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

To complete the Science Education major, students must also complete the Biology, Chemistry or Physics Major, or complete the concentration in Earth Space Science or Middle School Science.

Biology Major

40 credits not taken in the Science Education core: See degree requirements listed in the Biology program section of the catalog

http://catalog.indstate.edu/preview_program.php?catoid=5&poid=722&returnto=97

CHEM 351 & 351L-Organic Chemistry I (4 credits)
CHEM 352 & 352L-Organic Chemistry II (4 credits)
BIO 380 & 380L-Genetics (4 credits)
BIO 350 & 350L-Ecology and Evolution (4 credits)
BIO 330 & 330L-General Physiology (4 credits)
BIO 374 & 374 L-Cellular and Microbial Biology (4 credits)

Biology Electives **:**
A minimum of *16 credits* beyond the core curriculum selected from:
BIO 405, BIO 450, BIO 451, BIO 454, BIO 455, BIO 458/L, BIO 415, BIO 480, BIO 4XX,
BIO 424/L, BIO 425/L, BIO 426/L, BIO 428/L, BIO 427/L, BIO 431, BIO 434, BIO 476,
BIO 437/L, BIO 445, BIO 447, BIO 427/L, BIO 465, BIO 475, BIO476, BIO 272/L, BIO 273/L, BIO 371/L,
BIO 375/L, BIO 412 BIO 482/L, BIO 485, BIO 490, BIO 491, BIO 497, BIO 499,
BIO 492, CHEM 431/L

Chemistry Major*

BA in Chemistry (recommend): minimum of 29 credits not taken in Science Education Core

MATH 132- Calculus II (4 credits)
CHEM 351 & 351L-Organic Chemistry I (4 credits)
CHEM 352 & 352L-Organic Chemistry II (4 credits)
CHEM 321 & 321L-Analytical Chemistry (4 credits)
CHEM 461 & 461L-Physical Chemistry I (5 credits)
CHEM 341-Inorganic Chemistry (3 credits)
CHEM 431 & 431L-Biochemistry I (4 credits)
CHEM 405-Senior Seminar (1 credit)
Advanced Electives (3 credit): substituted by SCED398L for science education majors

BS in Chemistry

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

http://catalog.indstate.edu/preview_program.php?catoid=13&poid=1796&returnto=289
http://www.indstate.edu/chem_phys/Preprof_concentration.pdf (Pre-Professional concentration)

MATH 132- Calculus II (4 credits)
CHEM 351 & 351L-Organic Chemistry I (4 credits)
CHEM 352 & 352L-Organic Chemistry II (4 credits)
CHEM 321 & 321L-Analytical Chemistry (4 credits)
CHEM 461 & 461L-Physical Chemistry I (5 credits)
CHEM 341-Inorganic Chemistry (3 credits)
CHEM 431 & 431L-Biochemistry I (4 credits)
CHEM 432-Biochemistry II (3 credits)
CHEM 405-Senior Seminar (1 credit)

Chemistry 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 **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*

BA in Physics (recommend): minimum of 28 credits not taken in Science Education Core

MATH 132-Calculus II (4 credits)
PHYS 215 & 215L - Modern Physics I (4 credits)
PHYS 216 & 216L- Modern Physics II (4 credits)
PHYS 310 - Analytical Mechanics (3 credits)
PHYS 321 - Mathematical Methods for Physics I (2 credits)
PHYS 341 - Electricity and Magnetism (3 credits)
PHYS 315 - Advanced Laboratory I (1 credit)
PHYS 316 - Advanced Laboratory II (1 credit)
PHYS 405 – Senior Seminar (1 credit)
PHYS Elective 1 (3 credit)
PHYS Elective 2 (3 credit): can be substituted by SCED398L for Science Education majors

BS in Physics

Chemical physics concentration- minimum of 37 credits not taken in Science Education Core: See degree requirements listed in the Physics program section of the catalog.

http://catalog.indstate.edu/preview_program.php?catoid=13&poid=1920&returnto=289

http://www.indstate.edu/chem_phys/Chemical%20Physics%20Concentration%20Curriculum%20Guide.pdf (Chemical physics concentration)

MATH 132-Calculus II (4 credits)
PHYS 215 & 215L - Modern Physics I (4 credits)
PHYS 216 & 216L- Modern Physics II (4 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 credit)
PHYS 316 - Advanced Laboratory II (1 credit)
PHYS 497 - Quantum Mechanics (3 credits)
CHEM 321 & 321L - Analytical Chemistry (4 credits)
CHEM 461 & 461L - Physical Chemistry I (5 credits)
CHEM 462 & 462L - Physical Chemistry II (5 credits)

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

Earth Space Science Concentration

24 credits

Requirements (18 credits)
ENVI 270 Earth History (3)
ENVI 353 Weather and Climate (3)
ENVI 360 General Astronomy (3)
ENVI 361 Oceanography (3)
ENVI 380 Mineralogy (3)
ENVI 382 Petrology (3)

Electives (6 credits)
ENVI 342 Intro Geographic Info System (3), ENVI 350 Geomorphic Processes (3)
ENVI 376 Dinosaurs, Quakes, and Volcanoes (3), ENVI 385 Structural Geology (3)
ENVI 454 Intro to Hydrology, ENVI 455 Groundwater Hydrology (3)
ENVI 456 Lakes and Wetlands (3), ENVI 457 Environmental Geology (3)
ENVI 458 Medical Geology (3)
ENVI 460 Conservation and Sustainability of Natural Resources(3)
ENVI 463 Soil Genesis and Classification (3), ENVI 470 Paleontology and Geobiology (3)

ENVI 471 Quaternary Paleoecology (3), ENVI 475 Stratigraphy & Sedimentation (3)
ENVI 479 Global Biogeochemical Cycles (3), ENVI 481 Geochemistry (3)
ENVI 482 Volcanic Processes and Hazards (3), ENVI 483 Mineral Resources (3)

Middle School Science Concentration

Choose **8 credits** minimum

Biology
- BIO 330 & 330L- General Physiology (4 credits)
- BIO 350 & 350L -Ecology and Evolution (4 credits)
- BIO 374 & 374L -Cellular and Microbial Biology (4 credits)
- BIO 380 & 380L-Genetics (4 credits)

Chemistry
- CHEM 321 & 321L-Analytical Chemistry (4 credits)
- CHEM 351 & 351L-Organic Chemistry I (4 credits)
- CHEM 352 & 352L-Organic Chemistry II (4 credits)
- CHEM 341-Inorganic Chemistry (3 credits)

Earth Space Science
- ENVI 353-Weather and climate (3 credits)
- ENVI 361-Oceanography (3 credits)
- ENVI 376/376L-Dinosaurs, Quakes, Volcanoes (3 credits) [Upper Division Elective]
- ENVI 460-Conservation and Sustainability of Natural Resources (3 credits) [Upper Division Elective]

Physics
- PHYS360-General astronomy (3 credits) [Upper Division Elective]