

## Curriculum Guidelines for the Program in Science Education Science Content Requirements Section

### Chemistry teaching concentration (57)

BIO101 & 101L Principles of Biology I (4 credits)  
ENVI170 & 170L Earth Science (4 credits)  
CHEM105 & 105L General Chemistry I (4 credits)  
CHEM106 & 106L General Chemistry II (4 credits)  
MATH 131 Calculus I (4 credits)  
MATH 132 Calculus II (4 credits)  
PHYS105 & 105L General Physics I (4 credits)  
PHYS 106 & 106L (4 credits) General Physics II  
CHEM 351 & 351L Organic Chemistry I (4 credits)  
CHEM 352 & 352L Organic Chemistry II (4 credits)  
CHEM 321 & 321L Analytical Chemistry (4 credits)  
CHEM 431 & 431L Biochemistry I (4 credits)  
CHEM 341 Inorganic Chemistry (3 credits)  
CHEM 405-Senior Seminar (1 credit)  
CHEM 461 & 461L Physical Chemistry I (5 credits)  
Advanced Electives (3 credits): CHEM 3@ or 4@ or SCED396L or SCED398L or EXCEPT  
CHEM 330 and 330L and 399.

### Physics teaching concentration (50 credits)

BIO101 & 101L Principles of Biology I (4 credits)  
ENVI170 & 170L Earth Science (4 credits)  
CHEM105 & 105L General Chemistry I (4 credits)  
PHYS115 & 115L University Physics I (4 credits)  
PHYS116 & 116L University Physics II (4 credits)  
MATH131 Calculus I (4 credits)  
MATH132 Calculus II (4 credits)  
PHYS306 Applied Physics lab (2 credits)  
PHYS307 Applied Physics (2 credits)  
PHYS308 & 308L Modern Physics/Lab (4 credits)  
PHYS310 Analytical Mechanics (3 credits)  
PHYS315 Advanced Laboratory I (1 credit)  
PHYS316 Advanced Laboratory II (1 credit)  
PHYS321 Mathematical Methods for Physics I (2 credits)  
PHYS341 Electricity and Magnetism (3 credits)  
PHYS405 Senior Seminar (1 credit)  
Electives: 6 credits in PHYS 311, 322, 342, 420, 497, 499, SCED396L (or 398L)

### **Biology teaching concentration (52-53)**

ENVI170 & 170L Earth Science (4 credits)  
PHYS105 & 105L General Physics I (4 credits)  
BIO101 & 101L Principles of Biology I (4 credits)  
BIO102 & 102L Principles of Biology II (4 credits)  
CHEM105 & 105L General Chemistry I (4 credits)  
MATH 241 Principles of Statistics (3 credits) or MATH 131 Calculus I (4 credits)  
BIO210/L (4) Fundamentals of Molecular Biology  
BIO330/L (4) General Physiology  
BIO350/L (4) Ecology and Evolution  
BIO374/L (4) Cellular and Microbial Biology  
BIO380/L (4) Genetics  
Electives (12): 12 credits in BIO 4@ or 4@L or 400-Biology courses or SCED398L

### **Earth and Space Sciences teaching concentration (44-46 credits)**

BIO101 & 101L Principles of Biology I (4 credits)  
ENVI110 & 110L Introduction to Environmental Science (4 credits)  
ENVI170 & 170L Earth Science (4 credits)  
CHEM105 & 105L General Chemistry I (4 credits)  
PHYS105 & 105L General Physics I (4 credits)  
MATH 131 Calculus I (4 credits) or ENVI240 (Quantitative Geography: 3 credits)  
ENVI 270 Earth History (3)  
ENVI 353 Global Climate Change (3 credits)  
ENVI 360 General Astronomy (3 credits)  
ENVI 383 Earth Materials (4 credits)  
ENVI 389 Intro to Field Geology (3 credits)

#### ***Electives (6 credits)***

ENVI350 Geomorphic Processes (3 credits)  
ENVI 361 Oceanography (3 credits)  
ENVI385 Structural Geology (3 credits)  
ENVI452 Quaternary Environments (3 credits)  
ENVI453 Climatology (3 credits)  
ENVI454 Intro to Hydrology (3 credits)  
ENVI456 Lakes and Wetlands (3 credits)  
ENVI457 Environmental Geology (3 credits)  
ENVI460 Conser. and Sustain. (3 credits)  
ENVI463 Soil Gen. and Class. (3 credits)  
ENVI471 Quat. Paleoecology (3 credits)

ENVI475 Stratigraph. & Sediment. (3 credits)  
ENVI479 Glob. Biogeochem. Cycle (3 credits)  
ENVI481 Geochemistry (3 credits)  
ENVI482 Volcanic Process. & Haz. (3 credits)  
ENVI483 Mineral Resources (3 credits)

### **Middle School Science teaching concentration (44-45 credits)**

BIO101 & 101L Principles of Biology I (4 credits)  
BIO102 & 102L Principles of Biology II (4 credits)  
ENVI110 & 110L Introduction to Environmental Science (4 credits)  
ENVI170 & 170L Earth Science (4 credits)  
CHEM105 & 105L General Chemistry I (4 credits)  
CHEM106 & 106L General Chemistry II (4 credits)  
PHYS105 & 105L General Physics I (4 credits)  
PHYS106 & 106L (4 credits) General Physics I  
MATH116 (4) or MATH112(2)/115(3) or MATH131 (4)

Electives (8 credits) in:

- Biology

BIO210/L (4) Fundamentals of Molecular Biology  
BIO330 & 330L General Physiology (4 credits)  
BIO350 & 350L Ecology and Evolution (4 credits)  
BIO374 & 374L Cellular and Microbial Biology (4 credits)  
BIO380 & 380L Genetics (4 credits)  
BIO 4@ courses

- Chemistry

CHEM321 & 321L Analytical Chemistry (4 credits)  
CHEM351 & 351L Organic Chemistry I (4 credits)  
CHEM352 & 352 Organic Chemistry II (4 credits)  
CHEM341 Inorganic Chemistry (3 credits)  
CHEM431 Biochemistry1 (3 credits)

- Physics

PHYS360 General Astronomy (3 credits)  
PHYS306 Applied Physics lab (2 credits)  
PHYS307 Applied Physics (2 credits)  
PHYS308 & 308L Modern Physics/Lab (4 credits)

- Earth Space Science

ENVI350 Geomorphic Processes (3 credits)

ENVI 353 Global Climate Change (3 credits)  
ENVI 360 General Astronomy (3 credits)  
ENVI 361 Oceanography (3 credits)  
ENVI 383 Earth Materials (4 credits)  
ENVI385 Structural Geology (3 credits)  
ENVI389 Intro to Field Geology (3 credits)  
ENVI451 Digital Heritage (3 credits)  
ENVI385 Structural Geology (3 credits)  
ENVI452 Quaternary Environments (3 credits)  
ENVI453 Climatology (3 credits)  
ENVI454 Intro to Hydrology (3 credits)  
ENVI456 Lakes and Wetlands (3 credits)  
ENVI457 Environmental Geology (3 credits)  
ENVI460 Conser. and Sustain. (3 credits)  
ENVI463 Soil Gen. and Class. (3 credits)  
ENVI 471 Quat. Paleoecology (3 credits)  
ENVI 475 Stratigrap. & Sediment. (3 credits)  
ENVI 479 Glob. Biogeochem. Cycle (3 credits)  
ENVI 481 Geochemistry (3 credits)  
ENVI 482 Volcanic Process. & Haz. (3 credits)  
ENVI 483 Mineral Resources (3 credits)