ADVISEMENT FOR SCIENCE COURSEWORK

Certification in science education is a broad field, high school science teacher preparation for teaching biology, chemistry, earth/space science, general science, physical science and/or physics. Students complete 54 undergraduate and 5-6 graduate credit hours in the natural sciences. Students are required to complete their undergraduate science coursework in four science disciplines with at least 10 hours that are upper division: a) biological sciences (9 hours) and anatomy/physiology (4-5 hours); b) chemistry (10 hours); c) physics (8 hours); and d) earth/space sciences (8 hours). Science electives (14-15 hours) and the 5-6 graduate credit hours in science are selected from subject area(s) which they intend to teach. In other words, science education faculty advises students in their course selections for completing certification which is to be in one or two subjects. Listed below are the recommended courses for biology, chemistry, physics and earth/space science.

Edmund A. Marek and Jon E. Pedersen, Co-Chairs
Science Certification Committee, Spring 2004

BIOLOGY

All science certification students must take the introductory botany and zoology courses and a course in anatomy/physiology. Then certification students are advised during their selections of science electives. For example, if a student chooses biology as the science discipline for the 14-15 hours of undergraduate science, the following courses are advised.

- BOT 2404 Ecology and Environmental Quality, prerequisite: Sophomore standing (or ZOO G3403 Principles of Ecology, prerequisite: 8 hours of zoology or BOT G3453 Principles of Plant Ecology, prerequisite: BOT 3534 or equivalent)
- ZOO G3333 Genetics, prerequisite: 8 hours of zoology or 8 hours of botany, or 5 hours of zoology or botany and permission (Cross listed with BOT 3333)
- BOT 3113 Cell Biology, prerequisite: BOT 1114 or ZOO 1114, and CHEM 3013 or 3053 (Cross listed with MBIO 3113 and ZOO 3113)
- ZOO 2013 Evolution (includes human heredity,) prerequisite: ZOO 1124 or BIOL 1134
- ZOO 3083 Animal Behavior, prerequisite: 8 hours of zoology, including 1114 and 1121 or permission of instructor (cross listed with PSY 3083)
- Note: Courses are also offered at the University of Oklahoma's Biological Station (OUBS) at Lake Texhoma during summers and intercessions. Visit OUBS's web site or pick up a brochure for course listings.

For the graduate component of science certification, graduate level, independent study courses in botany/microbiology and/or zoology are recommended. The Independent Study format is recommended so that science education students can have opportunities to work in scientists' laboratories.

CHEMISTRY

All science certification students must take CHEM 1315 General Chemistry (prerequisite: MATH 1503 or 1643, or a Math ACT equal to or greater than 23,) and CHEM 1415 General Chemistry (prerequisite CHEM 1315 with minimum grade of C or a satisfactory score on the chemistry placement examination.) Then certification students are advised during their selections of science electives. For example, if a student chooses chemistry as the science discipline for the 14-15 hours of undergraduate science, the following courses are advised.

- CHEM 3013 Organic Chemistry, prerequisite: CHEM 1415 or 1425

- CHEM 3012 Organic Chemistry Laboratory, prerequisite: CHEM 3013 or concurrent enrollment
- CHEM 3214 Quantitative Analysis, prerequisites: CHEM 1415 or 1425 and MATH 1523 or 1623
- CHEM G3453 Basic Physical Chemistry, prerequisites CHEM 1415 or 1425, MATH 2423 and PHYS 2524 or 2424
- CHEM G3653 Introduction to Biochemistry, prerequisites CHEM 3013 or 3053

For the graduate component of science certification, graduate level, Independent Study courses in chemistry are required. The Independent Study format is recommended so that science education students can have opportunities to work in scientists' laboratories.

PHYSICS

All science certification students must take PHYS 2414 General Physics for Life Science Oriented Majors (prerequisites: MATH 1523 or 1743, not open to students with credit in PHYS 1202 or 2514) and PHYS 2424 General Physics for Life Science Oriented Majors (prerequisites: PHYS2414, not open to students with credit in PHYS 1215 or 2524.) Then certification students are advised during their selections of science electives. For example, if a student chooses physics as the science discipline for the 14-15 hours of undergraduate science, the following courses are advised.

- PHYS 2514 General Physics for Engineering and Science Majors, prerequisites: MATH 1823, not open to students with credit in PHYS 1205
- PHYS 2524 General Physics for Engineering and Science Majors, prerequisites: CHEM 2514, MATH 2423, not open to students with credit in PHYS 1214
- PHYS G3223 Modern Physics for Engineers, prerequisites: MATH 3113 or equivalent
- PHYS 4990 Independent Study, prerequisites: 3 courses in general area to be studied and permission of instructor and department
- ASTR 1504 General Astronomy
- PHYS G5970 Seminar-Selected topics in Modern Physics, prerequisite: permission

For the graduate component of science certification, graduate level, Independent Study courses in physics are recommended. The Independent Study format is recommended so that science education students can have opportunities to work in scientists' laboratories.

EARTH/SPACE SCIENCE

All science certification students must take GEOL 1114 Physical Geology for Science and Engineering Majors and METR 1014 Introduction to Weather and Climate. Then certification students are advised during their selections of science electives. For example, if a student chooses earth/space science as the science discipline for the 14-15 hours of undergraduate science, the following courses are advised.

- ASTR 1504 General Astronomy
- AGSC/GEOL 2014 The Earth System
- METR 2603 Severe and Unusual Weather
- GPHY 1104 Adventures in Geophysics

For the graduate component of science certification, graduate level, independent study courses in earth/space science are recommended. The Independent Study format is recommended so that science education students can have opportunities to work in scientists' laboratories.