**Workshop on: Using InTeGrate Materials in Your Classroom**

**August 28, 2015 – 2:30-4:30 PM – Geology 123**

**Introduction to InTeGrate Materials**

2:30-3:20 (Room 123)

Materials are available at:

<http://serc.carleton.edu/integrate/teaching_materials/modules_courses.html>

*What InTeGrate is and why it is different:*

Materials focus on five main topics: <http://serc.carleton.edu/integrate/teaching_materials/itg_materials_dev.html>

Contain materials for instructor, student and answer keys!

<http://serc.carleton.edu/integrate/teaching_materials/adapting.html>

Uses pedagogical methods that are proven effective and developed through a rigorous testing process. Rubric and more details you probably want can be found at:

<http://serc.carleton.edu/integrate/teaching_materials/itg_materials_dev.html>

Have clearly identified learning goals and embedded assessments.

Faculty that have used materials have shown gains in student performance and in their teaching evaluations.

(see poster outside room 307 geology)

Extensive resources to help teach material (perhaps too extensive!)

(condensed to tables you have)

*Overview of modules*

<http://serc.carleton.edu/integrate/teaching_materials/modules_courses.html>

Some of the material overlaps but has slightly different focus (gen ed classes, teacher prep classes, beyond geoscience, geoscience focused)

Some are lecture or lab based, some are on-line courses

<https://www.e-education.psu.edu/earth104/orientation/index>

Many use: Think/Pair/Share, Jigsaw, Gallery Walk

Can be overwhelming to choose from, but we’ve compiled some overviews

 (SEE ATTACHED TABLES – we will test-drive parts of Freshwater and Climate of Change modules)

Take what you want, one activity, one unit, or complete module, also on-line courses by experts

*Questions?*

3:30-4:20 (Test Drive an Activity)

*Choose an activity (El Niño or Groundwater) and move to respective rooms*

*Hands-on run through of activity*

*What to do if you decide you’d like to try InTeGrate material (SEE ATTACHED GUIDELINES)*

*Questions?*

*Interest in other workshops?*

*Evaluation of workshop*

**WHAT TO DO IF YOU WOULD LIKE TO TRY InTeGRATE MATERIALS THIS YEAR:**

**(We will be happy to help you with any stage of this process!)**

1. Tell Diane you are interested so she can include you in ongoing activities through the next 2 semesters.
2. Make a SERC account if you don’t have one – SERC contains a lot of other valuable teaching aids (website)!! And you need to do this to get access to instructor materials!

<https://serc.carleton.edu/account/loginout.php?return_url=%2Faccount%2Findex.php>

1. Register your class at the SERC website:

<http://serc.carleton.edu/integrate/info_team_members/IP/ip_course_form.html>

1. If teaching course at UTEP you will need a student consent form (copy attached).
2. Provide initial course roster to SERC website (most faculty use student ID numbers for rosters – SERC scrambles ID numbers after they are entered)
3. Administer Geoscience Literacy Questions ( GLE questions) to class at beginning and end of class. There is a link on the course status webpage to get GLE questions. You can then get a pdf file that contains the number of versions you need (all numbered with bubbles to fill in). Once you administer them you can scan them and upload the scans to the website. IF YOU NEED HELP WITH ADMINISTERING THESE ASK US FOR ASSISTANCE!
4. Ask students to complete on-line attitudinal survey at beginning and end of course. SERC will tell you who completes it and some of us give students extra credit points as incentive for completing it.
5. Keep a journal of your reflections on teaching the materials to share with SERC (and Diane).
6. Depending on which modules/activities you use Diane would like you to ask several multiple choice and reflection questions at the end of the activity (or on an exam) and pass on the results (tabulated answers or scans) to Diane.

MORE STEP-BY-STEP DETAILS CAN BE FOUND AT:

<http://serc.carleton.edu/integrate/info_team_members/IP/testing_integra.html>

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| THE DEPARTMENT OF GEOLOGICAL SCIENCESTHE UNIVERSITY OF TEXAS AT EL PASO500 W UNIVERSITYEL PASO, TX 79968-0555*PH (915)747-5501 FAX (915) 747-5073* | Centenniallogo-med.jpg |

 August 27, 2015

Dear Student,

The University of Texas at El Paso (UTEP) is teaming with Carleton College in Minnesota and other colleges/universities across the country to study undergraduate students’ understanding of geoscience and environmental science concepts.

For the purposes of this grant and to improve education in geoscience/environmental science we are studying student understanding of key aspects of Earth Science, Atmospheric Science, Climate, and Ocean literacies. You are enrolled in a course which focuses on these concepts. As such, we will be collecting demographic data about you and the responses to assessment questions that you complete for this course. Your responses will be used only by the project team to address the research questions.

College and universities across the country are interested in new methods of improving the learning of their students and how they can better prepare them for the demands they will face in the future. As part of this effort, we would like to share the results of what we find with others who are interested in geoscience education. All data we collect will be grouped and reported anonymously. In addition, your choice of whether or not to participate will not affect the grade you receive in this course.

Your name will never be linked to anything that is publicly reported. Under no circumstances will the results of any individual student be detectable if the research is published. In short, we guarantee that you will not be identified if your work is used for study.

We want to offer UTEP students the best possible education in geosciences/environmental sciences. Sharing our results with other programs and agencies helps us to determine how well we are meeting this goal at UTEP and preparing you for your future.

A decision to participate will not affect one’s course grade. Please notify \*\*\*\* in person, via email \*\*\* or by telephone \*\*\* if you do not wish to have your response data included in the study.

Sincerely,

\*\*\*

***HANDY GUIDES TO WHAT THE MODULES CONTAIN:***

***Environmental Justice and Freshwater Resources – Joshua Villalobos and Adriana Perez helped develop, has been used at UTEP and EPCC in a variety of gen. ed. Classes***

***NOTE: This set of modules is being translated into Spanish***

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| *Unit* | *Activity* | *Approx. time* | *Suited for:* |
| *1- Introduction to Environmental Justice* | *#1- People and Environment Exploration Activity*  | *10 minutes* |  *In-class discussion to get students to think about the definition of what an environment is.*  |
| *1- Introduction to Environmental Justice* | *#2- Exploring the Concept of Environmental Justice Think-Pair-Share Activity*  | *10 minutes* | *Smaller classes of 25-30 or less.*  |
| *1- Introduction to Environmental Justice* | *#3- Presentation and Discussion of the Development of the Environmental Justice Movement*  | *20 minutes* | *Large classes and for in class discussions.* |
| *1- Introduction to Environmental Justice* | *#4 Minute Paper on events or examples related to the environment and justice from the lecture so the students personally consider significant* | *10 minutes* | *Good for large classes and end of class assessment.* |
|  *2- The Hydrologic Cycle and Freshwater Resources* | *#1-Pre-Class Activity: Water Footprint where students calculate their water usage at home.*  | *15-20 minutes*  | *Good for large and small classes and online classes.*  |
|  *2- The Hydrologic Cycle and Freshwater Resources* | *#2-Hydrologic Cycle Exploration Activity asking students to think of ways in which water is present on Earth* | *15-20 minutes*  | *Good for large and small classes and online classes.*  |
|  *2- The Hydrologic Cycle and Freshwater Resources* | *#3-Sustainability Role-Play where students break into groups, representing the major mechanisms of transport while the instructor plays the role of a consumer of water and various scenarios are played out.* | *15-20 minutes*  | *Good for small classes that have longer time periods. Difficult with large groups.*  |
| *3- Streams and Water Diversion* | *#1- Google earth activity involving key concepts that students should comprehend of a drainage basin or watershed.* | *30-40 minutes depending on students fluency in GE* | *Great for smaller classes with access to computers. Larger classes can slow down internet server or Wi-Fi. Computers should be check to make sure all have GE installed.*  |
| *3- Streams and Water Diversion* | *#2- "The Four Streams" region, Hawaii activity gives the student a visual context of the physiographic features of the island of Maui and its relationship to hydrological features being discussed* | *15-20 minutes* | *Online classes and smaller face to face classes.*  |
|  | *#3- Getting the Concepts- This activity is a modified version of a Think-Pair-Share activity for students to participate in.*  | *15-20 minutes* | *Good for smaller classes in lab room setting.*  |
| *4- Women and Water* | *Pre-class Homework: Fresh Water Availability and Quality of Life using GE activity where students use GE to answer questions given in class.*  | *40 minutes* | *Students need to be broken into three groups and have access to GE on computers to complete the project. Good for smaller classes.*  |
| *4- Women and Water* | *#1- Exploring Your Water Sources exercise get students thinking about water scarcity and access and how many of them know where their water comes from. Exercise uses statistics from the USGS.* | *5 minutes* | *Requires instructor to explore the USGS data set to use a talking points in class discussion.*  |
| *4- Women and Water* | *#2- PowerPoint Presentation on the Hydrologic Cycle and the Global South*  | *10 minutes* | *Good for large classes and as an introduction to issues of water scarcity in various parts of the world.*  |
| *4- Women and Water* | *#3- Jigsaw activity that compares the countries seen in the pre-class activity.*  | *25 minutes* | *Requires the students to have done the pre-class activity and requires them to break up into various groups for discussion.*  |
| *5- Hazardous Waste and Love Canal* | *Pre-class activity on the exploration of who Lois Gibbs is and her role in EJ.*  | *38 minutes* | *Requires the students to have internet access.*  |
| *5- Hazardous Waste and Love Canal* | *#1 Think-Pair-Share activity that has students work in small groups to compare their timelines of the events at Love Canal.* | *20 minutes* | *In-class or in lab, large classes OK.* |
| *5- Hazardous Waste and Love Canal* | *#2 PowerPoint Presentation on the timing of land-use changes (10 min)* | *20 minutes* | *Requires GE.*  |
| *5- Hazardous Waste and Love Canal* | *#3 PowerPoint presentation on Love Canal’s Hydrology and timing of the flow of Contaminants students then answer questions regarding presentation in class.*  | *10 minutes* | *In-class or in lab, large classes OK.* |
| *5- Hazardous Waste and Love Canal* | *#4 Getting the Concepts activity Students will identify the features on a block diagram of a groundwater system as a concept test.* | *10 minutes*  | *In-class or in lab, large classes OK.* |
|  *6- Groundwater Availability and Resources* | *Pre-class Homework that uses USGS online data to predict groundwater depletion* | *30-40 minutes*  | *Requires internet access.*  |
|  *6- Groundwater Availability and Resources* | *#1 Think-Pair-Share activity on getting the concepts*  | *10 minutes* | *Requires students to have completed the pre-class activity.*  |
|  *6- Groundwater Availability and Resources* | *#2 Groundwater Depletion powerpoint presentation*  | *15 minutes*  | *Good for classes of all sizes* |
|  *6- Groundwater Availability and Resources* | *#3 Water Conservation Discussion and reading assignment on the Ogallala Aquifer on pdf and word files.* | *20 minutes* | *Good for classes of all sizes* |

***Humans’ Dependence on Earth’s Mineral Resources – used at UTEP in Intro to ESCI and Geological Engineering classes***

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| *Unit* | *Activity* | *Approx. time* | *Suited for:* |
| *1-People, products and minerals* | *#1 - Minerals and products – has students determine minerals in everyday things* | *30 minutes* | *In-class or in lab, large classes OK* |
| *1-People, products and minerals* | *#3 – Economic development, relates use of resources to GDP and population* | *30-40 minutes* | *In-class or lab, used to test quantitative skills for univ. core, large classes OK (but many color figures)* |
| *2-Boom and bust* | *Option 1 – Rechargeable batteries* | *Homework followed by 40 min in class* | *Students find out what their device batteries are made of and how making them drives the costs of minerals (large classes fine)* |
| *3-Mining and Impacts* | *Option 1 – Muffin mining, costs associated with mining and restoration* | *40-50 minutes* | *Messy, probably better for lab, popular for Earth Science Week* |
| *4 – Mineral resources from sedimentary processes* | *#2 – Mining Sand, focus on titanium placer deposits in Florida* | *40-50 minutes* | *In-class or lab, used in classes of 65 students* |
| *5-Mineral resources from igneous and metamorphic rocks* | *Whole activity – focus on sulfide mining outside Yellowstone and in Lake Superior area, also homework on black smokers* | *40-50 minutes (in-class) homework involved* | *In-class or lab, used in classes of 65 students* |
| *6-Mining, society, decision making* | *Option 1 – Phosphorous, homework to read about various aspects of phosphorous usage and mining followed by jig-saw activity* | *30 minutes (in-class) homework involved* | *In-class or lab, lab would be a good place for this because oral presentations/discussions could take place at end, used in classes of 65 students* |

***Climate of Change – Used at UTEP and EPCC in Introd. To ESCI, Blue Planet, Historical Geology***

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| *Unit* | *Activity* | *Approx. time* | *Suited for:* |
| *1-Forecasting variability* | *Reading (homework) followed by gallery walk focusing on how various societies (Inca, Maya, Vikings) coped with climate change* | *40-50 minutes* | *In-class, highly successful in large classes* |
| *2-Short-term variability* | *Case Study 2.1 on changes in temperature, wind direction, pressure of equatorial Pacific* | *50-60 minutes* | *In-class with large classes OK, but would be better in lab, many color figures* |
| *2-Short-term variability* | *Case Study 2.2 on North Atlantic and using Hovmöller diagrams* | *50-60 minutes* | *In-class, large class OK, but lab might be better, many color figures* |
| *3-Anomalous behavior* | *Case study 3.1 on El Nino* | *50 minutes* | *Very nice in large class, not too much color* |
| *3-Anomalous behavior* | *Case study 3.2 on Sea Surface Temp. changes* | *?* | *Have not tried* |
| *4- Slow and steady* | *Case study 4.1 on changes in Greenland Ice sheet temperature and albedo* | *50 minutes* | *Hard to do in a large class (many figures) would work well in lab* |
| *4-Slow and steady* | *Case study 4.2 on changes in size of Greenland ice sheet* | *50 minutes* | *Lab since looking at maps and color figures and making measurements* |
| *5-Systems @ play* | *Activity 5.1 – climate change role playing game* | *50 minutes* | *Did not work well in a large class, small class or lab seems to work well* |
| *5-Systems @ play* | *Activity 5.2 – sea core methane* | *?* | *Have not tried* |
| *6 – Adapting to a Changing World* | *Activity on heat waves* | *50 minutes* | *Worked well in large class, adapted for focus on El Paso* |
| *6 – Adapting to a Changing World* | *Activity on flooding with focus on Netherlands, includes gallery walk* | *?* | *Have not tried* |

***Living on the Edge – Newer Module, Not Yet Tested by UTEP/EPCC Faculty***

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| *Unit* | *Activity* | *Approx. time* | *Suited for:* |
| *1-Hazards of Transform Boundaries* | *Homework on San Andreas, in-class activity on estimating return periods and how to insure buildings in San Francisco* | *50 min**Homework on plate boundaries* | *Lab?* |
| *2-Risks of Transform Boundaries* | *What impact 1906 earthquake had on San Francisco and what would happen now? What decisions would search and rescue need to make, etc.* | *50 min homework on 1906 earthquake* | *Lab by combining with unit 1?* |
| *3-Hazards of Divergent Boundaries* | *Comparing marine and land rift systems* | *50 min, homework required* | *Smaller class or lab* |
| *4-Risks of Divergent Boundaries* | *Examining eruption of Eyjafjallajokull and its impact*  | *50 min.**homework* | *Smaller class or lab* |
| *5-Convergent boundaries, part 1* | *Setting up a volcanic crisis scenario for the Cascadia region* | *50 min. homework* | *Designed to be combined with part 2* |
| *6-Convergent boundaries, part 2* | *Jigsaw activity part 2, forecasting and what to do during/after eruption* | *50 min. homework* |  |

***A Growing Concern – Sustaining Soil Resources for Local Decision Making – newer module, not yet tested, would be good for Intro. To ESCI, physical geology***

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| *Unit* | *Activity* | *Approx. time* | *Suited for:* |
| *1-Landscapes, Land Use* | *View photos of landscapes and consider human impact on land use* | *30-40 min* | *Appears suited to large or small classes* |
| *2-Soil Characteristics* | *Homework on finding out about local soil types, look at actual soil samples* | *40-50 min* | *Likely better in lab so that students can look at real soil samples* |
| *3-Erosion* | *View photos of erosion and visualize what factors cause changes* | *40-50 min* | *Appears suited to large or small classes* |
| *4-Using Soil Web* | *Based on using smart phone/web app, compare local soils to other soils* | *40-50 min.* | *Small classes, labs, wi-fi access needed* |
| *5-Impact of Climate Change on Soil Loss* | *Look at how rainfall, soil type, etc. influence landscape, homework on RUSLE model* | *40-50 min* | *Looks suited to all size classes, could be very relevant to discussion of local soils* |
| *6-Creating an Ag Fact Sheet* | *Focus on writing a fact sheet that discusses how climate change might impact a particular type of agriculture*  | *40-50 min.* | *Looks suited to all class sizes, easily made relevant to local agricultural practices* |