at least) 4 s.h.
CHEM 3200  
Analytical Chemistry II (4 s.h.)
CHEM 3300  
Advanced Organic Chemistry (4 s.h.)
CHEM 3600  
Inorganic Chemistry (4 s.h.)
CHEM 4200  
Physical Chemistry II (5 s.h.)

Summary of Total Credits
General Chemistry Track
Core Curriculum .................................................................................. 42 s.h.
Major Common Requirements ........................................................... 32 s.h.
Track Requirements ........................................................................... 17 s.h.
Electives/Minor/Second Major .......................................................... 33 s.h.
Minimum to Earn Bachelor of Science .......................................... 124 s.h.

Health Sciences Chemistry Track
Core Curriculum .................................................................................. 42 s.h.
Major Common Requirements ........................................................... 32 s.h.
Track Requirements ........................................................................... 16 s.h.
Electives/Minor/Second Major .......................................................... 34 s.h.
Minimum to Earn Bachelor of Science .......................................... 124 s.h.
Teacher Education - CHEMISTRY
The B.S. in Chemistry (Grades 6-12) is available with modifications to the Chemistry major and the King Core, and successful completion of the Secondary Education minor. Licensed teachers in secondary education are in great demand in all fifty states, and the areas of science, mathematics, English as a second language, and foreign languages are considered critical need areas in K-12 public education by all states.

Declaration of the minor and early and frequent advisement is essential to timely completion of degree and licensure requirements. Students seeking teacher licensure will be assigned a secondary education advisor in the Department of Teacher Education, in addition to their major advisor. See the “Admission to the Teacher Education Program” section of this catalog or contact the Certification Advisor in the School of Education for eligibility criteria, admissions procedures, and timelines.

Core Curriculum Requirements
Chemistry majors seeking teaching licensure should fulfill specified categories of the King Core Curriculum by taking the courses indicated below. See the “The Core Curriculum” section of the catalog for additional details on fulfillment of other categories.

Science
CHEM 1110
General Chemistry I ................................................................. 4 s.h.

Quantitative Literacy
MATH 2350
Calculus I ........................................................................ 4 s.h.

Literature/History
HUMN 2171
The Quest for a Meaningful Life I ............................................. 4 s.h.
HUMN 2172
The Quest for a Meaningful Life II ............................................. 4 s.h.

Human Culture
If language requirement is not met by proficiency, then a student must choose FREN/SPAN/GREK 2000 to satisfy requirement.

FREN 2000, SPAN 2000, GREK 2000
Intermediate Foreign Language .................................................. 4 s.h.

General Science and Physical Science Core
BIOL 2110
General Biology I ................................................................. 4 s.h.
CHEM 1120
General Chemistry II ............................................................. 4 s.h.
GEOG 2010
Physical Geography ............................................................... 3 s.h.
PHYS 2210
General Physics I ................................................................. 4 s.h.

BS in Chemistry Major Requirements for Teaching Licensure
CHEM 2110
Organic Chemistry I ............................................................. 4 s.h.
CHEM 2120
Organic Chemistry II ................................................................. 4 s.h.
CHEM 3000
Analytical Chemistry I ................................................................. 4 s.h.
CHEM 3200
Analytical Chemistry II ................................................................. 4 s.h.
CHEM 4000
Physical Chemistry I ................................................................. 5 s.h.
Interdepartmental Science Seminar ............................................. 2 s.h.

*Choose from the following courses* .................................................. 4 s.h.
MATH 2360
Calculus II (4 s.h.)
CHEM 4200
Physical Chemistry II (4 s.h.)
PHYS 2220
General Physics II (4 s.h.)

**NOTE:** *Students in the Chemistry Secondary Education track are not required to take CHEM 4930 or 4990. Instead they are required to take the PRAXIS exams for Secondary Education licensure in Chemistry.*

**Secondary Education Minor**
EDUC 2030
Introduction to Teaching: K-Grade 12 .............................................. 2 s.h.
EDUC 2031
Introduction to Teaching Practicum, Grades PreK-12 ...................... 1 s.h.
EDUC 2100
Survey of Exceptional Children ......................................................... 4 s.h.
EDUC 2370
Reflective Teaching: Planning for Classroom Instruction ............... 3 s.h.
EDUC 2900
Foundations of Education ............................................................... 3 s.h.
EDUC 2950
Technology for Teachers ................................................................. 2 s.h.
EDUC 3390*
Secondary Curriculum and Methods ............................................... 3 s.h.
EDUC 3590*
Content Area Reading ................................................................. 3 s.h.
EDUC 3600*
Assessment and Evaluation ......................................................... 3 s.h.
EDUC 4490*
Student Teaching, Grades 6-10 ....................................................... 5 s.h.
EDUC 4500*
Student Teaching, Grades 9-12 ....................................................... 5 s.h.
EDUC 4950*
Capstone Seminar, Grades K-12 ..................................................... 2 s.h.
PSCI 2120
Cultural Diversity in America ....................................................... 4 s.h.
PSYC 3320
Adolescent Development ............................................................... 4 s.h.

*Requires admittance to the Teacher Education Program*
Summary of Total Credits
Core Curriculum ................................................................. 42 s.h.
Major Requirements .......................................................... 42 s.h.
Secondary Education Minor ............................................... 44 s.h.
Electives ................................................................. 2 s.h.
Minimum to Complete Licensure Program ......................... 130 s.h.