Course Information

Date Submitted:

Current Prefix and Number: EES - Earth and Environmental Sciences, EES 151 EARTH DYNAMICS

Other Course:

Proposed Prefix and Number: EES 151

What type of change is being proposed?

Major Change

Should this course be a UK Core Course? No

1. General Information

a. Submitted by the College of:

b. Department/Division:

c. Is there a change in 'ownership' of the course?

If YES, what college/department will offer the course instead: Select...

e. Contact Person

Name:

Email:

Phone:

Responsible Faculty ID (if different from Contact)

Name:

Email:

Phone:

f. Requested Effective Date

Semester Following Approval: No OR Effective Semester:

2. Designation and Description of Proposed Course

a. Current Distance Learning (DL) Status: N/A

b. Full Title:

Proposed Title:

c. Current Transcript Title:

Proposed Transcript Title:

d. Current Cross-listing:

Proposed – ADD Cross-listing :

Proposed – REMOVE Cross-listing:

e. Current Meeting Patterns

Proposed Meeting Patterns

f. Current Grading System:

Proposed Grading System:

g. Current number of credit hours:

Proposed number of credit hours:

h. Currently, is this course repeatable for additional credit? No

Proposed to be repeatable for additional credit? No

If Yes: Maximum number of credit hours:

If Yes: Will this course allow multiple registrations during the same semester? No

2i. Current Course Description for Bulletin:

Proposed Course Description for Bulletin:

2j. Current Prerequisites, if any:

Proposed Prerequisites, if any:

2k. Current Supplementary Teaching Component:

Proposed Supplementary Teaching Component:

3. Currently, is this course taught off campus? No

Proposed to be taught off campus? No

If YES, enter the off campus address:

4. Are significant changes in content/student learning outcomes of the course being proposed? No

If YES, explain and offer brief rational:

5a. Are there other depts. and/or pgms that could be affected by the proposed change? No

If YES, identify the depts. and/or pgms:

5b. Will modifying this course result in a new requirement of ANY program? No

If YES, list the program(s) here:

6. Check box if changed to 400G or 500: No

Distance Learning Form

Instructor Name:

Instructor Email:

Internet/Web-based: No

Interactive Video: No

Hybrid: No

1.How does this course provide for timely and appropriate interaction between students and faculty and among students? Does the course syllabus conform to University Senate Syllabus Guidelines, specifically the Distance Learning Considerations?

2.How do you ensure that the experience for a DL student is comparable to that of a classroom-based student's experience? Aspects to explore: textbooks, course goals, assessment of student learning outcomes, etc.

3.How is the integrity of student work ensured? Please speak to aspects such as password-protected course portals, proctors for exams at interactive video sites; academic offense policy; etc.

4.Will offering this course via DL result in at least 25% or at least 50% (based on total credit hours required for completion) of a degree program being offered via any form of DL, as defined above?

If yes, which percentage, and which program(s)?

5.How are students taking the course via DL assured of equivalent access to student services, similar to that of a student taking the class in a traditional classroom setting?

6.How do course requirements ensure that students make appropriate use of learning resources?

7.Please explain specifically how access is provided to laboratories, facilities, and equipment appropriate to the course or program.

8.How are students informed of procedures for resolving technical complaints? Does the syllabus list the entities available to offer technical help with the delivery and/or receipt of the course, such as the Information Technology Customer Service Center (http://www.uky.edu/UKIT/)?

9.Will the course be delivered via services available through the Distance Learning Program (DLP) and the Academic Technology Group (ATL)? NO

If no, explain how student enrolled in DL courses are able to use the technology employed, as well as how students will be provided with assistance in using said technology.

10.Does the syllabus contain all the required components? NO

11.I, the instructor of record, have read and understood all of the university-level statements regarding DL.

Instructor Name:

UNIVERSITY OF
KENTUCKY®

Earth and Environmental Sciences
101 Slone Bldg.
Lexington KY 40506-0053
859 257-3758
ees.as.uky.edu

MEMORANDUM

FROM: Rebecca Freeman, Assistant Professor and Director of Undergraduate Studies

Rebecca L. Freeman

RE: EES 151 Course Change Proposal

The only changes proposed to EES 151 are to change its title (from "Earth Dynamics" to "Quantitative Planet") and to correct a minor mistake in the bulletin course description (from "UK Core: Quantitative Reasoning" to "UKCore Quantitative Foundations".

The rationale is that the students do not understand the term "Earth Dynamics" and therefore are uncertain as to the nature of the course. "Quantitative Planet" not only alerts them to the fact that it can serve as a "Quantitative Foundations" course, but also references our other popular UK Core courses (Endangered Planet, Sustainable Planet, and Blue Planet).

This course has already been approved as a UK Core Course. I have attached a partial signature routing log for this approval process, which began in 2010. Please note that our departmental prefix at the time was GLY, but has subsequently been changed to EES.

Student and Academic Life
230 McVey Hall
Lexington, KY 40506-0045

859 257-3027
fax 859 257-1455

www.uky.edu

November 23, 2016

Memorandum

To: Senate Council

From: Joanie Ett-Mims, UK Core Education Committee coordinator

Re: EES course change UKCEC approval

The UKCEC received a course change request for EES 151 on September 21, 2016. The request was to change the title of the course. Since the course has already been approved for UK Core and no changes to the course content were requested, the UKCEC did not require the department to attach the course review form in eCATS. The UKCEC voted to approve the course and sent it forward to the Undergraduate Council on November 22, 2016.

The Undergraduate Council voted to approve the course change and sent it forward to Senate Council on November 29, 2016.

Thank you for your consideration.

EES 151-001: QUANTITATIVE PLANET

A UKCore Course in "Quantitative Foundations"

Dept. of Earth and Environmental Sciences

Fall 2011: 3 Credit Hours

Instructor: Dave Moecher, Professor (http://ees.as.uky.edu/users/moker).
Office: 304 Slone Building; office phone: 859-257-6939; e-mail: moker@uky.edu
Preferred method of reaching instructor: email
Office Hours: W 2-3 p.m., or by appointment, or whenever I am in my office—just knock!

Teaching Assistant: Mr. Ralph Bandy (ralph.bandy@uky.edu);
Office: 305B Slone Building
Preferred method of reaching teaching assistant: email
Office Hours: W 2-4 p.m.

Class Meeting Time and Place: Lecture: MWF 2-2:50, 303 Slone Building

Course Description: A basic problem solving approach to quantifying and predicting how Earth changes through time. Involves application of math skills sufficient for UK admission. Satisfies the UKCore Quantitative Foundations requirement. No prerequisites.

Prerequisites: None.

This course is intended for freshmen. Although there are no prerequisites, it is assumed that students will enter the course with the same background necessary for MA 109 (College Algebra): the course assumes an appropriate mastery of high school mathematics through Algebra I, Algebra II, and Geometry to earn a Math ACT score of at least 19, or the equivalent. This course satisfies the **UKCore** *Quantitative Foundations* requirement, but it is NOT a prerequisite for any other course at UK requiring appropriate math proficiency (e.g., a calculus course required specifically for a major).

Learning Outcomes

Upon completion of this course, students will be able to:

1. Correctly apply the techniques of algebra, geometry, and logic to analyze and solve problems.

2. Demonstrate proficiency with number sense and with functional relationships between two or more variables (e.g., equation of a straight line: y = mx+b); compare different representations of those relations algebraically, symbolically, in tables, using graphs, and verbally.

3. Recast and formulate relevant geological problems in an appropriate mathematical and logical manner, and express them verbally and visually.

4. Apply the correct methods of argument and proof to test hypotheses, negate or confirm results, and consider alternative solutions.

5. Identify and evaluate arguments based on fallacious or erroneous reasoning and detect limits of specific models; recognize misinterpretations of data, graphs, and descriptive statistics.

6. Identify appropriate sources of data including primary electronic and print media.

7. Interpret and communicate results of tests and analyses in a written, oral, and visual format.

Course Goals/Objectives: The theory of ***plate tectonics*** revolutionized our understanding of how Earth works and how Earth changed over the vast span of geologic time. The theory proved that our planet has evolved in a dynamic but predictable and quantifiable manner since the formation of the solar system. This course, designed primarily for non-science majors, will take a problem-solving approach, applying algebra, trigonometry, and basic statistics to allow students to quantify and predict why, where, how rapidly, and when processes such as earthquakes, volcanoes, and plate motions occur. Students will often work in small groups to increase confidence in orally communicating their quantitative thinking and defending their logic, as well as providing an opportunity to consider alternative problem solving strategies.

Required Materials: You will need a calculator! Have a calculator or a calculator app handy at times. We will also use Microsoft Excel for calculations and graphical analysis of data, Microsoft Word for preparation of written reports and projects, and Microsoft PowerPoint for class presentation of projects. These applications can be obtained from the UK software download site (www.uky.edu/download).

The primary readings are available at Wikipedia; i.e., no textbook is required. However, you will be tested on reading material in lecture **exams** and **quizzes**. We will also use other on-line resources and web sites, maps and diagrams provided by the instructor. If you have a laptop, tablet, or other device that can access the internet, bring it to class. Please mute your devices.

What will we do in this class? All UK students are required to take a course that satisfies the **UKCore** *Quantitative Foundations* requirement (http://www.uky.edu/ukcore/). This course will apply algebra, geometry, and trigonometry to solve problems related to plate tectonic processes and dynamic evolution of the earth through time. All Kentucky high school students (and most out-of-state students) have been introduced to the math concepts we use in this course, and many of the basic earth science concepts as well. So there is nothing new about much of this course! We will review all math concepts as we apply them.

How will we do it? Primarily through in-class, individual and small group activities, and regular homework problem sets. You will be expected on a weekly basis to be involved in completing reading assignments and individual or small group exercises. Although we have a detailed course outline and schedule, the instructor reserves the right to modify that schedule slightly to integrate current Earth events into the course activities (i.e., volcanic eruptions, earthquakes, landslides, tsunamis, meteorite impacts, and other exciting natural events).

Role of lecture sessions: we meet on Mon., Wed., and Fri. to introduce earth science concepts and review/apply quantitative methods. I will present the core content using PowerPoint presentations that will be available for downloading before class (see **Canvas** web site). You should print those notes and

bring them to class, or bring your laptops or tablets. We will do individual and small group in-class exercises.

Role of independent work outside of class: as with any University level course, you will be expected to do complete work outside of class, including reading, homework, and a group project.

Grading, Exams, and Assignments

- *Overall grade components*:

Activity	How many?	Percentage of Final Grade
Midterm Exams	3	30%
Final Exam	1	15%
Project	1	10%
Quizzes	7	10%
Homework and In-class activities	8	35%

- *Overall grading*: ≥ 90 = A, 80-89 = B, 70-79 = C, 60-69 = D, below 60 = E. The grade cutoffs may be adjusted downward (only) if necessary.
- **Exams:** May include multiple choice, definitions, true/false questions, and/or short answer problem-solving questions. The final exam ***will be*** course comprehensive. More details will be provided before each exam. All material covered in lecture and homework assignments should be reviewed in preparation for the exams. Lecture notes will be related to the textbook, but supplemental handout material not in the textbook will also be discussed in class. You will be allowed to drop one exam grade.
- **Final Exam**: The final exam is scheduled for Friday, Dec. 16, 2011 at 8 am in Slone 303.
- **Midterm Grading**: Midterm grades will be posted in myUK by the deadline established in the Academic Calendar (http://www.uky.edu/Registrar/AcademicCalendar.htm)
- **Quizzes**: Quizzes are scheduled at regular intervals. You may drop one quiz grade for unexcused absences.
- **Homework and In-Class Assignments:** Some assignments will be performed in class, and will be due at the end of class. Deadlines for handing in homework will be announced when assigned. In the final grade calculation, each homework assignment will be weighted equally. Reports for "group assignments" will list the names of all group members and include a brief explanation of each member's involvement. Any writing assignments must be typed, clearly written, and properly referenced (to be discussed in class). All calculations, graphs, and other quantitative short answers may be completed by hand, but presented in a clear, logical, and step-by-step manner; otherwise no partial credit. In most cases assignments will be submitted through Blackboard.
- **Semester Project:** Students are required to complete a focused project that involves formulation of a geologic problem or hypothesis (or multiple working hypotheses); a quantitative solution or test of the hypothesis or analysis of data that negates a potential hypothesis; search for (with the guidance of instructors) and compile relevant data; perform the quantitative analysis; describe the outcomes of that analysis test, including error estimates and consideration of alternative models; and compile all results in a report that will be presented to the class in a "symposium" at the end of the term.

Other Course Policies

- *Lectures*: Class periods will involve a variety of learning activities and discussion, including PowerPoint, worked examples, regular use of videos and dedicated web sites. If it helps to convey meaning, various diagrams may also be drawn on the board to supplement the PowerPoint notes. **I do not take attendance or give credit for attendance**!

- *Absences*: Note that the following are acceptable reasons for excused absences under University of Kentucky Senate Rules (S.R.): (1) serious illness; (2) illness or death of family member; (3) University-related trips (S.R. 5.2.4.2.C); (4) major religious holidays; (5) other circumstances that the instructor finds to be "reasonable cause for nonattendance." Detailed rule explanations are at *http://www.uky.edu/Ombud/policies.php and http://www.uky.edu/StudentAffairs/Code/part2.html*. The burden of proof for verification of an excused absence is on the student, and the instructor retains the right to ask for sufficient documentation. It is preferable to notify the instructor in advance of any planned absences. If you do not notify the instructor prior to your absence, you must do so within one week (S.R. 5.2.4.2.D). When there is an excused absence, the student will be given the opportunity to make up missed work and/or exams. No opportunity will be given the opportunity to make up missed work and/or exams in the event of an unexcused absence. *Inform the instructor ahead of time if you KNOW you will be absent*. The best policy is to communicate early with the instructor: most often they will give you the benefit of the doubt. But **NO LAME EXCUSES** (parking, traffic, missed bus, etc. HOWEVER: earthquakes, tsunamis, volcanic eruptions, and meteorite impacts that affect the Lexington area constitute legitimate excuses).

  Make-up exams, in-class exercises, and quizzes: for those with a legitimate excuse: one make-up exam period will be scheduled on a day after the exam. STUDENTS ARE RESPONSIBLE FOR NOTIFYING THE INSTRUCTOR AND SCHEDULING THE MAKEUP EXAM WITHIN A WEEK OF THE MISSED EXAM.

- *Late work:* Late assignments will not be accepted and students will be given a zero, unless an excused absence prevented the student from turning the assignment in on time.

- *Cheating and Plagiarism*: Cheating and plagiarism are unacceptable. Cheating and plagiarism, and how cases of it are defined on p. 169-182 in the University Senate rules and regulations: http://www.uky.edu/Faculty/Senate/rules_regulations/index.htm

  In the unlikely event that an occurrence of cheating or plagiarism occurs, it will be dealt with according to University Senate rules and regulations: For a class such as this, where group interaction is encouraged for specific exercises, it is often difficult for students to discern what constitutes cheating for copying another student's work. We will make clear which assignments are individual exercises. **All quizzes and exams constitute individual work and instances of cheating will be pursued following Senate guidelines.**

- *Academic Accommodations due to disability:* If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (Suite 407, Multidisciplinary Science Building, 257-2754, email address: dtbeac1@uky.edu) for coordination of campus disability services available to students with disabilities.

- *Course Policy on Classroom civility and decorum:* The university, college and department have a commitment to respect the dignity of all and to value differences among members of our academic community. There exists the role of discussion and debate in academic discovery and the right of all to respectfully disagree from time-to-time. Students clearly have the right to take reasoned exception and to voice opinions contrary to those offered by the instructor and/or other students (S.R. 6.1.2). Equally, a faculty member has the right -- and the responsibility -- to ensure that all academic discourse occurs in a context characterized by respect and civility. Obviously, the accepted level of civility would not include attacks of a personal nature or statements denigrating another on the basis of race, sex, religion, sexual orientation, age, national/regional origin or other such irrelevant factors.

Keys to a Strong Performance in EES 151 Earth Dynamics

1. **Attendance is crucial!** Knowing what's going on is a simple way to good grades.
2. **Reading is crucial**! Classes are only 50 minutes in length and packed with activities, so we will not have time to cover all the core content during lecture. Read assignments before class and review your notes after class. Your comprehension of the material will improve if you read the assigned material and any handouts before class.
3. Be prepared for the upcoming class by checking the syllabus.
4. Complete and submit assignments on-time!
5. **Come to class on time and stay for the entire period**. If you have to leave early, please let me know at the beginning of class.
6. Pay attention and ask questions (in lecture, during office hours [mine and your TA's], via e-mail).
7. Take good notes – **MEANING: write down everything that the instructor says or writes on the board!** Review-revise-rewrite those notes as soon as you can after class.
8. Know the lingo: every science has a vocabulary and while we'll try to keep the terms to a minimum, you need to speak the language to some extent.
9. Find someone to study with who is committed to doing well.
10. Pay attention to the news of the world via TV, the internet, and print media.
11. If you are even slightly concerned about your performance in the course, see me immediately.

Earth Dynamics Class Schedule Fall 2011(subject to modification in the event of school closures)

	Day	Topic	Reading (Wikipedia topic)	In Class Act/HW	Other
Aug	24W	**Introduction**			
	26F	S	Syllabus Scientific notation	Scientific notation and orders of magnitude	Toilet paper exercise
	29M	Earth Structure I	Earth Structure of the Earth	Density of Core	
	31W	Earth Structure			Quiz 1: syllabus
Sept	2F	Earth Structure II	Seismic Waves		
	5M	**Labor Day: no class**			
	7W	Rock Types	Igneous; sedimentary; metamorphic; rock cycle		
	9F	Earth's Heat Engine I	Periodic Table of Elements Radioactive Decay	Half lives	
	12M	Earth's Heat Engine II			
	14W	Age calculations			Quiz 2
	16F	Earth Time I	Geochronology		
	19M	Earth Time II	Linear Regression		
	21W	Exam Preview			
	23F	**Exam #1**			
	26M	Earth Time III	Isochron dating	Isochrons	
	28W	Oldest Rocks on Earth			Quiz 3
	30F	Earth's Magnetic Field I	Earth's Magnetic Field		
Oct	3M	Earth's Magnetic Field II	Magnetostratigraphy		
	5W	Plate Velocity	Hawaiian island track		
	7F	Plate Tectonics	Plate Tectonics		
	10M	Plate Tectonics	Sea Floor Spreading		
	12W	Sea Floor Spreading			Quiz 4
	14F	Plate Tectonics	Mantle Convection		**Fall Midterm**
	17M	Earthquakes I	Faults; Elastic-Rebound Theory	EQ distribution	
	19W	Earthquake Monitoring	IRIS, USGS websites		
	21F	**Exam #2**			
	24M	Earthquakes II	Earthquake Magnitude Scales	Magnitude-Energy	
	26W	Epicenter Calculation			Quiz 5
	28F	Earthquakes III	Earthquake Prediction	Probability-frequency	
	31M	Volcanoes	Volcano		
Nov	W2	Volcano Monitoring	VEPP and other websites		
	F4*	Volcanic Eruptions		Volcano Monitoring	
	M7	**Project Introduction**	**Setup Project Groups**	**Project Topics**	
	W9	Volcano Monitoring	VEPP and other websites		Quiz 6
	F11				
	M14	Symposium Preparation			
	W16	Symposium Preparation			
	F18	Symposium Session I			
	M21	Symposium Session II		Work session	
	W23	**Academic Holiday**			
	F25	**Academic Holiday**			
	M28	Earth's Ice Ages	Glacier		
	W30				Quiz 7
Dec	F2	**Exam #3**			
	M5	Earth's Ice Ages			
	W7	TBA			
	F9	Course Review		Final exam practice problems	
	F16	******Comprehensive Final Exam Rm. 303 Slone 8 a.m.*****			

Important/Useful/Interesting Web Sites for Students

U.S. Geological Survey: www.usgs.gov

U.S.G.S. Earthquake site: http://earthquake.usgs.gov/

U.S.G.S. Hawaiian Volcanoes Observatory: http://hvo.wr.usgs.gov/

Advanced National Seismic Network: http://earthquake.usgs.gov/monitoring/anss/

IRIS (Incorporated Research Institutions for Seismology): www.iris.edu/hq]

National Science Foundation EarthScope: http://www.earthscope.org/

Kentucky Geological Survey Seismic Hazards Section http://www.uky.edu/KGS/geologichazards/index.htm

Smithsonian Institution Global Volcanism Project: http://www.volcano.si.edu/index.cfm

Free Map Tools: www.freemaptools.com

Mathworld: http://mathworld.wolfram.com/topics/Trigonometry.html

Math Skills Review: http://www.chem.tamu.edu/class/fyp/mathrev/mr-scnot.html

Math Skills Review: http://www.chem.tamu.edu/class/fyp/mathrev/mr-da.html

Math Skills Review: http://www.chem.tamu.edu/class/fyp/mathrev/mr-expnt.html

Math Skills Review: http://www.chem.tamu.edu/class/fyp/mathrev/mr-log.html

Math Skills Review: http://www.chem.tamu.edu/class/fyp/mathrev/mr-sigfg.html

Scale of the Universe: http://www.newgrounds.com/portal/view/525347

U.S.G.S. Plate Tectonic Animations: http://www.nature.nps.gov/geology/usgsnps/animate/pltecan.html

Exploring Earth Visualizations: http://www.classzone.com/books/earth_science/terc/navigation/visualization.cfm

Paleomap Project: http://www.scotese.com/Default.htm

SERC Visualizations: http://serc.carleton.edu/NAGTWorkshops/visualization/collections.html

SERC Deep Earth: http://serc.carleton.edu/NAGTWorkshops/deepearth/visualizations/mantle_conv.html

Cal Tech Mantle Dynamics: http://www.gps.caltech.edu/~gurnis/Movies/movies-more.html

Scales of Ten: http://htwins.net/scale2/scale2.swf?bordercolor=white