SIGNATURE ROUTING LOG

General Information:

Proposal Type: Course ☒ Program ☐ Other ☐

Proposal Name[1] (course prefix & number, pgm major & degree, etc.): GLY 151 (new crs, gen ed qf)

Proposal Contact Person Name: David Moecher Phone: 7-6939 Email: moker@uky.edu

INSTRUCTIONS:
Identify the groups or individuals reviewing the proposal; note the date of approval; offer a contact person for each entry; and obtain signature of person authorized to report approval.

Internal College Approvals and Course Cross-listing Approvals:

12/14/10 rec'd

Reviewing Group	Date Approved	Contact Person (name/phone/email)	Signature
Earth & Environmental Science, DUS or DGS	11/01/10	David Moecher / 7-6939 / moker@uky.edu	
Earth & Environmental Science, Chair	11/02/10	Dhananjay Ravat / 7-4726 / dhananjay.ravat@uky.edu	
		/ /	
		/ /	
A&S Ed. Policy Cmte. A&S Dean	12/07/10	G. Murthy, Nat. Sci. / 7-4729 / ganpathy.murthy@uky.edu Anna Bosch, Associate Dean / 7-6689 / bosch@uky.edu	

External-to-College Approvals:

Council	Date Approved	Signature	Approval of Revision[2]
Undergraduate Council	1/18/2012	Sharon Gill	
Graduate Council			
Health Care Colleges Council			
Senate Council Approval		University Senate Approval	

Comments:

[1] Proposal name used here must match name entered on corresponding course or program form.
[2] Councils use this space to indicate approval of revisions made subsequent to that council's approval, if deemed necessary by the revising council.

NEW COURSE FORM

1. General Information.

a. Submitted by the College of: Arts & Sciences Today's Date: Nov. 15, 2010

b. Department/Division: Earth and Environmental Sciences

c. Contact person name: David Moecher Email: moker@uky.edu Phone: 257-6939

d. Requested Effective Date: ☐ Semester following approval OR ☐ Specific Term/Year[1] : _____

2. Designation and Description of Proposed Course.

a. Prefix and Number: GLY 151

b. Full Title: Earth Dynamics

c. Transcript Title (if full title is more than 40 characters): _____

d. To be Cross-Listed[2] with (Prefix and Number): _____

e. Courses must be described by at least one of the meeting patterns below. Include number of actual contact hours[3] for each meeting pattern type.

3 Lecture _____ Laboratory[1] _____ Recitation _____ Discussion _____ Indep. Study

_____ Clinical _____ Colloquium _____ Practicum _____ Research _____ Residency

_____ Seminar _____ Studio _____ Other – Please explain: _____

f. Identify a grading system: ☒ Letter (A, B, C, etc.) ☐ Pass/Fail

g. Number of credits: 3

h. Is this course repeatable for additional credit? YES ☐ NO ☒

If YES: Maximum number of credit hours: _____

If YES: Will this course allow multiple registrations during the same semester? YES ☐ NO ☒

i. Course Description for Bulletin: A basic problem solving approach to quantifying and predicting how Earth changes through time. Involves application of math skills of sufficient level for UK admission. Satisfies the General Education Quantitative Reasoning requirement; no prerequisites.

j. Prerequisites, if any: _____

k. Will this course also be offered through Distance Learning? YES[4] ☐ NO ☒

l. Supplementary teaching component, if any: ☐ Community-Based Experience ☐ Service Learning ☐ Both

3. Will this course be taught off campus? YES ☐ NO ☒

4. Frequency of Course Offering.

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[1] Courses are typically made effective for the semester following approval. No course will be made effective until all approvals are received.

[2] The chair of the cross-listing department must sign off on the Signature Routing Log.

[3] In general, undergraduate courses are developed on the principle that one semester hour of credit represents one hour of classroom meeting per week for a semester, exclusive of any laboratory meeting. Laboratory meeting, generally, represents at least two hours per week for a semester for one credit hour. (from *SR 5.2.1*)

[4] You must *also* submit the Distance Learning Form in order for the proposed course to be considered for DL delivery.

NEW COURSE FORM

a. Course will be offered (check all that apply): ☒ Fall ☒ Spring ☐ Summer

b. Will the course be offered every year? YES ☒ NO ☐

If NO, explain: _____

5. Are facilities and personnel necessary for the proposed new course available? YES ☒ NO ☐

If NO, explain: _____

6. What enrollment (per section per semester) may reasonably be expected? 100

7. Anticipated Student Demand.

a. Will this course serve students primarily within the degree program? YES ☐ NO ☒

b. Will it be of interest to a significant number of students outside the degree pgm? YES ☒ NO ☐

If YES, explain: Proposed to satisfy GenEd Quantitative Reasoning requirement

8. Check the category most applicable to this course:

☐ Traditional – Offered in Corresponding Departments at Universities Elsewhere

☒ Relatively New – Now Being Widely Established

☐ Not Yet Found in Many (or Any) Other Universities

9. Course Relationship to Program(s).

a. Is this course part of a proposed new program? YES ☒ NO ☐

If YES, name the proposed new program: General Education

b. Will this course be a new requirement[5] for ANY program? YES ☒ NO ☐

If YES[5], list affected programs: General Education

10. Information to be Placed on Syllabus.

a. Is the course 400G or 500? YES ☐ NO ☒

If YES, the *differentiation for undergraduate and graduate students must be included* in the information required in ***10.b***. You must include: (i) identification of additional assignments by the graduate students; and/or (ii) establishment of different grading criteria in the course for graduate students. (See *SR 3.1.4.*)

b. ☐ The syllabus, including course description, student learning outcomes, and grading policies (and 400G-/500-level grading differentiation if applicable, from ***10.a*** above) are attached.

[5] In order to change a program, a program change form must also be submitted.

General Education Course Approval Cover Sheet

Date of Submission November/15/2010

1. Check which area(s) this course applies to

Inquiry – Arts & Creativity	☐	Composition & Communications - II	☐
Inquiry – Humanities	☐	Quantitative Foundations	☒
Inquiry – Nat/Math/Phys Sci	☐	Statistical Inferential Reasoning	☐
Inquiry – Social Sciences	☐	U.S. Citizenship, Community, Diversity	☐
Composition & Communications - I	☐	Global Dynamics	☐

2. Provide Course and Department Information.

Department: Earth & Environmental Science

Course Prefix and Number: GLY 151 Credit hours: 3

Course Title: Dynamic Earth

Expected # of Students per Calendar Yr: 200

Course Required for Majors in your Program (check one)? Yes ☐ No ☒

Prerequisite(s) for Course? None

This request is for (check one) A New Course ☒ An Existing Course ☐

Departmental Contact Information

Name: David Moecher, Associate Professor Email: moker@uky.edu

Office Address: 304 Slone Bldg. Phone: 257-6939

3. In addition to this form, the following must be submitted for consideration:

- A syllabus that conforms to the Senate Syllabi Guidelines, including a mapping of the stated learning outcomes to those presented on the corresponding Course Template.
- A completed Course Review Form. See the Gen Ed website http://www.uky.edu/gened/forms.html for these forms. Proposals prepared prior to September 15th, 2010 are allowed to use a narrative instead of the Course Review Form.
- If applicable, a major course change form for revision of an existing course, or a new course form for a new course.

4. Signatures

Department Chair: Dhananjay Ravat Digitally signed by Dhananjay Ravat DN: cn=Dhananjay Ravat, o=University of Kentucky, ou=DEES, email=dhananjay.ravat@uky.edu, c=US Date: 2010.11.17 11:02:31 -05'00' Date: _____

Dean: _____ Date: 12/7/10

All proposals are to be submitted from the College Dean's Office
Submission is by way of the General Education website http://www.uky.edu/gened

Course Review Form
Quantitative Foundations

Reviewer Recommendation
Accept ☐ Revisions Needed ☐

Course: GLY 151

Using the course syllabus as a reference, identify when and how the following learning outcomes are addressed in the course. Since learning outcomes will likely be addressed multiple ways within the same syllabus, please identify a representative example (or examples) for each outcome.

☐ 1. Students must demonstrate proficiency with number sense (e.g., order of magnitude, estimation, comparisons, effect of operations)

Date/location on syllabus or assignment:
Topics 1 and 2

Brief Description:
Geologic processes occur at spatial scales from the nanometer to 1000's kilometers and time scales of seconds to billions of years. Using various physical models of earth materials (crystal structures), diagrams (cross sections of earth), geologic maps at various scales and the geologic time scale, students will calculate and compare relative rates of earth processes (plate movement, earthquake rupture, frequency of volcanic eruption).

☐ 2. Students must demonstrate proficiency with functional relationships between two or more sets of variable values (i.e., when one or more variables depend upon, or are functions of, other variables)

Date/location on syllabus or assignment:
Topic 4 Push and Pull: Forces on Earth

Brief Description:
Most terrestrial processes can be explained in terms of simple forces: buoyancy, stress, rock strength, viscosity. The latter are functions of rock density, depth in the lithosphere, temperature and relative volume of rock masses. Students will calculate net vertical forces for crust and magma using basic equations for buoyancy, which is a function of rock and magma volume, density, gravity, and depth.

☐ 3. Students must demonstrate proficiency in relating different representations of such relations (e.g., algebraically or symbolically, as tables of values, as graphs, and verbally)

Date/location on syllabus or assignment:
Topic 4: Push and Pull Forces on Earth

Brief Description:
For the exercise in 2 above, students will calculate the buoyancy force for different values of crustal and magma density, calculate buoyancy of common objects (beach ball, ice cube) in water or air (e.g., helium ballon), tabulate the results to compare values visually, plot (using Excel) buoyancy as a function of density difference/relative volume, and then submit a written summary of the results of these calculations that includes the plot explaining the results of their analysis.

☐ 4. Students must demonstrate understanding of relations between numerical values.

Date/location on syllabus or assignment:
Topic 5: Seismicity and Earthquakes

Brief Description:
The earthquake magnitude scale is a logarithmic energy scale. The magnitude is a simple function of fault displacement, which can be measured on the ground. Students will compile, from on-line sources, data from historical earthquakes of measured magnitudes/displacement and convert those to absolute energy to compare the difference between earthquakes of different magnitude. The calculated magnitudes will then be compared to the Mercalli intenstiy scale, a qualitative scale based on observed impacts as reported by humans who experienced the event.

☐ 5. Students must demonstrate that they can apply fundamental elements of mathematical, logical, or statistical knowledge to model and solve problems drawn from real life.

a) Students must be able to recast and formulate everyday problems into appropriate mathematical or logistical systems, represent those problems symbolically, and express them visually or verbally.

Date/location on syllabus or assignment:
Topic 5 Seismicity and Earthquakes

Brief Description:
Consideration of the 'likelihood' (probability) of natural disasters is rarely factored into individual decisions of where to live (although insurance companies do so as a matter of policy). However, the frequency and magnitude of earthquakes is easily quantified from published earthquake data for anywhere on Earth (i.e., "I would be willing to live in Denver: although the likelihood of an earthquake is high, earthquakes are usually of low magnitude".). As part of the section on seismicity and earthquakes, students will determine the relative likelihood of damaging (M > 5) earthquakes for major American cities.

b) Students must be able to apply the rules, procedures, and techniques of appropriate deductive systems to analyze and solve problems.

Date/location on syllabus or assignment:
Semester Project (top p. 3)

Brief Description:
The method of Multiple Working Hypotheses is explicitly or emplicity applied to many problems in earth science. Empirical evidence, as it accumulates, or quantitative tests, result in negation of competing hypotheses. Students will employ this methodology in their semester project.

c) Students must be able to apply correct methods of argument and proof to validate (or invalidate) their analyses, confirm their results, and to consider alternative solutions.

Date/location on syllabus or assignment:
Semester Project

Brief Description:
Students will formulate a problem or hypothesis as part of their semester small group project. They will be required to propose appropriate tests of the hypothesis and critically evaluate the outcome of the tests.

d) Students must be able to interpret and communicate their results in various forms, including in writing and speech, graphically and numerically.

Date/location on syllabus or assignment:
In-class assignments and homework

Brief Description:
In most in-class assignments students will be required to prepare a written report individually or as a group presenting the results of their calculation; on occasion student groups will be selected to display results of graphical calculations done in Excel, e.g., via video projector.

e) Students must be able to identify and evaluate arguments that contain erroneous or fallacious reasoning, and detect/describe the limitations of particular models or misinterpretations of data, graphs, and descriptive statistics.

Date/location on syllabus or assignment:
Topic 2 Time

Brief Description:
Creation "Science" states that the earth is approximately 6000 years old. The basis for this assertion will be discussed. The methods of quantitative geochronology will be discussed and students will use real data to calculate the age of various geologic features and the age of the earth.

f) Students must address Information Literacy as presented within curriculum for the science of quantitative reasoning. This involves problem solving, the use of estimation, thinking strategies for basic facts, formulating and investigating questions from problem situations, use of computers and calculators, or other technologies.

Date/location on syllabus or assignment:
All Topics covered

Brief Description:
As a whole, the various Topics that will serve as the basis for course content will involve all the aspects listed above for attainment of Information Literacy.

☐ At least 30% of the course addresses the items 1 – 4 on this checklist, and at least 40% of the course addresses items 5 a) – e) on the checklist.

Reviewer's Comments

GLY 151 new gen ed - QF

University Senate Syllabi Guidelines

General Course Information

- ☑ Full and accurate title of the course.
- ☑ Departmental and college prefix.
- ☑ Course prefix, number and section number.
- ☑ Scheduled meeting day(s), time and place.

Instructor Contact Information (if specific details are unknown, "TBA" is acceptable for one or more fields)

- ☑ Instructor name.
- ☑ Contact information for teaching/graduate assistant, etc.
- ☑ Preferred method for reaching instructor.
- ☑ Office phone number.
- ☑ Office address.
- ☑ UK email address.
- ☑ Times of regularly scheduled office hours and if prior appointment is required.

Course Description

- ☑ Reasonably detailed overview of the course.
- ☑ Student learning outcomes.
- ☑ Course goals/objectives.
- ☑ Required materials (textbook, lab materials, etc.).
- ☑ Outline of the content, which must conform to the Bulletin description.
- ☑ Summary description of the components that contribute to the determination of course grade.
- ☑ Tentative course schedule that clarifies topics, specifies assignment due dates, examination date(s).
- ☐ Final examination information: date, time, duration and location.
- ☑ For 100-, 200-, 300-, 400-, 400G- and 500-level courses, numerical grading scale and relationship to letter grades for *undergraduate* students.
- NA ☐ For 400G-, 500-, 600- and 700-level courses, numerical grading scale and relationship to letter grades for *graduate* students. (Graduate students cannot receive a "D" grade.)
- ☑ Relative value given to each activity in the calculation of course grades (Midterm=30%; Term Project=20%, etc.).
- ☑ Note that undergraduate students will be provided with a Midterm Evaluation (by the midterm date) of course performance based on criteria in syllabus.
- ☑ Policy on academic accommodations due to disability. Standard language is below:

  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 (Room 2, Alumni Gym, 257-2754, email address jkarnes@email.uky.edu) for coordination of campus disability services available to students with disabilities.

Course Policies

- ☑ Attendance.
- ☑ Excused absences.
- ☑ Make-up opportunities.
- ☑ Verification of absences.
- ☑ Submission of assignments.
- ☑ Academic integrity, cheating & plagiarism.
- ☑ Classroom behavior, decorum and civility.
- NA ☐ Professional preparations.
- NA ☐ Group work & student collaboration.

checked by: ZH

GLY 151: Dynamic Earth

A Course in Quantitative Reasoning

University of Kentucky, Dept. of Earth and Environmental Sciences,
Fall Semester, 2011: 3 Credit Hours
Course Website — on BlackBoard (TBA)

The theory of plate tectonics revolutionized our understanding of how Earth works and has 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. This course satisfies the UK General Education Quantitative Foundations requirement.

[**Bulletin Description**: A basic problem solving approach to quantifying and predicting how Earth has changed through time. Involves application of math skills of sufficient level for UK admission. Satisfies the General Education Quantitative Reasoning requirement; no prerequisites.]

Prerequisite: Although there are no UK prerequisites, it is assumed that students will enter the course with the same background necessary for taking MA 109 (College Algebra): an appropriate mastery of high school mathematics through Algebra I, Algebra II, and Geometry to earn a Math ACTE score of at least 19, or the equivalent. This course satisfies the General Education Quantitative Foundations requirement, but it is NOT a prerequisite for any other course at UK requiring appropriate math proficiency.

Learning Outcomes

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

1. Demonstrate proficiency with number sense and with functional relationships between two or more sets of variables; compare different representations of those relations algebraically, symbolically, in tables, using graphs, and verbally.

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

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

4. Apply the correct methods of argument and proof to test analyses, 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.

Instructor
Dr. David Moecher, Associate Professor (www.as.uky.edu/ees/faculty/moecher).
Office: 304 Slone Building; office phone: 859-257-6939; e-mail: moker@uky.edu
Office Hours: MW 2-3 p.m. or by appointment, or whenever I am in my office-just knock!

Teaching Assistants
Ms. Valerie Volcano and Mr. Earnest Earthquake
Office: 305A Slone Building; e-mail: TBA; Office Hours: TR 9-10 a.m.

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

Course Materials: *Global Tectonics* 3rd Edition, by P. Kearey, K. Klepeis, and F. Vine, Wiley-Blackwell, 2009. In addition to daily use of the textbook, we will use numerous on-line resources and web sites, and maps and diagrams provided by the instructor. If you have a laptop, iPad, or other device that can access the internet, bring it to class. 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. Laptop PCs with Microsoft Office ® will be provided for students to use in class.

What will we do in this class? All UK students are required to take a course that satisfies the General Education/Quantitative Reasoning requirement. This course will develop student skills in algebra, geometry, and trigonometry with applications in plate tectonic processes and dynamic evolution of the earth.

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 daily basis to be involved in completing individual and 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, and floods)

Grading, Exams, and Assignments

- *Overall grade components*: Exams (3 during term and final) = 40%; homework 50%; project = 10%
- *Overall grading*: $\geq$ 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. Material from reading assignments in the text that was not covered in lecture or homework will not appear on the exam. Lecture notes will be related to the textbook, but supplemental handout material not in the textbook will also be discussed in class.
- **Homework and In-Class Assignments:** Some assignments will be performed in class, and will be due at the end of class. Weekly homework will be due one (1) week from the day they are assigned (see class schedule for assignment and due dates). 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. If required, you can also view the detailed PowerPoint slides (text + figures) during TA office hours.

- *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.

- *Cheating and Plagiarism*: In the unlikely event that an occurrence of cheating or plagiarism occurs, it will be dealt with according to *http://www.uky.edu/USC/New/rules_regulations/index.htm*.

- *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 (Room 2, Alumni Gym, 257-2754, email address jkarnes@eamil.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 GLY 151 Dynamic Earth:

1. Read chapters before class and review your notes. Your comprehension of the material will be better if you read the assigned sections in the textbook and any handouts before class.
2. Be prepared for the upcoming class by checking the syllabus.

3. Complete and submit assignments on-time!
4. **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.
5. Pay attention and ask questions (in lecture, during office hours [mine and your TA's], via e-mail).
6. Take good notes.
7. Know what the terms mean. 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.
8. Find someone to study with who is committed to doing well.
9. Read or listen to the news.
10. If you are at all concerned about how the course is going, see me immediately.

Potential Topics and Methods (included as examples; specific topics, schedule, and mechanics for first offering in the Fall 2011 term will be finalized by Moecher during the summer of 2011)

Major Topic	Quantitative Concepts, Methods and Applications		
1. Earth structure: 2D and 3D relations on and in Earth	Absolute and relative distance; scale and ratio; volume; direction; coordinate systems; angular relations; slope	Describing and quantifying spatial distributions of terrestrial processes and features.	Basic functional relations and calculations; plotting distributions
2. Time: the 4th Dimension	Time systems and scales; geologic time; relative and absolute time; half life and decay constants	Calculating the age of the Earth from published data; timing of major earth events	Exponents; linear regression; isochrons
3. Plates and Rates	Plate velocity, gradients, rates of terrestrial and planetary processes, direction, rotation, uplift and subsidence rates, fault displacement rates	Quantifying present plate motion rates; comparison of calculated and measured (GPS) velocity determinations	Basic functional relations and calculations
4. Push and Pull: Forces in Earth	Force, gravity, density, stress/pressure, buoyancy, isostasy, rock strength	Rock/crust failure conditions, elasticity, viscosity, mantle flow	Basic functional relations and calculations
5. Seismicity and Earthquakes	Energy/intensity scales; magnitude –frequency relations	Epicentral location calculation; spatial (X-Y-depth) distribution of earthquakes in Earth	Logarithms; probability distributions; graphical analysis
6. Volcanoes and Magma	Magma composition, eruption volumes, eruption frequency/periodicity	Density, viscosity, buoyancy of magma	
7. The Earth Heat Engine	Temperature, heat flow mechanisms, heat flow rates, heat generation	Thermal conductivity, geothermal gradients,	
8. Earth's Magnetic Field	Magnetic field polarity and strength	Sea floor spreading, magnetic stratigraphy, correlation	
9. Oceans, coasts, and climate	Temperature proxies; shoreline configurations; ocean volume	Sea level fluctuation, shore line position shifts,	
10. Glaciers and Rivers: Sculpting Earth's Surface		Erosion and sediment production rates; depositional rates; stream patterns	
Mid-term evaluation Final exam	Date TBD Date TBD		

Mid-term Grade (for 100-400 level courses, and for undergraduates in 500 level courses)

Mid-term grades will be posted in myUK by the deadline established in the Academic Calendar (http://www.uky.edu/Registrar/AcademicCalendar.htm)

Academic Integrity (boilerplate):

Per university policy, students shall not plagiarize, cheat, or falsify or misuse academic records. Students are expected to adhere to University policy on cheating and plagiarism in all courses. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the university may be imposed.

Plagiarism and cheating are serious breaches of academic conduct. Each student is advised to become familiar with the various forms of academic dishonesty as explained in the Code of Student Rights and Responsibilities. Complete information can be found at the following website: http://www.uky.edu/Ombud. A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty. It is important that you review this information as all ideas borrowed from others need to be properly credited.

Part II of *Student Rights and Responsibilities* (available online http://www.uky.edu/StudentAffairs/Code/part2.html) states that all academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about the question of plagiarism involving their own work, they are obliged to consult their instructors on the matter before submission.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording or anything else from another source without appropriate acknowledgement of the fact, the students are guilty of plagiarism. Plagiarism includes reproducing someone else's work, whether it be a published article, chapter of a book, a paper from a friend or some file, or something similar to this. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work which a student submits as his/her own, whoever that other person may be.

Students may discuss assignments among themselves or with an instructor or tutor, but when the actual work is done, it must be done by the student, and the student alone. When a student's assignment involves research in outside sources of information, the student must carefully acknowledge exactly what, where and how he/she employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making

simple changes while leaving the organization, content and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas which are so generally and freely circulated as to be a part of the public domain (Section 6.3.1).

Please note: Any assignment you turn in may be submitted to an electronic database to check for plagiarism.