Assessment Plan

BA in Earth Science
College of Natural, Applied and Health Sciences
Kean University

Mission:
The Earth Science, Geology and Meteorology Program at Kean University has several related goals that are aligned with the University and College Missions. The programs in Earth Science are designed to prepare the student for teacher certification in earth science and elementary education with an earth science specialization. The programs are also designed to prepare students for career in both public and private sectors jobs where diverse interdisciplinary knowledge in Earth Science discipline is required. The strong interdisciplinary approach and system approach to study the earth as a system cover a wide aspect from the traditional earth science specialty areas such as geology, meteorology, oceanography, geography, environment science and also astronomy. The mission of the program from these diverse specialties in earth science is to provide students with strong scientific background, interdisciplinary problem solving skills and strong communication skills.

Assessment Process:

Earth Science students have five (5) core courses to take as part of the requirements for the major. These five core courses provide a sound backbone of the discipline with regard to the research and theoretical aspects of Earth Science as well as the various areas of study within this field. As such, these core courses are the primary vehicle for assessing the knowledge of our students. Beyond the core courses, students take three (3) more elective courses, and it is likely that no two (or very few) majors take the exact same grouping of courses. Therefore, the faculty have agreed to center our assessment on the five core courses that cover the core knowledge of Earth Science phenomena and interpretation.

Each core course has assessment tools such as exams, research and reflective writing assignments, portfolio work, group work products, etc., as part of the evaluation process and the Earth science program has used results of assessment for making improvements to program practices aimed at increasing student learning. For example, previously, our program had 4 seminar courses (ES 4953-4954, ES 4963-4964) with two credits each which were offered in the Fall and Spring terms. Recently, however, there has been a significant increase in first and second teacher education majors. As a result, a new one-term core course, ES 4981 Environmental Issues Seminar (3 credits), offered in the Fall and Spring terms, has been developed to better accommodate such students. As such, these students have now more choices to better accommodate and not interfere with their Spring student teaching schedule, as well as providing several sections to be offered later in the day or evening. At the same time, importantly, this new seminar course will provide opportunities for the students to be actively involved with important environmental issues of the day. This will include critical thinking and analysis, a debate forum, potential guest speakers, among others. As such, importantly, this course will provide an opportunity for our program to modify and make use of the various rubrics developed by General Education for our students, to critically assess student outcomes, from initial end of the exams that will better reflect group work, writing and oral assignments, portfolio work, etc. As a result, the program will be able to critically assess the course and determine where improvements, clarifications, as well as restructuring are needed.
The culminating assignment done in the Capstone Course has been identified as a direct measure for assessing attainment of our program Student Learning Outcomes. In this course, assessment data are collected from an assignment that requires students to provide the evidence of meeting program goals. Each semester, composite data from scored student assignments are collected and analyzed to address areas of program strengths and weaknesses and to inform our decisions ultimately resulting in program improvements. In addition, a systematic process for gathering data utilizing an indirect measure, the Graduating Student Survey, was established. Data from the student survey will also help inform our decisions regarding program improvement to increase student learning.

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**Students who graduate with a BA Earth Science should be able to:**

**SLO1:** Identify and explain different steps involved in the study and analysis of earth science phenomena. (KU1, KU3, GE K1, GES1, GES2, GES3, GES4, GESS, GEV1, GEV4)

**Direct Measure:** - **Measure 1:** ES 4953, ES 4954, and ES 4981 Earth Science Seminar I & II: Evaluation form to grade term papers with 9 rubrics on a scale of 1 to 5 (worst to best).

- **Measure 2:** ES 4953, ES 4954, and ES 4981 Evaluation form to grade presentation with rubrics on a scale of 1 to 5 (worst to best) (starting Fall 2012)

**Indirect Measure:** - **Measure 1:** ES 4953, ES 4954, and ES 4981 pre and post 10-question survey with rubrics graded from 1 to 10 (worst to best) to demonstrate achievement of program goals.

Graduating Student Survey

**SLO2:** Analyze processes generating earth science phenomena and explain their spatial and temporal distribution. (KU1, GEK1, GES1, GES2, GES3, GES4, GESS, GEV1, GEV4)

**Direct Measure:** - **Measure 1:** ES 4953, ES 4954, and ES 4981 Earth Science Seminar I & II: Evaluation form to grade term papers with 9 rubrics on a scale of 1 to 5 (worst to best).

- **Measure 2:** ES 4953, ES 4954, and ES 4981 Evaluation form to grade presentation with rubrics on a scale of 1 to 5 (worst to best) (starting Fall 2012)

**Indirect Measure:** - **Measure 1:** ES 4953, ES 4954, and ES 4981 pre and post 10-question survey with rubrics graded from 1 to 10 (worst to best) to demonstrate achievement of program goals.

- **Measure 2:** Graduating Student Survey (starting Fall 2012)

**SLO3:** Distinguish and characterize the interrelationship between earth science factors. (KU1, GEK1, GES1, GES2, GES3, GES4, GESS, GEV1, GEV4)

**Direct Measure:** - **Measure 1:** ES 4953, ES 4954, and ES 4981 Earth Science Seminar I & II: Evaluation form to grade term papers with 9 rubrics on a scale of 1 to 5 (worst to best).

- **Measure 2:** ES 4953, ES 4954, and ES 4981 Evaluation form to grade presentation with rubrics on a scale of 1 to 5 (worst to best) (starting Fall 2012)

**Indirect Measure:** - **Measure 1:** ES 4953, ES 4954, and ES 4981 pre and post 10-question survey with rubrics graded from 1 to 10 (worst to best) to demonstrate achievement of program goals.

- **Measure 2:** Graduating Student Survey (starting Fall 2012)
**Student Learning Outcomes – Knowledge**

**Students will demonstrate proficiency in knowledge and content by:**

1) applying the scientific method to understand natural concepts and processes (GEK1)
2) evaluating major theories and concepts in social sciences (GEK2)
3) relating literature to historical context (GEK3)
4) evaluating major theories and concepts in the fine arts (GEK4)

**Student Learning Outcomes – Skills**

**Students will demonstrate the skills and technology necessary to:**

1) write to communicate and clarify learning (GES1)
2) communicate effectively through speech (GES2)
3) solve problems using quantitative reasoning (GES3)
4) think critically about concepts in multiple disciplines (GES4)
5) demonstrate information literacy (GES5)

**Student Learning Outcomes – Values**

**Students will exhibit a set of values that demonstrate**

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**Direct Measure:**

-Measure 1: ES 4953, ES 4954, and ES 4981 Earth Science Seminar I & II: Evaluation form to grade term papers with 9 rubrics on a scale of 1 to 5 (worst to best).

-Measure 2: ES 4953, ES 4954, and ES 4981 Evaluation form to grade presentation with rubrics on a scale of 1 to 5 (worst to best) (starting Fall 2012)

**Indirect Measure:**

-Measure 1: ES 4953, ES 4954, and ES 4981 pre and post 10-question survey with rubrics graded from 1 to 10 (worst to best) to demonstrate achievement of program goals.

-Measure 2: Graduating Student Survey (starting Fall 2012)

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**SLO4:** Examine, articulate and illustrate the interaction between earth science phenomena and people. (KU1, KU2, GEK1, GES1, GES2, GES3, GES4, GES5, GEV1, GEV2, GEV3, GEV4, GEV5)

**Direct Measure:**

-Measure 1: ES 4953, ES 4954, and ES 4981 Earth Science Seminar I & II: Evaluation form to grade term papers with 9 rubrics on a scale of 1 to 5 (worst to best).

-Measure 2: ES 4953, ES 4954, and ES 4981 Evaluation form to grade presentation with rubrics on a scale of 1 to 5 (worst to best) (starting Fall 2012)

**Indirect Measure:**

-Measure 1: ES 4953, ES 4954, and ES 4981 pre and post 10-question survey with rubrics graded from 1 to 10 (worst to best) to demonstrate achievement of program goals.

-Measure 2: Graduating Student Survey (starting Fall 2012)

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**SLO5:** Demonstrate a good understanding and communication skills of earth science phenomena. (KU1, KU3, GEK1, GES1, GES2, GES3, GES4, GES5, GEV1, GEV4)

**Direct Measure:**

-Measure 1: ES 4953, ES 4954, and ES 4981 Earth Science Seminar I & II: Evaluation form to grade term papers with 9 rubrics on a scale of 1 to 5 (worst to best).

-Measure 2: ES 4953, ES 4954, and ES 4981 Evaluation form to grade presentation with rubrics on a scale of 1 to 5 (worst to best) (starting Fall 2012)

**Indirect Measure:**

-Measure 1: ES 4953, ES 4954, and ES 4981 pre and post 10-question survey with rubrics graded from 1 to 10 (worst to best) to demonstrate achievement of program goals.

-Measure 2: Graduating Student Survey (starting Fall 2012)
1) personal responsibility (GEV1)
2) ethical and social responsibility (GEV2)
3) social and civic engagement (GEV3)
4) respect for diverse cultures and perspectives (GEV4)
5) life-long learning (GEV5)