

## Form E-1-A for Boston College Core Curriculum

Department/Program: **EARTH AND ENVIRONMENTAL SCIENCES**

**1) Have formal learning outcomes for the department's Core courses been developed? What are they?** (What specific sets of skills and knowledge does the department expect students completing its Core courses to have acquired?)

EESC Core courses are designed to help students achieve the Learning Goals listed below. Although any given EESC Core course is unlikely to promote every goal on this list, our Core course faculty endeavor to promote as many of these goals as possible in each course.

1. Demonstrate an awareness of how scientific concepts and methods are employed in the study of planet Earth and its environment, and how this awareness is necessary for liberally educated people in the 21st century.
2. Demonstrate an awareness of the principles and strategies of natural science that are employed in the study of planet Earth and its environment.
3. Demonstrate an awareness of the critical role that the Earth and Environmental sciences play in contemporary society.
4. Demonstrate an awareness of the power of the scientific method in the study of planet Earth and in solving the Earth's environmental problems.
5. Demonstrate an awareness of the limitations of science in the study of planet Earth and in solving Earth's environmental problems.
6. Demonstrate an awareness of the application of mathematics and other sciences as they are used in the study of planet Earth and its environment.
7. Demonstrate how the Earth and Environmental sciences affect humans.
8. Demonstrate how humans are effecting the environment and habitability of our planet.

**2) Where are these learning outcomes published? Be specific.** (Where are the department's expected learning outcomes for its Core courses accessible: on the web, in the catalog, or in your department handouts?)

These goals will be included in the description of the undergraduate curriculum on the Department of EESC website (<https://www.bc.edu/bc-web/schools/mcas/departments/eesc/undergraduate/fulfilling-the-core-requirements.html>), in the BC catalog, and in handouts available in the Department's main office for students expressing interest in taking Core courses in Earth and Environmental Sciences.

**3) Other than GPA, what data/evidence is used to determine whether students have achieved the stated outcomes for the Core requirement?** (What evidence and analytical approaches do you use to assess which of the student learning outcomes have been achieved more or less well?)

In May 2019, our assessment of the core curriculum focused on the Core Renewal. Faculty members Gail Kineke, Ethan Baxter, and John Ebel described their experiences teaching Enduring Questions (Kineke and Baxter) and a Complex Problems course (Ebel) during the past academic year. Gail and Ethan taught their courses for the second time, and both found that they were even better than the first time. Gail taught her Living on the Water class (EESC1702). Her reflection sessions, including a Cape Cod fieldtrip, a guest lecture, a trip to the Isabella Stewart Gardner Museum and a visit from the Career

Center, went over very well. She was impressed with the quality and level of engagement of the students, and found that the group bonded well. The final project was joint between the paired Enduring Questions course (EESC and Art History) and synthesized various aspects of papers/projects from throughout the term. Ethan's Building a Habitable Planet class (EESC1701) received excellent reviews. It contained a number of successful reflection sessions, including talks by Michael Himes, and leading environmental thinkers James Balog and Sylvia Earle, watching the movie Contact, and tracing geological time up the large staircase from Conte Forum to Devlin. Ethan noted that the final paper highlighted a surprising lack of knowledge from freshman on basic writing protocols (citations, plagiarism, research, etc), which he therefore plans to give more attention in future iterations of the course. John taught Powering America (EESC1507) for the first time. He found it to be a highly successful course, requiring considerable effort from instructors and students, but yielding excellent gains. Considerable attention was given to writing through weekly assignments, and the students uniformly reported that their writing improved over the semester. There was a progression of three term papers, first on the history of energy issues, then on active research, and finally discussing how energy should evolve in the future. Many students said they took the course to satisfy requirements or for grades, but finished up focused on the skills they had gained.

**4) Who interprets the evidence? What is the process?** (Who in the department is responsible for interpreting the data and making recommendations for curriculum or assignment changes if appropriate? When does this occur?)

The department faculty meets annually to review all aspects of our Core course offerings, and to make recommendations to the whole department for improvement. The Director of Undergraduate Studies leads this process. The conclusions of those discussions are reviewed by all full-time faculty, and presented in department annual reports. Other faculty meetings are held throughout the year (approximately twice per month) in which we continuously work towards gathering and interpreting data for reviewing our Core Learning Goals and how well our Core curriculum is achieving our Learning Goals.

**5) What were the assessment results and what changes have been made as a result of using this data/evidence?** (What were the major assessment findings? Have there been any recent changes to your curriculum or program? How did the assessment data contribute to those changes?)

The following Core Pilot Courses have been added to our Core curriculum:

- Global Implications of Climate Change (Pisani-Gareau, EESC; and Gareau, Sociology), Fall 2015, 2017, 2019
- A Perfect Moral Storm: The Science and Ethics of Climate Change (Wong, EESC; and Storey, Philosophy), Spring 2017
- Building a Habitable Planet: The Origins and Evolution of the Earth: Geoscience Perspectives (Baxter, EESC; and DeLong-Bas, Theology), Spring 2017 and 2019
- Living on Water (Kineke, EESC; and Leone, Fine Arts), Fall 2017 and 2018
- Powering America (Ebel, EESC; and Valencius, History), Spring 2019 and 2020

During our May 2019 meeting, we evaluated trends in our course and enrollment statistics over the past five years. These results show that our increased teaching in core renewal has modestly decreased the total number of students as well as the number of major-level courses we teach. Our

department strongly values our participation in the core renewal process because our science lends itself to rigorous, interdisciplinary inquiry. At the same time, we will be conscious of these trends as we plan our curriculum in the coming years, particularly with new faculty hires.

We are still in the process of fine-tuning our Core Learning Goals and designing ways to investigate evidence that changes we have made have resulted in improved learning outcomes.

**6) Date of the most recent program review.** (Your latest comprehensive departmental self-study and external review.)

Spring 2010