

COLLEGE OF EDUCATION AND ALLIED PROFESSIONS

SCHOOL OF TEACHING AND LEARNING

SCIENCE EDUCATION, B.S.ED.

CONCENTRATIONS: *Biology, Chemistry, Earth Science, Physics*

DEGREE PROGRAM STUDENT LEARNING OUTCOMES

Educational Goal #1: As informed, effective, and innovative inquiry-based practitioners and leaders in schools and communities, secondary science education students will be able to synthesize and apply their pedagogical content knowledge across the four areas of comprehensive science and demonstrate a depth of knowledge in their concentration.

Educational Goal #1 Student Learning Outcomes:

Students will/will have:

1. An understanding of the principles of the four areas of comprehensive science; biology, chemistry, physics and earth science together with the foundational mathematical skills to explore how they are all interconnected.
2. Be well-informed and competent facilitators of their students' learning with a sound depth and breadth of pedagogical content knowledge including the nature and philosophy of science.
3. Become familiar with federal and state science education and professional teaching standards.
4. Created, taught, and assessed successful unit and lesson plans.
5. Become familiar with, and competent in, inquiry-learning skills.
6. The ability to perform basic student-centered investigations in their concentration areas.
7. The ability to effectively communicate scientific and educational information, both orally and in writing.
8. The ability to facilitate collaborative learning, lead a class discussion, teach problem solving, and assess their students' knowledge in multiple ways.
9. A practical understanding of laboratory safety and bioethical issues.
10. Be engaged with the local community through practica and teaching internship experiences.

Educational Goal #2: Secondary science education students will develop sets of quantitative skills, communication skills, and technical skills that will enable them to be successful contributors to science education and society.

Educational Goal #2 Student Learning Outcomes:

Students will demonstrate competence in the following skills:

11. Communication Skills

- a. Present data in written and oral format appropriate for science education and discipline specific journals.
- b. Write in a logical, cohesive, and concise manner as demonstrated through creating lesson plans, proposals and scientific papers.
- c. Prepare, deliver, and defend technical/scientific presentations, including graphical interpretations.

12. Quantitative Skills

- a. Perform basic math skills used in algebra and calculus.
- b. Calculate, use and interpret basic descriptive statistics.
- c. Calculate, use and interpret basic statistical tests.
- d. Design a basic research project or data collection scheme and to determine the statistical analyses required to interpret their data.

13. Technology Skills

- a. Use spreadsheets for basic data management.
- b. Use presentation software in the classroom.
- c. Use science/library databases effectively.
- d. Use laboratory and field equipment in all four concentration areas.

Educational Goal #3: Students can conduct scientific investigations.

Educational Goal #3 Student Learning Outcomes:

Students will be able to:

- 14. Plan and implement basic investigations, both of a general nature and of a type suitable for their area of concentration.
- 15. Perform literature searches and reviews.
- 16. Make accurate and precise measurements.
- 17. Operate instruments and equipment particular to their area of interest.
- 18. Successfully complete an advanced capstone research project.

Education Goal #4: Students will have skills to develop their career path.

Educational Goal #4 Student Learning Outcomes:

Students will demonstrate an understanding of:

- 19. Academic progress and performance necessary to achieve their stated goals
- 20. How to become a member of a science teachers' organization, network professionally and find information on teaching positions and professional development in and out of state.