

## Broad Science Education 7-12 Effective 2015-2016 academic year

**I. ACHIEVEMENT CENTERED EDUCATION (ACE) (15 hrs)**

All UNL students are required to complete a minimum of 3 hours of approved course work in each of the 10 designated ACE areas.

ACE #1 *Written Texts Incorporating Research & Knowledge Skills*  
ENGL 150, 151, or 254 \_\_\_\_\_ (3 hrs) \_\_\_\_\_

ACE #2 *Communication Skills*  
COMM 109, 209, 210, or 286 \_\_\_\_\_ (3 hrs) \_\_\_\_\_

ACE #3 *Mathematical, Computational, Statistical, or Formal Reasoning Skills*  
MATH 106, STAT 218, or EDPS 459 \_\_\_\_\_ (3 hrs) \_\_\_\_\_

ACE #4 *Study of Scientific Methods & Knowledge of Natural & Physical World*  
LIFE 120/120L \_\_\_\_\_ (3 hrs)

ACE #5 *Study of Humanities*  
(Any) \_\_\_\_\_ (3 hrs) \_\_\_\_\_

ACE #6 *Study of Social Sciences*  
EDPS 251 \_\_\_\_\_ (3 hrs)

ACE #7 *Study of the Arts to Understand Their Context & Significance*  
(Any) \_\_\_\_\_ (3 hrs) \_\_\_\_\_

ACE #8 *Ethical Principles, Civics, Stewardship & Their Importance to Society*  
TEAC 331 \_\_\_\_\_ (3 hrs)

ACE #9 *Global Awareness, Knowledge of Human Diversity through Analysis of an Issue*  
TEAC 330 \_\_\_\_\_ (3 hrs)

ACE #10 *Integration of Abilities, Capacities in a Creative or Scholarly Product*  
TEAC 403B \_\_\_\_\_ (3 hrs)

**Additional ACE course work**

Select 4 additional courses from ACE Outcomes 1-10

EDPS 457 \_\_\_\_\_ (3 hrs)   
 GEOL 101 \_\_\_\_\_ (4 hrs)   
 LIFE 121 \_\_\_\_\_ (4 hrs)   
 CHEM 110 \_\_\_\_\_ (4 hrs)

Acceptance into the Science Teacher Education Program is required before enrollment in the Professional Education courses. 80% of the endorsement courses must be completed prior to enrolling in TEAC 451V. The professional education sequence begins spring semester, continues in the fall semester, and is followed by a semester of student teaching.

**II. PRE-PROFESSIONAL EDUCATION (13 hrs)**

*No grade lower than "C"*

*All courses must be for a grade (not Pass/No Pass) with the exception of EPDS 297.*

*TEAC 331 & EDPS 251 must average a 2.5 GPA*

TEAC 331 School & Society \_\_\_\_\_ (3 hrs) \_\_\_\_\_

EDPS 251 Adolescent Development for Ed \_\_\_\_\_ (3 hrs) \_\_\_\_\_

EDPS 297 Practicum (take with EDPS 251) \_\_\_\_\_ (1 hr) \_\_\_\_\_

TEAC 330 Multicultural Ed \_\_\_\_\_ (3 hrs) \_\_\_\_\_

TEAC 259 Instructional Technology \_\_\_\_\_ (3 hrs) \_\_\_\_\_

**Professional Education Courses (27 hrs)**

*All grades must be a minimum of "C+" or above*

**Methods**

TEAC 451V Teaching Principles \_\_\_\_\_ (3 hrs) \_\_\_\_\_

TEAC 452V Curriculum Principles \_\_\_\_\_ (3 hrs) \_\_\_\_\_

TEAC 397V Practicum \_\_\_\_\_ (3 hrs) \_\_\_\_\_

EDPS 457 Learning and Motivation \_\_\_\_\_ (3 hrs) \_\_\_\_\_

SPED 401B Mainstreaming \_\_\_\_\_ (3 hrs) \_\_\_\_\_

**Student Teaching**

TEAC 497V Student Teaching \_\_\_\_\_ (9 hrs) \_\_\_\_\_

TEAC 403B Student Teaching Seminar (ACE 10) \_\_\_\_\_ (3 hrs) \_\_\_\_\_

**Electives (0-5 hrs)**

\_\_\_\_\_ (3 hrs) \_\_\_\_\_

\_\_\_\_\_ (3 hrs) \_\_\_\_\_

**III. ENDORSEMENT (60 hrs)**

*No grade lower than "C"*

Select one of the science areas below and take a minimum of 24 credits as listed below. In each of the other three science areas, take a minimum of 12 credit hours.

A minimum of 60 credit hours of laboratory-based courses in science (biology, chemistry, earth and space science, and physics) is required. At least 24 credit hours must be in one of the four areas listed as the main core of the endorsement and 36 credit hours of laboratory-based courses must be distributed evenly among the other three ancillary science areas (i.e. a minimum of 12 credits in each of the ancillary sciences.)



**BIOLOGY (24 hrs)**

LIFE 120/120L Fundamentals of Biology I w/lab (4 hrs) \_\_\_\_\_  
 LIFE 121/121L Fundamentals of Biology II w/lab (4 hrs) \_\_\_\_\_

**Select one of the following choices:** \_\_\_\_\_ (4 hrs) \_\_\_\_\_

BIOS 112/112L Intro to Zoology w/lab \_\_\_\_\_  
 ASCI 100 Fundamentals of Animal Biology and Industry \_\_\_\_\_  
 BIOS 109 General Botany \_\_\_\_\_  
 AGRO 131/132 Plant Science w/lab (HORT 131/133) \_\_\_\_\_

**Select one of the following choices:** \_\_\_\_\_ (4 hrs) \_\_\_\_\_

BIOS 206 General Genetics \_\_\_\_\_  
 AGRO 315 Genetics \_\_\_\_\_

**Select one of the following choices:** \_\_\_\_\_ (3-4 hrs) \_\_\_\_\_

BIOS 220/222 Principles of Ecology (NRES 220/222) \_\_\_\_\_  
 BIOS 207 Ecology and evolution \_\_\_\_\_  
 PLPT 270 Biological Invaders (NRES/AGRO/HORT) \_\_\_\_\_

**Select at least one of the following:** \_\_\_\_\_ (4-5 hrs) \_\_\_\_\_

BIOS 115 Insect Biology (ENTO 115) \_\_\_\_\_  
 BIOS 213/213L Human Physiology w/lab \_\_\_\_\_  
 BIOS 312/313 Microbiology w/lab \_\_\_\_\_  
 BIOS 205 Genetics, Molecular and Cellular Biology Lab \_\_\_\_\_  
 NRES 281 Introduction to Water Science \_\_\_\_\_  
 AGRI 115 Biotechnology: Food Health and Environment \_\_\_\_\_

**BIOLOGY (12 hrs)****Option A**

LIFE 120/120L Fundamentals of Biology I w/lab (4 hrs) \_\_\_\_\_  
 LIFE 121/121L Fundamentals of Biology II w/lab (4 hrs) \_\_\_\_\_

BIOS 207 Ecology and Evolution **OR** \_\_\_\_\_  
 BIOS 220/222 Principles of Ecology (NRES 220/222) (4 hrs) \_\_\_\_\_

**Option B**

LIFE 120/120L Fundamentals of Biology I w/lab (4 hrs) \_\_\_\_\_  
 LIFE 121/121L Fundamentals of Biology II w/lab (4 hrs) \_\_\_\_\_

PLPT 270 Biological Invaders (NRES/AGRO/HORT) (3 hrs) \_\_\_\_\_

**Select one of the following:** \_\_\_\_\_

AGRI 115 Biotechnology: Food Health and Environment **OR** \_\_\_\_\_  
 BIOS 115 Insect Biology (ENTO 115) **OR** \_\_\_\_\_  
 BIOS 205 Genetics, Molecular and Cellular Biology Lab **OR** \_\_\_\_\_  
 BIOS 213/213L Human Physiology w/lab **OR** \_\_\_\_\_  
 BIOS 312/313 Microbiology w/lab **OR** \_\_\_\_\_  
 NRES 281 Introduction to Water Science (2-5 hrs) \_\_\_\_\_

**CHEMISTRY (24 hrs)**

CHEM 109 General Chemistry I (4 hrs) \_\_\_\_\_  
 CHEM 110 General Chemistry II (4 hrs) \_\_\_\_\_  
 CHEM 221 Elementary Quantitative Analysis (4 hrs) \_\_\_\_\_

**Select one of the following:** \_\_\_\_\_ (4 hrs) \_\_\_\_\_

CHEM 251/253 Organic Chemistry w/lab **OR** \_\_\_\_\_  
 CHEM 255/257 Biologic Organic Chemistry w/lab \_\_\_\_\_

CHEM 421/423 Analytical Chemistry w/lab (5 hrs) \_\_\_\_\_

**Select one of the following:** \_\_\_\_\_ (3-4 hrs) \_\_\_\_\_

CHEM 471 Physical Chemistry **OR** \_\_\_\_\_  
 CHEM 481 Physical Chemistry I **OR** \_\_\_\_\_  
 CHEM 131 Science of Food \_\_\_\_\_

**CHEMISTRY (12 hrs)**

CHEM 109 General Chemistry I (4 hrs) \_\_\_\_\_  
 CHEM 110 General Chemistry II (4 hrs) \_\_\_\_\_

CHEM 251/253 Organic Chemistry w/lab **OR** \_\_\_\_\_  
 CHEM 255/257 Biologic Organic Chemistry w/lab (4 hrs) \_\_\_\_\_

**EARTH & SPACE SCIENCE (24 hrs)**

GEOL 101 Physical Geology (4 hrs) \_\_\_\_\_  
 GEOL 103 Historical Geology (4 hrs) \_\_\_\_\_  
 GEOL 109 Oceanography (3 hrs) \_\_\_\_\_  
 METR 100 Weather and Climate (4 hrs) \_\_\_\_\_

**Select one of the following:** \_\_\_\_\_ (3-4 hrs) \_\_\_\_\_

ASTR 103 Descriptive Astronomy \_\_\_\_\_  
 ASTR 204/224 Astrophysics w/lab \_\_\_\_\_

**Select one of the following:** \_\_\_\_\_ (3-4 hrs) \_\_\_\_\_

GEOL 106 Environmental Geology \_\_\_\_\_  
 NRES 108 Earth's Energy Resources \_\_\_\_\_  
 SOIL 153 Soil Resources \_\_\_\_\_

**Select one of the following:** \_\_\_\_\_ (3-4 hrs) \_\_\_\_\_

GEOL 110 Geological Natural Hazards \_\_\_\_\_  
 GEOL 115 Earth's Energy Resources \_\_\_\_\_  
 GEOL 160 Geoscience Fundamentals in the Field \_\_\_\_\_  
 GEOL 210 Minerals, Rocks & Ores \_\_\_\_\_  
 GEOL 211 Sedimentology and Stratigraphy \_\_\_\_\_

**EARTH & SPACE SCIENCE (12 hrs)****Option A**

GEOL 101 Physical Geology (4 hrs) \_\_\_\_\_  
 METR 100 Weather and Climate (4 hrs) \_\_\_\_\_  
 ASTR 204/224 Astrophysics w/lab (4 hrs) \_\_\_\_\_

**Option B**

GEOL 101 Physical Geology (4 hrs) \_\_\_\_\_  
 METR 100 Weather and Climate (4 hrs) \_\_\_\_\_  
 ASTR 103 Descriptive Astronomy (3 hrs) \_\_\_\_\_

**Select one of the following:** \_\_\_\_\_

GEOL 106 Environmental Geology **OR** \_\_\_\_\_  
 GEOL 110 Geological Natural Hazards **OR** \_\_\_\_\_  
 GEOL 115 Earth's Energy Resources **OR** \_\_\_\_\_  
 GEOL 210 Minerals, Rocks & Ores **OR** \_\_\_\_\_  
 GEOL 211 Sedimentology and Stratigraphy **OR** \_\_\_\_\_  
 NRES 108 Earth's Energy Resources **OR** \_\_\_\_\_  
 SOIL 153 Soil Resources (3-4 hrs) \_\_\_\_\_

**PHYSICS (24 hrs)**

**Select one of the following sequences:** \_\_\_\_\_ (10 hrs) \_\_\_\_\_

A. Non-calculus based physics

PHYS 141 Elementary General Physics I \_\_\_\_\_  
 PHYS142 Elementary General Physics II \_\_\_\_\_

B. Calculus based physics

PHYS 211/221 General Physics I \_\_\_\_\_  
 PHYS 212/222 General Physics II \_\_\_\_\_

Note: Students must take sequence B if physics is to be the main core of the endorsement. Math 106, 107, and 208 are the pre-requisites for sequence B.

ASTR 204/224 Astrophysics w/lab (4 hrs) \_\_\_\_\_  
 PHYS 115 Descriptive Physics (3 hrs) \_\_\_\_\_  
 PHYS 201 Modern Topics in Physics and Astronomy(1 hr) \_\_\_\_\_  
 PHYS 231 Electrical and Electronic Circuits (3 hrs) \_\_\_\_\_  
 PHYS 311 Mechanics (3 hrs) \_\_\_\_\_

**PHYSICS (12 hrs)**

PHYS 141 Elementary General Physics I (5 hrs) \_\_\_\_\_  
 PHYS 142 Elementary General Physics I (5 hrs) \_\_\_\_\_

**OR** \_\_\_\_\_  
 PHYS 211/221 General Physics I (5 hrs) \_\_\_\_\_  
 PHYS 212/222 General Physics II (5 hrs) \_\_\_\_\_

PHYS 115 Descriptive Physics (3 hrs) \_\_\_\_\_