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2021 BS Biology

Major-NH-BIOS-Biology (BS)

2021

Completed

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Institutional Mission

Arkansas Tech University is dedicated to student success, access, and excellence as a responsive campus community providing opportunities for progressive intellectual development and civic engagement. Embracing and expanding upon its technological traditions, Tech inspires and empowers members of the community to achieve their goals while striving for the betterment of Arkansas, the nation, and the world.

Program Mission

The Department of Biological Sciences promotes academic excellence and varied instructional approaches to foster the development of life-long learning in Arkansas Tech University students. The Department strives to: meet the general education needs of all undergraduates; provide specialized academic instruction appropriate for Departmental majors; and address ancillary instructional requirements beyond the scope of general education for outside majors.

Program Learning Outcomes		Expectations/Target for this Outcome	Findings/Results
1 **Calendar Year Assessment Information** 2021 Annual Assessment **NOTE** This Assessment Plan covers all options for Biology: Biology (BS) Biomedical (BS), Medical Lab Science (BS), and Nuclear Medicine Technology (BS) as all share the majority of core courses. ********* 2021 ANNUAL REVIEW ********* ********** APPROVALS & INFORMATION BLOCK (**NOTE**. This block provides a brief description of actions taking place (or planned to take place) during the current assessment cycle. If there are more (or less) outcomes assessed, please alter as necessary. Additional comments are also welcome.) Point of Contact for this year's assessment (add additional names as needed): 1) Eric Lovely 2) APPROVALS _____ Department Head Approval: Date: Dean Approval: Date: Office of Assessment Review: Amanda Gardner Date: 7/26/22 _____ Program Level Context: (ex. Second year using Weave Assessment Management System, or ADHE Program Review conducted on 3/15/20) Student Learning Outcomes Assessed during Calendar Year 2021 (Add more as necessary): Outcome 1: Scientific Reports We tested the new rubric for scientific reports and standardized the use of this rubric			

Program Learning Outcomes		Expectations/Target for this Outcome	Findings/Results
in 2021. _____ Additional Comments: The five program learning outcomes criteria do provide a good overview of the student's knowledge base and analytical skills as they complete the curriculum. The primary shortcoming of the rubrics we included is the courses may not fully engage with all aspects and nuances of the rubrics. If faculty develop lessons to engage students with the concepts measured by the nuances of the rubrics, student learning should improve. We assess the same outcomes in the same sections of classes for our Biomed and General Biology degrees and are typically unable to accurately separate these populations of students so the clumped assessment results are presented here.			
Outcome has action plan 1.1 Scientific Reports Students will construct reports which analyze data using scientific models to justify their conclusions. In 2021, we developed a new rubric and worked to standardize the use of this rubric in introduction, reinforcement, and mastery courses. See the new rubric in the files below, ACTION PLAN Faculty teaching courses mapped to this learning outcome are discussing approaches to improving student learning. They are adapting the rubric and how it is used to insure consistency from one course and instructor to another. DUE no due date set	1.1.1 Lab Reports Scientific reports are introduced in Principles of Biology (BIOL 1114). The concept is reinforced in Zoology (BIOL 2124), Botany (BIOL 2134), and Genetics (BIOL 3034). Mastery level of this concept is expected by Ecology (BIOL 3114). In 2018 and 2019, assessment of this learning outcome was reported for BIOL 1114, 2124, 3034, and 3114.		
Outcome has action plan 1.2 Science and Society	1.2.1 Human interactions with biological systems		

Program Learning Outcomes		Expectations/Target for this Outcome	Findings/Results
Students will evaluate the interactions between human and biological systems, and to articulate and convey societal relevance to the general public. ACTION PLAN Faculty teaching courses mapped to this learning outcome are discussing approaches to improving student learning. They are adapting the rubric and how it is used to insure consistency from one course and instructor to another. DUE no due date set	Human interactions with biological systems are introduced in Principles of Biology (BIOL 1114). The concept is reinforced in Botany (BIOL 2134), and Genetics (BIOL 3034). Mastery level of this concept is expected by Ecology (BIOL 3114). In 2018 and 2019, assessment of this learning outcome was reported for 3034, and 3114.		
Outcome has action plan 1.3 Diversity of Life Students will describe characteristics and diversity of life. ACTION PLAN Ivan Still suggests, "Mastery of this should be achieved by the END of the core courses, and so Genetics, Micro, Physiology and Ecology should all be in here. One of the big things we are missing is relevant progression data for LO3 from BIOL1114 to the 3000 level mastery core courses, especially as the MFAT not only deals with content	1.3.1 MFAT exam results Describing the characteristics and diversity of life is the core of biological concepts. It is introduced in Principles of Biology (BIOL 1114). The concept is reinforced in Zoology (BIOL 2124) and Botany	1.3.1.1 Met Student scores should exceed the national average National average on the biology MFAT exam over the past six years is 151.	Averages of students in the biology program range from 150 to 161. REFLECTION ON FINDINGS AND RECOMMENDATIONS FOR NEXT STEPS

Program Learning Outcomes		Expectations/Target for this Outcome	Findings/Results
knowledge but also critical thinking. So I think that that is a huge action item for 2020, if we are thinking about how the curriculum may need to be developed to meet our expectations and, of course, for students to be competitive in the workplace. So having indicated an issue, here's a proposal to deal with that issue: I suggest that specialists in their fields develop a set of questions that could be input to final exams/course assignments to assess elements of this LO in the different core courses (I believe I had forwarded such multiple choice questions for Cell aspects to Eric when we initially started all this discussion, but I can re-email them as necessary)." Ty Yamashita commented, "My genetics course tangentially examines this outcome from a molecular perspective and investigate two rubric components: Characteristic of life and Making Connections (How mechanisms, pathways, organelles, organs, and organ are involved in each the characteristics of life). The MFAT may not capture more nuanced aspects of this outcome, but a good background knowledge of this outcome will be reflected in MFAT scores." DUE no due date set	(BIOL 2134). Mastery level of this concept is expected by Genetics (BIOL 3034) and the MFAT exam. In 2018 and 2019, assessment of this learning outcome was reported for BIOL 3034, 4094 and the MFAT exam.		
1.4 Lab Techniques Students will demonstrate common lab procedures, operate lab and field equipment, perform sterile techniques, and conduct online data analyses.	1.4.1 Lab Procedures Lab procedures are introduced in Principles of Biology (BIOL 1114). The lab procedures we currently assess include Microscopy, DNA		

Program Learning Outcomes		Expectations/Target for this Outcome	Findings/Results
	Isolation, Lab Safety, and Dissection. In 2018 and 2019, assessment of this learning outcome was reported for BIOL 1114, 2134, 3034, and 3054. Very high levels of proficiency in Principles (1114) and Microbiology (3054) but not Botany (2134) indicates instructors should clarify the use of the rubrics before conclusions are reached.		
Outcome has action plan 1.5 Scientific Literature Students will analyze current scientific literature and present their evaluation in written and oral formats. ACTION PLAN Faculty teaching courses mapped to this learning outcome are discussing approaches to improving student learning. They are adapting the rubric and how it is used to insure consistency from one course and instructor to another. They are developing research paper	1.5.1 Biology Seminars and Literature Scientific literature and presentations is a keystone concept in biology. The concept is introduced in Zoology (BIOL 2124) and reinforced in Genetics (BIOL 3034). Mastery level of this concept is		

Program Learning Outcomes		Expectations/Target for this Outcome	Findings/Results
projects in courses mapped to this criteria to help students develop these learning outcomes.to help students DUE no due date set	expected in Biology Seminar. In 2018 and 2019, assessment of this learning outcome was reported for 3034 and Biology Seminar.		

Project Attachments (1)

Attachments	File Size
Rubric for grading scientific reports.docx	12KB

Rubric for grading scientific reports.

Criteria	Basic	Intermediate	Proficient
INTRODUCTION			
Provides accurate and relevant context			
States and justifies valid hypotheses			
METHODS			
Provides detailed and well-designed methods			
RESULTS			
Clearly presents data in tables/figures			
Describes results concisely and completely (including statistical analyses as relevant)			
DISCUSSION			
Bases interpretation on stated results			
Places findings in broader scientific context			
Considers study limitations			
REFERENCES			
Properly cites primary literature			