

TRANSPARENT TEACHING: AN OPEN-SOURCE CODE FOR STUDENT LEARNING

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We are developing a team-taught course, *Surviving on Planet Earth*, that uses a new approach to teacher-student interaction. The *pedagogical goals* are to 1) get students directly involved in course design and 2) develop teaching and assessment methods that are highly aligned with course goals, transparent, and without mystery to students. We accomplish these by engaging students in the instruction and assessment process and, thereby, giving them more responsibility for their learning.

The overall *course goal* is to promote enthusiasm and geological acumen while helping students develop intellectual and metacognitive skills to help them become successful citizens. *Course objectives* are to help students 1) think about big issues that affect their lives and, perhaps most important, have them realize that thinking critically and creatively about such issues is important; 2) integrate science and engineering, the humanities, and social science in a meaningful way; 3) understand that they cannot address important, fundamental, day-to-day issues without considering these disciplines; 4) develop the skills and confidence to understand information from diverse sources; 5) develop the skills and confidence to apply critical thinking to complicated real-world problems; 6) understand the importance of quantitative reasoning skills; 7) develop written and oral communication skills; and 8) see issues facing Earth's inhabitants from the perspectives of diverse cultures.

Topics covered include: earthquakes and volcanoes; diversity, extinction, Darwin; the nature of science; human population and impact on Earth; floods and water shortages; and preservation of nature and land-use planning.

Students are responsible, in large part, for directing class activities and assessment. They provide *Just-In-Time-Teaching* feedback on reading and homework before every class through *Moodle*. Instructors use the feedback to plan class activities. This means that students' outside-of-class preparation fundamentally affects what happens during class. Learning and goals assessment are accomplished using carefully designed rubrics developed for each activity. Students have the rubrics ahead of time so they know exactly what the goals are, and can use the rubrics to assess themselves. Our end game is to involve a generally reluctant student body into active and reflective participation.

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