General Education Assessment Action Plan Progress Report

GENERAL EDUCATION COMPETENCY AREA: Natural Sciences

ASSESSMENT CYCLE: 2021-22 to 2024-25

1. Pedagogical / Curriculum

Planned Action #1

Geology: To address the concern that students were better at mastering facts, but they were less so at applying the facts, the faculty will rely, in part, on a newly created Argument Driven Inquiry (ADI) model that was first implemented in Spring 2023. This activity was intended to be used as a 3-week module in GEOL1501 – Dynamic Earth. The module is designed to help students master concepts pertaining to surface water-groundwater interactions, and then apply those concepts in a real-world scenario. Results from the module may be used to determine whether additional ADI modules should be developed and phased into the rotation of activities in the GEOL1501 labs. To address poor alignment of content with competency outcome 4, the faculty will add “GEOL1010 - Geology Goes to Hollywood” to the assessment plan. The student learning outcomes in this course were designed to align with the competency outcomes of the General Education Assessment Plan from the onset. The faculty believe using various instruments in GEOL1010 will provide more robust results to adequately address competency 4.

Progress on Planned Action #1
Geology: An additional two ADI modules are currently being developed to augment the original ADI module that was deployed. Geology goes to Hollywood has been added to the assessment plan for the General Education Natural Sciences Assessment.

Planned Action #2

Biology: We will add an exercise in Biol 1101 to address student learning outcome 3, the outcome with the lowest percent of students in Biology meeting expectations (64%). This exercise will require students to use example data to practice explicitly justifying evidence, placing that evidence in a scientific context, and discussing differences in claims and evidence used by various individuals. Having an opportunity to walk through these steps with example data will hopefully clarify to the students what is needed when they are discussing their own data collected in experiments throughout the semester.

Progress on Planned Action #2
Biology: The students currently have 3 main opportunities to weigh evidence and use evidence to justify their claims. We are adding an additional opportunity for them to practice this skill right at the beginning of the semester in Biol 1101 so we can see additional improvements in this SLO.

Planned Action #3

Physics: We will add more material and examples of justification of experimental results to the lab manual, and to the “Peer review” videos for each investigation. These videos are posted to help students with their peer reviews, but many students also use them to help them write their lab reports.

We will also add material on the importance of discussing agreement (or disagreement) with peers in the lab reports.

Progress on Planned Action #3
Physics: We are changing the lab report videos from “Peer Review Videos” to “Investigation Overview Videos” to provide a better description of their purpose to the students. We have adapted the videos to include information on justification.We are in the process of rolling them out into the laboratory Canvas materials. An unexpected trasition in the laboratory coordinator role delayed the full implementation of this. The revised lab manual material will be in the Fall 2025 editions of the lab manuals, and a complete set of Investigation Overview Videos will be available to the students on Canvas.

Planned Action #4

Chemistry: We will add supplementary materials on linking the science concept to the questions and how that provides the basis for the justification. We will also add material on the importance of discussing agreement (or disagreement) with peers in the lab reports. We may add a post argumentation observation sheet for students to use during the whiteboard session.

Progress on Planned Action #4
Chemistry: All graded assignments have a specific rubric scoring student work that identifes the science concept and the importance of comparison with peer results. All whiteboards are uploaded to CANVAS for review as well as digital notebooks with all student data.

2. Student Support Services

Planned Action #5

All departments: Tutoring services and study skills workshops are available to students in all General Education science courses through the Pirate Academic Support center. These services will be advertised to students. In addition, some departments (e.g., Biology Chemistry, and Physics) use trained undergraduate Learning Assistants in their classes to provide additional opportunities for student help beyond what the instructor can offer.

Progress on Planned Action #5
Biology: These Pirate Academic Support Center services have been extensively advertised to students through our Biology Resource Fair (What’s Up Bio), individual classes, and enhanced use of the ECU Connect app. Learning Assistants are being used in multiple course sections.

Physics: We continue to advertise for the Pirate Academic Support Center and to refer students to it. We provide learning assistants for all sections of the PHYS 2350 University Physics I and PHYS 2360 University Physics II courses.

3. Faculty Development

Planned Action #6

All departments: Faculty in all units will be encouraged to seek the support of ECU’s Office for Faculty Excellence and apply to participate in opportunities regarding support for course redesign or curriculum best practices.

Progress on Planned Action #6

GEOLOGY: Faculty in Geology have taken advantage of opportunities offered by the ECU's Office of Faculty Excellence and other entities to redesign courses and apply best practices to teaching (e.g., Redesigning GEOL1501 to follow an Argument Driven Inquiry based model, and acquiring Quality Matters certification in other Geosciences courses).

CHEMISTRY: Dr. Walker has restructured the laboratory courses with five new modules that relate to the course content. In addition, alignment of lecture and lab pacing has been made explicit to all instructors.

BIOLOGY: Two new fixed-term faculty who teach General Education courses are receiving stipends to participate in teaching professional development through the Office for Faculty Excellence. Many of our faculty participate in other OFE programming, as reported in Faculty 180. In addition, we held department-wide meetings to discuss and enhance the curriculum of Biol 1200.

PHYSICS: Many Physics faculty have participated in OFE programming. We will continue to emphasize the importance of professional development and encourage faculty to participate in course redesign training.

Planned Action #7

Biology: We will spend time in one of our initial weekly meetings with the lab instructors reviewing strategies to facilitate student development of these specific skills. We will also relate to the faculty in the accompanying lecture course the language we use in the labs and encourage them to try to incorporate skill-building activities into their lecture sections.

Progress on Planned Action #7

Biology: We devote time in each weekly meeting to discuss challenges that may arise and evidence-based ways to address those challenges. We also offer a course (Biol 7970) for graduate students (many of whom teach these labs) to learn more about evidence-based teaching practices. We have faculty working with the 1101 and 1201 lab courses who also teach the associated lecture sections (1100, 1200) who work to increase standardization of language and skills (e.g., using evidence to justify claims) between the lecture and lab formats.

Planned Action #8

Physics: We will spend time in our weekly instructor/TA meetings emphasizing student development of the skills associated with SLO3.

Progress on Planned Action #8

Physics: We have spent time in the weekly TA meetings discussing the scope and limits of science and scientific inquiry, and, importantly, the need for students to justify their conclusions to emphasize that they fall within the limits of their particular study. We hope to see improvement in student lab reports as a result of this emphasis.

Planned Action #9

Chemistry: We will share these findings with all new TA's in the summer training and weekly instructor/TA meetings emphasizing student connecting the question to the science concept, and how that feeds into the justification. We will discuss adding a post argumentation observation sheet for students to use during the whiteboard session.

Progress on Planned Action #9
Chemistry: We have spent time during the weekly meetings specifically on the science concept for all aspects of lab. Emphasized further in discussions about scoring the lab reports.

4. Other Areas

Planned Action #10

Geology: Other activities that the faculty will undertake include emphasizing the relevance of geology to students, and also highlighting the altruistic aspect of geology by emphasizing the different types of jobs geoscientists do.

Progress on Planned Action #10
Geology: Faculty have described what jobs geoscientists do at the start of the semester and they have also emphasized the role that geoscientitsts play in helping communities in various settings.