To complete the Science Education major, students must also complete the Biology, Chemistry or Physics Major, or complete the Earth Space Science Concentration.

**Earth Space Science Concentration 39 credits**

- ENVI 212 Geographic Information Systems 3 credits
- ENVI 115 Earth from Space: Contemporary Remote Sensing 3 credits
- ENVI 130 World Cultures and Environments 3 credits
- ENVI 211 Physical Geography 3 credits
- ENVI 270 Earth History 3 credits
- ENVI 353 Weather and Climate 3 credits
- ENVI 361 Oceanography 3 credits
- ENVI 452 Quaternary Environments 3 credits
- ENVI 460 Conservation and Sustainability of Natural Resources 3 credits
- ENVI 479 Global Biogeochemical Cycles 3 credits

Approved Electives Choose 6 Credits

- ENVI 376 - Dinosaurs, Quakes, and Volcanoes 3 credits
- ENVI 450 - Environmental Modeling and Mapping
- ENVI 455 - Groundwater Hydrology
- ENVI 456 - Lakes and Wetlands
- ENVI 463 - Soil Genesis and Classification
- ENVI 465 - Fundamentals of Tree Ring Research
- ENVI 471 - Quaternary Paleoecology

**Biology Major - 40 credits not taken in the Science Education core:** See also degree requirements listed in the Biology program section of the catalog.

**Biology Core (24 credits)**

- CHEM 351 - Organic Chemistry I 3 credits AND
- CHEM 351L - Organic Chemistry Laboratory I 1 credit
- CHEM 352 - Organic Chemistry II 3 credits AND
- CHEM 352L - Organic Chemistry Laboratory II 1 credit
- BIO 380 - Genetics 3 credits AND (F, Prerequisite: BIO102, MATH111)
- BIO 380L - Genetics Laboratory 1 credit
- BIO 350 - Ecology and Evolution 3 credits AND (F, Prerequisite: BIO102)
- BIO 350L - Laboratory in Ecology and Evolution 1 credit
- BIO 330 - General Physiology 3 credits AND (S, Prerequisite: BIO102, CHEM 352& 352L, PHYS105&105L)
- BIO 330L - G. Physiology Laboratory 1 credit
- BIO 374 - Cellular and Microbial Biology 3 credits AND (S, Prerequisite: CHEM 352& 352L)
- BIO 374L - Cell. & Micro. Laboratory 1 credit

**Biology Electives:** A minimum of 16 credits beyond the core curriculum selected from:

- Cell Biology: BIO 405 - Cellular Development 3 hours. BIO 406 - Cell and Tissue Culture, + Lab. BIO 408 - General Immunology, + lab. BIO 418 - Cellular and Molecular Biology II.

Biology of Organisms: BIO 424 - Vertebrate Zoology, with lab. BIO 425 - Herpetology, with lab. BIO 426 - Ornithology, with lab. BIO 428 - Mammalogy, with lab. BIO 427 - Plant Taxonomy, with lab.

Physiology: BIO 431 - General Endocrinology, BIO 434 - Introduction to Neurobiology (IUSM-TH), BIO 476 - Microbial Physiology

Botany: BIO 437 - Plant Physiology, with lab. BIO 445 - Plant Anatomy. BIO 447 - Comparative Morphology of Vascular Plants. BIO 427 - Plant Taxonomy, with lab (Spring, alternate years), BIO 465 - Fundamentals of Tree-Ring Research (EES, Dr. Speer)

Microbiology: BIO 475 - Mechanisms of Microbial Disease, BIO 476 - Microbial Physiology.

Clinical Lab Science, Nursing, Medicine: BIO 272 - Clinical Microscopy, BIO 272L - Laboratory. BIO 273 - Hematology, BIO 273L - Laboratory. BIO 371 - Applied Microbiology, BIO 371L - Laboratory. BIO 375 - Immunohematology + BIO 375L - Immunohematology Laboratory 1 hour. BIO 412 - Pathophysiology

Genetics: BIO 482 - Recombinant DNA, BIO 482L - Recombinant DNA Laboratory.

Statistics: BIO 485 - Introduction to Biometry

Primary Research: BIO 490 - Seminar in Life Sciences (Departmental Seminar, 1 hr/week)

Other: BIO 491 - Special Topics in Life Sciences 1-4 hours
“New” courses advertised by professors. Examples include: Sex, Brains and Hormones; Emerging Infectious Diseases; Molecular Ecology; many others.

Student Research:
Research Capstone Sequence:
BIO 497 - Current and Historical Issues in Science and Capstone Research Proposal Development 1 hour,
BIO 498 - Capstone Research 1 hour, BIO 499 - Research Capstone Presentations 1 hour

BIO 492 - Special Problems in Life Sciences 1-3 hours  Student Research Hours (other than capstone)

Biochemistry: CHEM 431 - Biochemistry I, CHEM 431L - Biochemistry Laboratory

Chemistry Major (Pre-Professional concentration)*– minimum of 39 credits not taken in Science Education Core: See also degree requirements listed in the Chemistry program section of the catalog.
(Pre-Professional concentration)

Math 132 (Calculus II; 4 credits; F, S, and Sum)
Chem 351 (Organic Chem I; 3 credits; F and Sum)
Chem 351L (Organic Chem I Lab; 1 credit; F and Sum)
Chem 352 (Organic Chem II; 3 credits; S and Sum)
Chem 352L (Organic Chem II Lab; 1 credit; S and Sum)
Chem 321 (Analytical Chem; 4 credits; S)
Chem 321L (Analytical Chem Lab; 0 credit; S)
Chem 461 (Physical Chem I; 4 credits; F)
Chem 461L (Physical Chem I Lab; 1 credit; F)
Chem 341 (Inorganic Chemistry; 3 credits; S)
Chem 431 (Biochemistry I; 3 credits; F)
Chem 431L (Biochemistry I Lab; 1 credit; F)
Chem 432 (Biochemistry II; 3 credits; S)
Chem 400 (Senior Seminar; 1 credit; S)

Advanced Electives (7 credits required): Choose approved advanced courses in chemistry or related areas (e.g., mathematics, physics, or biology); consult the Catalog or DARS for specific approved courses. A maximum of 4 credits of Chem 495 (Internship in Chemistry) or 499 (Introduction to Research) may be counted. Chem 330 and 399 cannot be used as advanced electives.

*We recommend the Pre-Professional concentration for Science Education. Other possible concentrations are offered in the chemistry program. Please see your chemistry advisor for further information.

**Physics Major (Chemical Physics concentration)***- minimum of 40 credits not taken in Science Education Core: See also degree requirements listed in the Physics program section of the catalog.
(Chemical physics concentration)

Math 132 (Calculus II; 4 credits; F, S, and Sum)
PHYS 215 - Modern Physics I 3 credits
PHYS 215L - Modern Physics I Laboratory 1 credits
PHYS 216 - Modern Physics II 3 credits
PHYS 216L - Modern Physics II Laboratory 1 credits
PHYS 310 - Analytical Mechanics 3 credits
PHYS 321 - Mathematical Methods for Physics I 2 credits
PHYS 322 - Mathematical Methods for Physics II 2 credits
PHYS 341 - Electricity and Magnetism 3 credits
PHYS 315 - Advanced Laboratory I 1 credits
PHYS 497 - Quantum Mechanics 3 credits
CHEM 321 - Analytical Chemistry 4 credits
CHEM 461 - Physical Chemistry I 4 credits
CHEM 461L - Experimental Physical Chemistry I 1 credits
CHEM 462 - Physical Chemistry II 4 credits
CHEM 462L - Experimental Physical Chemistry II 1 credits

* We recommend the Chemical Physics concentration for Science Education. Other possible concentrations are offered in the Physics program. Please see your chemistry advisor for further information.