Student Learning Outcomes Library

Office of Assessment & Accreditation
Indiana State University

B.S. in Science Education

Fall 2016

	Outcome	F.S.
I. Foundations of Science Teaching	1.1 Nature of Science Teacher candidates of science engage students effectively in studies of the history, philosophy, and practice of science. They enable students to distinguish science from nonscience, understand the evolution and practice of science as a human endeavor, and critically analyze assertions made in the name of science. To show they are prepared to teach the nature of science, teacher candidates of science must demonstrate that they: 1.1 (a) understand the philosophical tenets, assumptions, goals, and values : understand the philosophical tenets, assumptions, goals, and values that distinguish science from technology and from other ways of knowing the world 1.1 (b) engage students in studies of the nature of science :engage students successfully in studies of the nature of science including, when possible, the critical analysis of false or doubtful assertions made in the name of science	FS1 FS2 FS6
	1.2 Safety and Welfare Teacher candidates of science organize safe and effective learning environments that promote the success of students and the welfare of all living things. They require and promote knowledge and respect for safety, and oversee the welfare of all living things used in the classroom or found in the field. To show that they are prepared, teachers of science must demonstrate that they: 1.2 (a) understand the legal and ethical responsibilities : understand the legal and ethical responsibilities of science teachers for the welfare of their students, the proper treatment of animals, and the maintenance and disposal of materials 1.2 (b) know and practice proper techniques for the use of materials : know and practice safe and proper techniques for the preparation, storage, dispensing, supervision, and disposal of all materials used in science instruction 1.2 (c) know and follow safety procedures : know and follow emergency procedures, maintain safety equipment, and ensure safety procedures appropriate for the activities and the abilities of students	FS3 FS5 FS9
	1.3 Professional Growth Teacher candidates of science strive continuously to grow and change, personally and professionally, to meet the diverse needs of their students, school, community, and profession. They have a desire and disposition for growth and betterment. To	FS2 FS3 FS8 FS10

	show their disposition for growth, teacher candidates of science must demonstrate that they: 1.3 (a) reflect upon teaching : reflect constantly upon their teaching and identify ways and means through which they may grow professionally 1.3 (b) improve teaching and facilitate professional growth : use information from students, supervisors, colleagues and others to improve their teaching and facilitate their professional growth	
II. Science Curriculum	2.1 Curriculum Teacher candidates of science plan and implement an active, coherent, and effective curriculum that is consistent with the goals and recommendations of the national and state science standards. They begin with the end in mind and effectively incorporate contemporary practices and resources into their planning and teaching. To show that they are prepared to plan and implement an effective science curriculum, teacher candidates of science must demonstrate that they: 2.1 (a) understand curricular recommendations **:** understand the curricular recommendations of the national and state science standards, and can identify, access, and/or create resources and activities for science education that are consistent with the standards 2.1 (b) plan units of study **:** plan and implement internally consistent units of study that address the diverse goals of the national and state science standards and the needs and abilities of students.	FS1 FS2 FS3
	2.2 Issues Teacher candidates of science recognize that informed citizens must be prepared to make decisions and take action on contemporary science- and technology - related issues of interest to the general society. They require students to conduct inquiries into the factual basis of such issues and to assess possible actions and outcomes based upon their goals and values. To show that they are prepared to engage students in studies of issues related to science, teacher candidates of science must demonstrate that they: 2.2 (a) understand socially important issues related to science : understand socially important issues related to science and technology in their field of licensure, as well as processes used to analyze and make decisions on such issues 2.2 (b) engage students in the analysis of problems : engage students successfully in the analysis of problems, including considerations of risks, costs, and benefits of alternative solutions; relating these to the knowledge, goals and values of the students.	FS5 FS6 FS7 HS10
	2.3 Science in the Community Teacher candidates of science relate their discipline to their local and regional communities, involving stakeholders and using the individual, institutional, and natural resources of the community in their teaching. They actively engage students in science - related studies or activities related to locally important issues. To show that they are prepared to relate science to the community, teacher candidates of science must demonstrate that they: 2.3 (a) relate science to the community	FS1 FS2 FS5 FS7

	: identify ways to relate science to the community, involve stakeholders, and use community resources to promote the learning of science 2.3 (b) involve students in activities that relate science to the community : involve students successfully in activities that relate science to resources and stakeholders in the community or to the resolution of issues important to the community	
III. Instructional Strategies for Teaching Science	3.1 Inquiry Teacher candidates of science engage students both in studies of various methods of scientific inquiry and in active learning through scientific inquiry. They encourage students, individually and collaboratively, to observe, ask questions, design inquiries, and collect and interpret data in order to develop concepts and relationships from empirical experiences. To show that they are prepared to teach through inquiry, teachers of science must demonstrate that they: 3.1 (a) understand the methods of inquiry : understand the processes, tenets, and assumptions of multiple methods of inquiry leading to scientific knowledge 3.1 (b) engage students in inquiries : engage students successfully in developmentally appropriate inquiries that require them to develop concepts and relationships from their observations, data, and inferences in a scientific manner.	FS1 FS2 FS3 FS10
	3.2 General Skills of Teaching Teacher candidates of science create a community of diverse learners who construct meaning from their science experiences and possess a disposition for further exploration and learning. They use, and can justify, a variety of classroom arrangements, groupings, actions, strategies, and methodologies. To show that they are prepared to create a community of diverse learners, teacher candidates of science must demonstrate that they: 3.2 (a) vary teaching methods : vary their teaching actions, strategies, and methods to promote the development of multiple student skills and levels of understanding; 3.2 (b) promote the learning of science by diverse students : successfully promote the learning of science by students with different abilities, needs, interests, and backgrounds; 3.2 (C) use technological tools : successfully use technological tools, including but not limited to computer technology, to access resources, collect and process data, and facilitate the learning of science	FS3 FS8
IV. Student Learning and Assessment	4.1 Student Learning For effective teaching, teacher candidates of science need to know how students' different developmental levels or learning styles vary in their approaches to learning related to specific topic learning. In addition, teacher candidates should know both the prior understanding and difficulties that students of a given age bring with them to the study of particular topics. To show that they have the knowledge of student learning, teacher candidates of science must demonstrate that they: 4.1 (a) understand student prior knowledge : understand and build effectively upon the prior beliefs, knowledge, experiences, and interests of students	FS2 FS3 FS6

	4.1 (b) reflect on teaching in terms of student learning : reflect on and critically analyze their teaching to address how their unit teaching effects student learning	
	4.2 Assessment Teacher candidates of science construct and use effective assessment strategies to determine the backgrounds and achievements of learners and facilitate their intellectual, social, and personal development. They assess students fairly and equitably, and require that students engage in ongoing self-assessment. To show that they are prepared to use assessment effectively, teacher candidates of science must demonstrate that they: 4.2 (a) use multiple assessment tools and strategies : use multiple assessment tools and strategies to achieve important goals for instruction that are aligned with methods of instruction and the needs of students 4.2 (b) use assessment results to guide instruction : use the results of multiple assessments to guide and modify instruction, the classroom environment, or the assessment process	FS2 FS4

Foundational Studies Learning Goals

FS1. Solve problems.
FS2. Evaluate ideas.
FS3. Learn and apply knowledge and skills.
FS4. Demonstrate appreciation for the arts.
FS5. Embrace civic duty.
FS6. Understand diversity.
FS7. Act as a global citizen.
FS8. Behave ethically.
FS9. Cultivate wellness.
FS10. Communicate effectively.

Graduate Student Learning Goals

G1. Demonstrate professional communication proficiencies.
G2. Engage in and meaningfully contribute to diverse and complex communities and professional environments.
G3. Recognize and act on professional and ethical challenges that arise in their field or discipline.
G4. Achieve mastery of the knowledge required in their discipline or profession.
G5. Achieve mastery of the skills (including using appropriate tools) required in their discipline or profession.