

Syllabus
Spring 2012

Course description:

This course crosses the boundaries of the science disciplines to focus on weather and the pivotal role that water and solar radiation play in the exchange of energy at the Earth's surface. Basic concepts such as the behavior of gases (Ideal Gas Law), energy flow, density changes, phase changes, heat capacities, thermal convection, and thermohaline circulation, will be applied to examine short-term weather and water dynamics (pressure-driven fronts and flows) and longer-term impacts on global warming and climate change. The course has been designed to embrace the 7E learning cycle and instructional model.

Instructional Team:

Ellen Douglas, Assistant Professor, Environmental, Earth & Ocean Sciences (EEOS), UMass Boston

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Scott Balicki, High School Chemistry Teacher, Boston Public Schools

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Erin Hashimoto Martell, Elementary/Middle School Teacher, Boston Public Schools

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Host Site Teacher: Shauna Campbell, Malden Public Schools

Class meetings:

Dates and Times:

Jan 17, 24, 31

Feb 7, 14, 28

Mar 6, 17*, 20, 27,

Apr 3, 10, 24, 28*

May 1.

Tuesdays 4:00 to 7:30pm

***Saturdays 9:00am to 4:30pm (March 17 & April 28)**

Location: Malden High School, Room B442

Required Texts:

Mackenzie. *Our Changing Planet*. Third edition. Prentice Hall, 2003.

Roberts. *Air, Water, and Weather: Stop Faking It*. First edition. NSTA, 2005.

Expectations:

To receive graduate credit, participants must attend all course sessions, complete all homework assignments and quizzes, participate in both pre- and post-course assessments, submit a lab notebook, and complete a course project. The lab notebook should include write-ups and brief analyses of investigations during the course, formative assessments, and evidence of learning.

Course Project:

Each student will choose a content area from the *Weather and Water* course and an education research article to develop a detailed lesson plan/unit plan that incorporates the 7E model. The completed project will be presented to all class participants on the last day of the course. Group meetings outside of class will likely be required to complete this assignment.

Grading:

Lab Notebook: 50 points

Homework: 10 points each (80 total)

Homework quizzes: 10 points each (80 total)

Class Participation: 20 points

Pre-assessment: 20 points

Final assessment: 50 points

Project: 100 points

Course total: 400 points

Course Topics:

Week	Topics
1	Introduction, Introduction to wiki Pre-Assessment Density
2-3	Heat and heat transfer, conduction, radiation
4-5	Gases and the gas laws
6-7	Ocean processes Weather patterns
8	Water cycle and precipitation
9-10	Chemistry: Conservation of matter and stoichiometry
11	Carbon cycle
12-13	Climate processes and climate change
14	Data Analysis with Excel Field trip
15	Project Presentations Final Assessment