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## POLICY STATEMENT

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**Missouri State University**

DEPARTMENT OF GEOGRAPHY,  
GEOLOGY AND PLANNING

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**GRY 142: Introduction to Physical Geography**  
**Section: A MWF 10:45 - 11:35 a.m.**  
**(Temple Hall 0003)**

**Dr. Mario Daoust**  
**Office:** Temple 367A  
**Phone:** 836-5301  
**e-mail:** MarioDaoust@missouristate.edu

**Office Hours:** MW 2:00 - 4:00  
F 1:00 - 2:00  
or by appointment

**Fall 2013**

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### **CATALOG DESCRIPTION:**

#### **GRY142 Introduction to Physical Geography. 4 (3-2) F, S**

General Education Course (Natural World). A study of the earth's natural systems including weather and climate, rocks and minerals, landforms and processes of landform development, biogeography, water resources and soils. Map fundamentals and the interrelationships of the geographic factors of the natural environment are emphasized. Students who take GRY 240 and GRY 142 may receive credit for only one of these courses.

#### **Required Textbook:**

Christopherson, R.W., (2012). Geosystems: An Introduction to Physical Geography, 8<sup>th</sup> Edition, Pearson/Prentice-Hall, 688p.

*This textbook is a reference manual for the course. The lectures presented in class will be based on several textbooks and on material from other sources. **It is essential that you take notes during the lectures.***

#### **Course Objectives:**

The main purpose of this course is to explore the physical environment of the earth and the interactions within and between the atmosphere, the hydrosphere, the lithosphere and the biosphere. Using a system approach, this course establishes the links between process, form, and effect. At the end of this course, students should be able to look at the natural world as a series of systems, comprehend the relationship between the different physical components of the earth, and understand the vital role played by the flows of matter and energy in this global environmental system.

## **GENERAL EDUCATION LEARNING GOALS AND RATIONALES**

GRY 142 is a General Education course sanctioned by the Committee on General Education and Intercollegiate Programs (CGEIP). Following the General Education structure, GRY 142 is a *Breath of Knowledge* course. This is a *Knowledge of the Natural World* course, with a focus on *Physical Sciences*.

### **CGEIP - Knowledge of the Natural World – General Learning Goals for GRY 142**

**Rationale:** GRY 142 introduces students to the physical realms of the Earth: atmosphere, hydrosphere, lithosphere and biosphere. This course increases the degree of awareness of students to Earth's physical environment, exposes the complex interconnectedness between each physical component governing planet Earth, and allows students to develop a well informed, open-minded critical approach on matters relevant to physical geography. GRY 142 introduces students to the cyclical nature of geosystems and their interpretation. Past environmental changes are explored, and specific contemporary environmental problems are analyzed.

### **CGEIP - Knowledge of the Natural World – Specific Learning Goals (SLG) for GRY 142**

#### **CGEIP Specific Learning Goals 1, 3 and 5 (Physical Sciences) are met by GRY 142**

**SLG#1. *Demonstrate Knowledge of the physical universe (in this case, Planet Earth) including its origin and the physical processes.*** GRY 142 examines each physical realm of the Earth: atmosphere, hydrosphere, lithosphere and biosphere. This includes: energy-atmosphere system, global temperatures, atmospheric moisture and cloud development, synoptic weather and global climate systems, water resources, fluvial systems, tectonics, earthquakes and volcanism, weathering and mass movement, soils, environmental systems and biomes. Origin and physical transformations of the Earth through time is explored, and current global environmental changes are discussed.

**SLG#3. *Develop knowledge and principles of the physical world (in this case, Planet Earth) through hypothesis testing and gain the ability to draw defensible conclusions regarding the physical world.*** GRY 142 allows the general education student to learn relevant quantitative methods used by physical geographers to explore and model the phenomena they observe (e.g., climograph, soil water budget, etc...), and expose them to other useful tools used by physical geographers (air photo interpretation, topographic maps, GIS, etc...). To this end, lab work is aimed at increasing the degree of awareness of students to Earth's physical environment, and allows them to develop a well-informed, open-minded critical approach on matters relevant to physical geography. GRY 142 encourages students to develop their own opinions on global environmental issues based on current accepted theories and issues discussed in class.

**SLG#5. Understand the ways the environment impacts humanity and how human actions affect the environment.** GRY 142 explores the concept of global environmental change by looking at processes that shape the physical environment, both natural and human induced. Specific issues such as global warming, deforestation, and sea level rise are analyzed, and consequences on Earth’s physical realms (including human communities) are discussed. In the context of natural disasters, GRY 142 explores several major topics (earthquake, volcanism, drought, tsunami, hurricane landfall, climatic anomalies, etc...), and their impacts on human communities and the environment are examined.

**COURSE REQUIREMENTS AND EVALUATIONS**

This course has two main components: Lectures and Labs. Evaluation of your progress in this course will be done as follows:

- 1. Lectures: During the semester, you will get three tests in this Lecture Hall covering the material presented during the lectures. Each test will be worth 20% of your final grade. Tests are composed of Multiple Choice/True or False questions.

**Note:** *A study guide will be provided for each test.*

Total: **60 % of your final grade** is based on **Lecture sessions**

- 2. Labs: Lab evaluation will include tests and weekly lab assignments. A policy statement on the Lab sessions will be provided by your Lab instructor.

Total: **40% of your final grade** is based on **Lab Sessions**.

Note: Your lab instructor will give you more information on the format that will be used for the lab tests. As well, your lab instructor will explain to you the rules and grading system used for the lab assignments.

**GRADE DETERMINATION**

Your final grade will be based on:

Lecture session - Test #1 (week 5) .....	20 %
Lecture session - Test #2 (week 10).....	20 %
Lecture session - Test #3 (week 16).....	20 %
Lab Sessions .....	40%

Total: 100%

## **GRADING SYSTEM**

Letter grades will be based on the following percentages for the full term work:

A = 90.0% to 100.0%	A- = 87.0% to 89.9%	B+ = 84.0% to 86.9%
B = 80.0% to 83.9%	B- = 77.0% to 79.9%	C+ = 74.0% to 76.9%
C = 70.0% to 73.9%	C- = 67.0% to 69.9%	D+ = 64.0% to 66.9%
D = 60.0% to 63.9%	F = 0.0% to 59.9%	

## **COURSE ASSESSMENT – CGEIP**

### **Methods: Assessment Surveys and Pre-test/Post-test**

GRY 142 is a General Education course. Like every course in the General Education program, it will be assessed regularly to determine how well it is meeting the aims and goals of the General Education program.

Toward this end, you will be required to answer an **Assessment Survey and Pre-Test** in lab during the first week of the semester. During the final exam week, you will then be required to answer a second **Assessment Survey and Post-Test**. Under no circumstance will your performance on either of these assessment instruments have a negative effect on your grade in this course.

However, to give you an incentive to do as well as possible on the **comprehensive Post-Test**, we offer the option of substituting your score on this Post-Test for your score on the lowest of your first two lecture exams (e.g., test#1 or test#2). In other words, this comprehensive Post-Test cannot lower your Final Grade for this class, but it might raise your Final Grade if you do really well on it.

## **ATTENDANCE AND MAKE-UP EXAMS**

**Attendance does not play a role in the overall grading scheme.** However, statistics have demonstrated that successful students in this course are those who have a good attendance record. *If, for any reason, you know you cannot attend class regularly and on time each day, please drop the course now.*

**Note:** On a regular basis, attendance will be recorded in the main lecture room.

**Make-up exams will only be allowed if the instructor is notified of the problem prior to the class time.** Acceptable absences include university-sanctioned activities, personal illness, or family emergencies. Written verification for your absence is mandatory. **Make-up exams will not be allowed if prior notification is not given.**

## **DROPPING A CLASS**

**It is your responsibility to understand the University's procedure for dropping a class.** If you stop attending this class but do not follow proper procedure for dropping the class, you will receive a failing grade and will also be financially obligated to pay for the class. To drop a class anytime after the first week of classes, you must complete and turn in a drop slip at an authorized registration center (see <http://www.missouristate.edu/recreg/chnsched.html>). **You do not need to obtain any signatures on the drop slip.** It does not need to be signed by your instructor, your advisor, or a department head. If you wish to withdraw from the University (i.e., drop all your classes), contact the Office of the Registrar at 836-5520.

## **ACADEMIC INTEGRITY/CHEATING POLICY**

Missouri State University is a community of scholars committed to developing educated persons who accept the responsibility to practice personal and academic integrity. **You are responsible for knowing and following the university's student honor code, *Student Academic Integrity Policies and Procedures*,** available at

[www.missouristate.edu/assets/provost/AcademicIntegrityPolicyRev-1-08.pdf](http://www.missouristate.edu/assets/provost/AcademicIntegrityPolicyRev-1-08.pdf) and also available at the Reserves Desk in Meyer Library. Any student participating in any form of academic dishonesty will be subject to sanctions as described in this policy.

## **DISABILITY ACCOMODATION POLICY**

To request academic accommodations for a disability, contact the Director of Disability Services, Plaster Student Union, Suite 405, (417) 836-4192 or (417) 836-6792 (TTY), <http://www.missouristate.edu/disability>. Students are required to provide documentation of disability to Disability Services prior to receiving accommodations. Disability Services refers some types of accommodation requests to the Learning Diagnostic Clinic, which also provides diagnostic testing for learning and psychological disabilities. For information about testing, contact the Director of the Learning Diagnostic Clinic, (417) 836-4787, <http://psychology.missouristate.edu/lcdc>.

## **NON-DISCRIMINATION POLICY**

Missouri State University is an equal opportunity/affirmative action institution, and maintains a grievance procedure available to any person who believes he or she has been discriminated against. At all times, it is your right to address inquiries or concerns about possible discrimination to **the Office for Equity and Diversity**, Park Central Office Building, 117 Park Central Square, Suite 111, (417) 836-4252. Other types of concerns (i.e., concerns of an academic nature) should be discussed directly with your instructor and can also be brought to the attention of your instructor's Department Head.

## **POLICY ON USE OF CELL PHONES IN CLASS**

As a member of the learning community, each student has a responsibility to other students who are members of the community. **When cell phones or pagers ring and students respond in class or leave class to respond, it disrupts the class.** Therefore, the *Office of the Provost prohibits the use by students of cell phones, pagers, PDAs, or similar communication devices during scheduled classes. All such devices must be turned off or put in a silent (vibrate) mode and ordinarily should not be taken out during class.* Given the fact that these same communication devices are an integral part of the University's emergency notification system, an exception to this policy would occur when numerous devices activate simultaneously. When this occurs, students may consult their devices to determine if a university emergency exists. If that is not the case, the devices should be immediately returned to silent mode and put away. Other exceptions to this policy may be granted at the discretion of the instructor.

## TENTATIVE COURSE OUTLINE (LECTURES)

- Week 1-2**                    **Physical Geography: an introduction**  
Components of physical geography, history of physical geography as a science, tools used in physical geography, structure of environmental systems, flows of energy and matter, open and closed flow systems, systems equilibrium and systems feedback.
- Week 2-3**                    **The Earth: basic concepts and the geographic grid**  
The place of Planet Earth in the Universe, geocentric and heliocentric systems, the spherical earth, topography of oceanic basins and continental land masses, the geographic grid (latitude/longitude), map projections.
- Week 3**                      **Earth-Sun relationships**  
Solar output, sunspot cycle, solar constant and insolation, Earth-Sun astronomical relationships, rotation and revolution, Earth's axial tilt and seasonality
- Week 4**                      **Atmospheric composition and thermal structure**  
Chemical composition, Permanent and variable gases, Vertical thermal structure of the atmosphere: troposphere, stratosphere, mesosphere and thermosphere. Ionosphere and Auroras.
- Week 4-5**                    **Weather and Climate: a) Radiation and Air Temperature**  
Absorption, reflection and scattering of energy, albedo, earth-atmosphere energy balance, vertical heat transfers.  
Air temperature: cycles, land and water contrasts, world spatial patterns.
- Week 5**                      **Weather and Climate: b) Atmospheric Moisture**  
Humidity, relative humidity, vapor pressure, dew point temperature, saturation, condensation, etc...) adiabatic process, stable and unstable atmospheric conditions, clouds, fogs, atmospheric lifting mechanisms and precipitations
- Week 6-7**                    **Weather and Climate: c) Atmospheric Circulation**  
Scales of atmospheric circulation, Pressure gradient, Coriolis effect, frictional force on surface winds, land and sea breeze, geostrophic flow, general atmospheric circulation, ITCZ, subtropical Highs, Trade Winds and Westerlies, Polar front, index cycle (zonal and meridional flows), Upper-air westerlies and polar jet stream. Connections between atmospheric circulation and oceanic circulation (marine currents).

- Week 7-8**                      **Weather and Climate: d) Synoptic Climatology**  
 Primary and secondary air masses, frontogenesis, synoptic meteorology: stationary, cold, warm and occluded fronts, cyclones and anticyclones, cyclolysis, severe weather: thunderstorms, tornadoes, and hurricanes
- Week 8**                        **Hydrosphere: a) Water resources and the Soil water Budget**  
 Hydrologic cycle, surface water, soil water flowpath: evaporation, transpiration, runoff, infiltration, gravity percolation. Soil at field capacity, soil water cycle, Thornthwaite's soil moisture budget: actual and potential evapotranspiration, soil moisture utilization, soil moisture storage, soil moisture recharge, deficit and surplus.
- Week 9-10**                    **Hydrosphere: b) Water Surplus: subsurface and surface conditions**  
 Subsurface conditions: water table, aquifers (unconfined and confined), aquiclude, subterranean flow, overuse of groundwater, groundwater pollution.  
 Surface conditions: Overland flow, stream flow, stream gradient and velocity, stream discharge. Drainage basins: morphology, density and spatial patterns, storm hydrographs.
- Week 10**                      **Hydrosphere: c) Fluvial Processes**  
 Stream channel as a conceptual model: water flow and sediments transport. Stream erosion: hydraulic action, abrasion and corrosion. Stream transportation: dissolved load, suspended load, and bed load. Stream capacity, stream deposition: alluvial deposits, floodplains, terraces and deltas, meanders and oxbow lakes,
- Week 11**                      **Lithosphere, Rocks and Minerals**  
 Structure of the earth (core, mantle, crust), asthenosphere, oceanic and continental crust.  
 Lithification, rock properties: composition, texture, structure (bedding planes, joints cleavages), major rock forming minerals, scale of hardness (minerals). Rock types: felsic and mafic rocks, igneous rocks (intrusive and extrusive), sedimentary rocks (clastic, chemically precipitated, organic), and metamorphic rocks. Cycle of rock change.
- Week 12**                      **Tectonic System and Earthquakes**  
 Continental drift and plate tectonic theory, plate subduction, sea-floor spreading, crustal compression. Faults: reverse, transcurrent, normal, overthrust. Earthquake conditions, World seismicity, seismic waves. Earthquake magnitude and intensity, primary hazards associated with seismic events: ground shaking, fault rupture, ground failure, tsunami.



**Week 13****Volcanism**

What are active volcanoes? Location of active volcanoes, plate subduction, plate divergence, and intraplate volcanism, effusive and explosive eruptions, shield and strato-volcanoes, types of eruptions. Primary hazards associated with volcanism: lava flows, pyroclastic falls, and pyroclastic flows. Secondary hazards associated with volcanism: lahars, glacier melt, toxic gases.

**Week 14****Landscapes: Topography and Development**

Earth's crustal order of relief, landforms and landscapes. Lithification, weathering, erosion and deposition processes, Structural landforms, weathering landforms, erosional landforms, depositional landforms

**Week 14-15****Weathering**

Impacts of weathering, weathering zone, weathering agents. Physical weathering: frost action, thermal (exfoliation I), biological, salt crystal (crystallization), wetting and drying, pressure release (exfoliation II). Chemical weathering: simple dissolution, chelation, carbonation, oxidation, hydrolysis and hydration,

**Week 15-16****The Soil Layer**

Nature of a soil, physical, chemical and biological activities related to soil forming processes, soil forming factors, soil characteristics (horizons, topsoil, subsoil, solum, eluviation, illuviation). Soil properties: color, texture, structure. Soil acidity and alkalinity, Soil orders.

**Week 16****Biosphere - The Vegetation Layer**

Physical environmental factors and vegetational response, biomes, community and habitats, energy flows and material cycles.

**Note to the reviewers:**

Starting on the next page, a policy statement for the **Lab sessions** is included. This second document is distributed to the students on their first Lab session.



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## **ATTENDANCE**

Attendance is essential to succeed in this class. It will be recorded randomly at the beginning of the lab session throughout the semester. Your punctuality to class is appreciated.

## **MAKE-UP POLICY**

Make-up exams will only be allowed if the instructor is notified of the problem prior to the lab session time (or within one day of missing your lab). Acceptable absences include university-sanctioned activities, personal illness, or family emergencies. Written verification for your absence is mandatory. Make-up exams without prior instructor verification must be taken in the instructors' office within a two week period after the original test date. After the two week period, if the test has not been taken, the resulting grade will be a zero.

## **GRADING**

You will not receive an individual grade for the lab. Instead you will receive a combined lecture-lab grade (**lecture 60% & lab 40%**) determined by the lecture instructor. You will be tested over lab material on each of the three tests given in the labs. The lab portion of the three tests will be administered during weekly lab sessions.

The breakdown of the lab scores is as follows;  
25% Weekly assignments  
15% Tests

Weekly lab assignments are due by the beginning of the following week's class. Even if you were not in class for the discussion, you will have one week to complete the lab assignment. If the assignment is not turned in on time, you will have **three days** after it is due to get it submitted. A daily 25% penalty will be imposed on late assignments. Assignments will not be accepted after the third day. This will automatically result in a zero for the assignment.

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Please visit the OED website at [www.missouristate.edu/equity/](http://www.missouristate.edu/equity/).

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For information about testing, contact Dr. Steve Capps, Director, (417) 836-4787, <http://psychology.missouristate.edu/ldc>.

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**GRY 142 Fall 2013 – Tentative Lab Schedule**

<b>Date</b>	<b>Subject</b>	<b>Unit</b>
Week1	Policy Statement, Assessment Survey, Pretest	
Week2	Latitude, Longitude, and Time	1
Week3	Map Projections	3
Week4	Contours & Topographic Maps	14
Week5	Earth/Sun Relationships	4
Week6	Lab Test 1	
Week7	Temperature Patterns	5&6
Week8	Atm. Pressure and Stability	7&8
Week9	Karst Landscapes	18
Week10	Lab Test 2	
Week11	Water Budget	10
Week12	Air Photo Interpretation	
Week13	Plate Tectonics	12
Thanksgiving		
Week15	Rocks and Minerals	
Week16	LAB TEST 3	