

# Natural Science Program

## Purpose Statement

*The Department of Natural Science provides:*

- a career-oriented approach to pre-professional preparation in the health sciences
- a liberal arts and sciences approach to environmental health and sustainability
- a hands-on approach to education in the laboratory and through student research
- preparation to meet the Kansas State Department of Education standards for licensure in biology and chemistry

## Biochemistry Major (Recommended for Pre-Medical Students)

### Requirements

**G-CH 111** College Chemistry I (5 hours)  
**CH 112** College Chemistry II (5 hours)  
**CH 251** Organic Chemistry I (5 hours)  
**CH 252** Organic Chemistry II (5 hours)  
**CH 201** Quantitative Analysis (4 hours)  
**CH 370** Biochemistry (4 hours)  
**G-BI 111** College Biology I (4 hours)  
**BI 112** College Biology II (4 hours)  
**BI/CH 310** Statistical Data Analysis (4 hours)  
**BI/CH 360** Cell Physiology/Biochemistry II (4 hours)

Select one from the following:

**BI 283** Genetics (4 hours)  
**BI 334** Microbial Ecophysiology (5 hours)  
**BI 364** Cell and Molecular Biology (4 hours)  
**BI 384** Molecular Genetics (4 hours)  
**CH 390** Instrumental Analysis (3 hours)

### Required Supporting Courses

**G-PH 215** General Physics I (4 hours)  
**PH 216** General Physics II (4 hours)  
**\*NS 300** Research Methods (1 hour)  
**NS 375** Junior Seminar (1 hour)  
**\*NS 475** Senior Research (2 hours)

## Biology Major

### Requirements

*A minimum of 32 semester hours of biological science coursework, including*

**G-BI 111** College Biology I (4 hours)  
**BI 112** College Biology II (4 hours)  
**BI 283** Genetics (4 hours)  
**BI 310** Statistical Data Analysis (4 hours)

8 credit hours chosen from among the 300 Level BI Courses

### Required Supporting courses

**G-CH 111** College Chemistry I (5 hours)  
**CH 112** College Chemistry II (5 hours)  
**CH 251** Organic Chemistry I (5 hours)  
**CH 252** Organic Chemistry II (5 hours)  
**G-PH 215** General Physics I (4 hours)  
**\*NS 300** Research Methods (1 hour)  
**NS 375** Junior Seminar (1 hour)  
**\*NS 475** Senior Research (2 hours)

## Biology Major - Teaching Licensure in Biology (6-12)

### Biology Major for Teacher Licensure

A minimum of 32 semester hours, including:

**G-BI 111** College Biology I (4 hours)

**BI 112** College Biology II (4 hours)

**G-BI 201** Biodiversity (4 hours)

**BI 283** Genetics (4 hours)

**\*NS 300** Research Methods (1 hour)

**NS 375** Junior Seminar (1 hour)

12 credit hours chosen from among the remaining BI or NS courses numbered 200 or higher, including at least one organismal course and one population course.

### Required Supporting Courses

**G-CH 111** College Chemistry I (5 hours)

**CH 112** College Chemistry II (5 hours)

**CH 251** Organic Chemistry I (5 hours)

**CI 232** Educational Technology (2 hours)

**G-MA 221** Elementary Applied Statistics (4 hours)

**G-PE 170** Personal and Community Health (2 hours)

**G-PH 215** General Physics I (4 hours)

**G-PY 101** Introduction to Psychology (3 hours)

Students pursuing this major must also meet all professional requirements for teacher licensure in the Curriculum and Instruction Department.

## Biology Minor

### Requirements

A minimum of 20 semester hours, including

**G-BI 111** College Biology I (4 hours)

**BI 112** College Biology II (4 hours)

**BI 283** Genetics (4 hours)

At least eight hours of additional biology courses

### Required supporting courses

**G-CH 111** College Chemistry I (5 hours)

**CH 251** Organic Chemistry I (5 hours)

## Health Science Interdisciplinary Major

### Required Courses

**G-BI 111** College Biology I (4 hours)

**BI 112** College Biology II (4 hours)

**G-CH 111** College Chemistry I (5 hours)

**CH 112** College Chemistry II (5 hours)

**G-PH 215** General Physics I (4 hours)

**PH 216** General Physics II (4 hours)

**G-BI 210** Principles of Nutrition (3 hours)

**BI 225** Human Anatomy (4 hours)

**BI 315** Human Physiology (4 hours)

**PE 180** First Aid and Personal Safety (2 hours)

**PE 280** Care and Treatment of Athletic Injuries (3 hours)

**PE 288** Psychology and Sociology of Sport (2 hours)

**PE 330** Physiology of Exercise (3 hours)

**PE 411** Kinesiology (3 hours)

**PE/BI 445** Readings and Research: Research Methods in Health Science (1 hour)

**PE 475** Senior Seminar - Kinesiology Internship (2 hours)

**G-MA 221** Elementary Applied Statistics (4 hours)

**G-PY 101** Introduction to Psychology

### Recommended Supporting Courses

**G-PE 150** Concepts in Holistic Health (2 hours)

**G-PE 170** Personal and Community Health

### Additional Requirements for Some Pre-professional Programs

**PY 204** Child and Adolescent Development (3 hours) OR

**PY 305** Abnormal Psychology (3 hours)

**BI 207** Medical Terminology (2 hours)

**BI 404** Biomedical Ethics (2 hours)

**G-MA 105** College Algebra

Trigonometry (or above)

Communication course

Sociology course

Business course

## Chemistry Major

### Requirements

*A minimum of 36 semester hours including*

**G-CH 111** Chemistry I (5 hours)

**CH 112** Chemistry II (5 hours)

**CH 251** Organic Chemistry I (5 hours)

**CH 252** Organic Chemistry II (5 hours)

**CH 201** Quantitative Analysis (4 hours)

**CH 390** Instrumental Analysis (3 hours)

**CH 385** Advanced Inorganic Chemistry (4 hours)

**CH 400** General Physical Chemistry (5 hours)

### Required supporting courses

**PH 205** College Physics I (5 hour)

**PH 206** College Physics II (5 hour)

**\*NS 300** Research Methods (1 hour)

**NS 375** Junior Seminar (1 hour)

**\*NS 475** Senior Research (2 hours)

**G-MA 111** Calculus I (4 hours)

**MA 112** Calculus II (4 hours)

### Recommended supporting courses

**G-BI 111** College Biology I (4 hours)

**BI 112** College Biology II (4 hours)

## Chemistry Major - Teaching Licensure in Chemistry (6-12)

### Chemistry Major for Teacher Licensure:

*A minimum of 32 hours including:*

**G- CH 111** College Chemistry I (5 hours)

**G- CH 112** College Chemistry II (5 hours)

**CH 251** Organic Chemistry I (5 hours)

**CH 201** Quantitative Analysis (4 hours)

**CH 310** Statistical Data Analysis (4 hours)

**CH 385** Advanced Inorganic (4 hours)

**CH 388** Lab Assisting Internship (2 hours)

Remaining hours must come from CH 252 Organic Chemistry II or CH courses 300 level or above.

### Required courses:

**G-BI 111** College Biology I (4 hours)

**BI 112** College Biology II (4 hours)  
**PH 215** General Physics I (4 hours)  
**PH 216** General Physics II (4 hours)  
**NS 375** Junior Seminar (1 hours)

### Suggested Courses:

**G-NS 141** Environmental Science (4 hours)  
**G-PC 251** Geology (4 hours)  
**G-PC 275** Astronomy (4 hours)  
**CH 252** Organic Chemistry II (5 hours)  
**G-MA 111** Calculus I (4 hours)  
**MA 112** Calculus II (4 hours)  
**PH 205** College Physics I (replace G-PH 215) (5 hours)  
**PH 206** College Physics II (replace G-PH 216) (5 hours)  
**\*NS 475** Senior Research (2 hours)

Students pursuing this major must also meet all professional requirements for teacher licensure in the curriculum and instruction department.

## Chemistry Minor

### Requirements

*A minimum of 24 hours including*

**G-CH 111** College Chemistry I (5 hours)  
**CH 112** College Chemistry II (5 hours)  
**CH 251** Organic Chemistry I (5 hours)  
**CH 252** Organic Chemistry II (5 hours)  
**CH 201** Quantitative Analysis (4 hours)

## Environmental Stewardship Major

This program achieves its purposes when its graduates:

- demonstrate knowledge of contemporary theories in the natural sciences
- demonstrate skill in the application of laboratory and field experimental techniques
- demonstrate knowledge of contemporary theories of human social systems and behavior
- demonstrate a critical understanding of their personal rôles in history, culture, and community
- evaluate the impacts of human society and Earth's natural systems on one another
- differentiate between their personal belief system and societal belief systems
- express a personal environmental ethic

### Required Natural Science Courses:

**G-BI 106** Environmental Biology *or*  
**G-BI 201** Biodiversity (4 hours)  
**G-CH 106** Environmental Chemistry (4 hours)  
**G-NS 141** Environmental Science (4 hours)  
**G-PH 215** General Physics I (4 hours)  
**G-PC 251** Geology (4 hours)  
**G-NS 245** Climatology (4 hours)  
**BI 316** Ecology (4 hours) *or*  
**BI 325** Human Ecology, Epidemiology and Public Health (4 hours)  
**BI 334** Microbial Ecophysiology (5 hours) *or*  
**BI 345** Plant Ecophysiology (4 hours)  
**NS 404** Environmental Ethics (2 hours)  
**BI/EC 416** Ecological Economics (2 hours)  
**NS 495** Field Experience (4 hours)

### Electives from Humanities, Social Science, and Technology:

*Select at least 24 hours from the following:*

**CM 325** Conflict Communication (3 hours)  
**EC 202** Survey of Economics (3 hours)  
Up to 2 courses (G-HI or HI200+) (6 hours)

**G-PE 170** Personal/Community Health (2 hours)  
**G-PS 125** International Relations (3 hours)  
**G-PS 130** Principles of Geography (3 hours)  
**G-PS 215** Global Peace Studies (3 hours)  
**PY/SO 303** Social Psychology (3-4 hours)  
**G-SO 101** Introduction to Sociology (3 hours)  
**SO 206** Social Problems (3-4 hours)  
**SO 320** Urban Sociology (3 hours)  
**\*G-TE 333** Technology and Society (3-4 hours)

*Other courses as approved by both the advisor and co-advisor.*

### **Other Course Requirements:**

**NS 350** Stewardship Seminar 1/semester (4 required)  
**\*NS 300** Research Methods (1 hour)  
**NS 375** Junior Seminar (1 hour)  
**\*NS 475** Senior Research (2 hours)

## **Environmental Science Minor**

### **Requirements**

**G-BI 106** Environmental Biology or  
**G-CH106** Environmental Chemistry (4 hours)  
**G-NS 141** Environmental Science (4 hours)  
**G-PC251** Geology (4 hours)  
**G-NS 245** Climatology (4 hours)  
**NS 493** Field Experience (4 hours)

## **Environmental Stewardship Minor**

### **Requirements**

**G-NS 141** Environmental Science (4 hours)  
**G-PC 251** Geology or  
**G-PC245** Climatology (4 hours)  
**NS495** Field Experience (4 hours)  
**NS350** Stewardship Seminar (2 hours)

Electives from Environmental Stewardship Major Electives list (6 hours)