**Authorization To Offer Non-Degree Extension Credit Course Through Extended Studies**

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<tbody>
<tr>
<td>2a. Course abbreviation and Number: EDST E1011</td>
<td>2b. Abbreviated Title: Ocean Science</td>
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<td>(No more than 25 characters, including spaces)</td>
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<td>4. Number of Units: 3</td>
<td>5. Billing Units: 0 ($80)</td>
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<tr>
<td>6. Allowed Student Levels: <strong>UG X</strong> <strong>GR X</strong> <strong>EE X</strong> (Default is to check all three levels)</td>
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<td>7. Grading Method:</td>
<td>Normal (N) <strong>X</strong> (Default is Letter Grade +/-, Students may request Credit/No Credit)</td>
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<td>Normal Plus Report-in-Progress (NP) (As for Normal; also allows Report-in-Progress)</td>
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<td>Credit/No Credit Only (C)</td>
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<td></td>
<td>Credit/No Credit or Report-in-Progress Only (CP)</td>
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<tr>
<td>8. Mode of Instruction:</td>
<td><strong>Lecture 3</strong> <strong>C-02</strong></td>
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<td>(See pages 17-23 at <a href="http://www.calstate.edu/elm/data-element/APDB-transaction-DED-SectionY.pdf">http://www.calstate.edu/elm/data-element/APDB-transaction-DED-SectionY.pdf</a> for definitions of the Course Classification Numbers)</td>
<td><strong>Activity</strong></td>
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<td><strong>Lab</strong></td>
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<td>9. Attributes: Course Requires Consent for Enrollment? <strong>Yes X No</strong></td>
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<tr>
<td>Faculty <strong>X</strong> Credential Analyst Dean Program/Department - Director/Chair</td>
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<td>Prerequisites:</td>
<td>Co-requisites:</td>
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<td>10. Does this course impact other discipline(s)? (If there is any uncertainty as to whether a particular discipline is affected, check &quot;yes&quot; and obtain signature.) <strong>Yes X No</strong></td>
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<td>If yes, obtain signature(s). Any objections should be stated in writing and attached to this form.</td>
<td>Support Oppose</td>
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<tr>
<td>Discipline Signature Date</td>
<td>Support Oppose</td>
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<td>Discipline Signature Date</td>
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**Important: Please Complete**

1. Instructor: Kathy Norman

2. Extension Course Proposal Form (attached)

**SIGNATURES: (COLLEGE LEVEL)**

1. Program Director/Chair Kathy Norman 2/4/08

2. College Dean (or Designee) 2/4/08

**UNIVERSITY LEVEL**

3. Dean of Extended Studies (or Designee) 3/14/08

4. Vice President for Academic Affairs (or Designee) 3/14/08
Ocean Science Syllabus 2007

Faculty Information

Faculty Name: Dr. Juliana Texley

Address: Box 215, New Ballimore, Mi 48047

Phone: 586.405.3641

Email Address: jtexley@att.net or juliana.texley@cambridgecollege.edu

Course Title: Ocean Science

Course Description: This five week cross-disciplinary course examines the physical, chemical and biological factors that influence the ocean. Designed for students with a general science background, the course supports content with a discussion of the methods through which students can achieve ocean-related content in the National Science Education Standards. Students read a variety of course materials and perform weekly assignments, including one to two discussion board activities per week. Those activities comprise approximately 45 hours of "student seat time." Students taking the course for 3 graduate credits also complete a 10-15 page Action Research Paper.

Course Delivery: Critical to the professional-development experience of teachers today is learning to function effectively in an online learning environment, one that is destined to expand in the future. Ocean Science is an online course completed in five weeks, with an additional one-week grace period for submitting assignments. Although students may work on assignments offline, all course content, links to supplementary information, interaction among students in the class, class discussions, assessments, submission of assignments, and interaction with the instructor are carried out online, through email and the course site. This online format is designed for educators who need access to professional development on a flexible schedule and who are in different locations worldwide. Not all participants in this course will earn college credit, some are earning CEUs or auditing. Students earning college credit are required to participate in advanced discussions and complete all assignments.

Course Objectives/Outcomes:
Performance Objectives
In this course students will develop:
1. A deep content knowledge of the physical and biological components of the ocean biome.
2. An understanding of the relationship among physical and biological components in maintaining the oceans, climate and atmosphere.
3. An understanding of the importance of the ocean ecosystem in Earth's environment.

Competencies Objectives
In this course, students will be able to:
4. Explain ocean phenomena using information from physics, chemistry and biology.
5. Understand the parameters and effects of ocean pressure at various depths.
6. Interpret satellite and other sensor images as ocean data.
7. Use hands-on demonstrations and constructivist dialogue to support student learning.
8. Integrate ocean science knowledge, skills and attitudes with language arts and mathematics.
9. Apply the knowledge of the ocean science to societal issues.

Improvement Practices
Upon completion of this course, students will:

10. Identify methods to reduce potential misconceptions in middle school students.
11. Rely on better sources of information for most current ocean science information.
12. Use action research to develop better constructivist methods to ocean science courses.

Lesson Plans

**Topic One: Blue Planet**
The ocean creates a unique environment on Planet Earth.

**Major Ideas:**

A. Ocean Planet. Provides a description of Planet Earth, comparing its geology to the other planets in the solar system.
C. Ocean Power: The Spinning Earth. Examines the effects of Earth rotation on tides and climate in the Coriolis effect.
D. Ocean Power: Tides. Integrates knowledge of solar energy and rotational forces to examine ocean tides and currents.
E. The Sea Floor. Examines the topography of the ocean floor.
F. Hit the Beach. Examines the topography of shorelines and factors that affect them.
G. Land's Gift to the Sea. Examines erosion, deposition and other interactions between land and ocean topographies.
H. Surf's Up. Looks at the formation and effects of waves on the ocean and the land.
I. The Bottom of the Sea. Looks at the ecology of deep sea environments.

**Topic One Assignments:**

a) Create a student home page.
b) Declare the nature of the credit sought — Graduate, CEU, or Audit.
c) Read the Course Documents for Topic One.
d) Demonstrate competence in course content by taking a quiz. (5%) 
e) Become familiar with a variety of scholarly sources on ocean science research and ocean science education, reflecting an understanding of current best practice. These sources will become the basis for the development of an Action Research Paper. Special emphasis will be placed on SEAWIFS (http://seawifs.gsfc.nasa.gov/SEAWIFS.html), NOAA Satellites and Information (http://www.nesdis.noaa.gov/) and on NOAA (http://newport.pmel.noaa.gov/nemo/realtime/)

**Topic Two: Drop By Drop**
This Topic explores the chemistry of ocean water.

**Major Ideas:**

A. Getting Wet. Reviews the chemical structure of water.
B. A Dash of Salt. Looks at dissolved salts in ocean water, emphasizing NaCl.
C. Banking on Minerals. Extends understanding of salts and other minerals in ocean water to explore cycling of key ions.
D. Dissolved Gases: CO₂. Examines the concentration, cycling and effects of carbon dioxide in ocean ecosystems.
E. Dissolved Gasses: O₂. Looks at production, cycling and effects of oxygen in ocean ecosystems.
F. Sea Soup. Integrates understanding of dissolved salts and gases into an examination of plankton as a component of ocean water.

**Topic Two Assignments:**

a) Read the Course Documents for Topic Two.
b) Contribute a hands-on activity to illustrate an ocean science concept that reflects an understanding of constructivist learning theory. The activity should be related
to at least one area reflected in the course content. Ideas are found in sources such as http://www.jasonproject.org.

c) Comment on the activities of other students on the appropriate Forum.
d) Compare and discuss the suggested content benchmarks for ocean science in the National Science Education Standards at http://books.nap.edu/html/nses/html/index.htm
e) Complete mastery of course documents by taking a quiz. (5%) 
f) Begin to articulate the goals and objectives of the Action Research Project.
Confer with the Instructor before initiating this project. Components of the project or paper can be assembled from weekly assignments.

**Topic Three: The Deep Blue Sea**
This Topic looks at the physics of ocean water, with emphasis on pressure.

**Major Ideas:**

A. The Deep Blue Sea. Establishes the pressure gradient in ocean ecosystems and explores its effect on living things.
B. Buoyancy. Students explore the physics of flotation and the adaptations of living organisms to a liquid environment.
C. Exploring the Ocean. Key researchers who have pioneered the exploration of ocean environments are described and their methods are reviewed.
D. Finding the Sea's Level. Reviews the evolution of technologies to map sea level changes and relates these changes to climate cycles on Earth.
E. Deep Sea Vent Communities. Extends the study of deep sea environments to look at the adaptations of organisms to these unique environments.
F. Pioneers in Oceanography. Considers the history of Oceanography and the scientists involved.

**Topic Three Assignments:**

a) Read the Course Documents for Topic Three.
b) Review a variety of trade book literature appropriate to a specific grade and learning environment.
c) Contribute an annotated bibliography of one piece of children's trade literature.
d) Discuss methods of integrating language arts and ocean science, evaluating the relative importance of content and context.
e) Examine and discuss an example of use of trade literature.
f) Demonstrate mastery of course documents by taking a quiz. (5%)
g) Continue to develop the design of the Action Research Paper in consultation with the Instructor.

**Topic Four: The Ocean and Climate**
This Topic covers the water cycle, winds, currents and tides as they interact with the land.

**Major Ideas:**

A. Cycling Water. Looks at the water cycle, relating evaporation and condensation to the formation of storms, weather and climate.
B. Land and Sea Breezes. Integrates understanding of the water cycle and solar energy to explain shoreline weather.
C. Currents and Local Weather. Examines the patterns of ocean currents and how they affect weather on land.
D. Least Wanted Christmas Child. Reviews the climate cycle known as "El Nino."
E. Whose Ocean Is It? Examines dominion over the oceans.

**Topic Four Assignments:**

a) Read the Course Documents for Topic Four.
b) Contribute to the construction of a role play activity on ocean science and analyze its use in the classroom at a variety of levels. The activity illustrates application of course content to societal issues, and integration of research and statistical data into a position paper on environmental change.

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c) Compare a variety of sources as the basis for the analysis of how a role play activity might be implemented in the classroom. Design a rubric for use of the activity as an assessment.
d) Demonstrate mastery of course documents by taking a quiz. (5%)
c) Continue to work on Action Research Project

Topic Five: What Color Is Your Ocean?
Living things are influenced by and influence the ocean ecosystem.

Major Ideas:
A. Sunlight. Reviews the electromagnetic spectrum and its effects on Earth.
B. Photosynthesis. Looks at the process by which plants capture solar energy to synthesize organic molecules.
C. Biodiversity. Examines the adaptations of ocean organisms to use all possible solar energy in ecosystems.
D. Zone Defense. Reviews the geography of ocean and relates that to specific habitats in ocean zones.
E. Turbidity. Examines the effect of dissolved solids in the transmission of solar energy and the energy uses in ocean ecosystems.
F. All One Ocean. Integrates the geology, chemistry, physics and biology of the ocean into an understanding of the impact of changes in the ocean on Earth's future.
G. Putting It All Together.

Topic Five Assignments:
a) Read the Course Documents for Topic Five.
b) Contribute a cluster activity/assessment based on a graphic representing ocean science research. This assessment should reflect a variety of levels of cognitive demand, and a variety of assessment forms (objective and open response.)
c) Demonstrate mastery of course documents by taking a quiz. (5%)
d) Complete and submit the final copy of the Action Research Paper to the Instructor. Present your findings to the class by posting to an appropriate Discussion Forum and gather feedback from student peers.
e) Complete the JASON Course survey.

Action Research Paper Guide:

Students earning graduate credit will design and complete an Action Research Paper or project showing scholarly research and/or practical application of course objectives. The paper should include references to scholarly sources such as those cited in this syllabus. The project must be based upon current scientific research in ocean science and must include summaries of content and pedagogy research. The project must involve at least 15 hours of work and should consist of:

1. Review of ocean science literature to select a topic around which to develop a classroom activity.
2. Correlation of the topic and activity to state and national science content standards.
3. Implementation of the project with students or other teachers.
4. Evaluation of implementation through student assessment and feedback.
5. Analysis of project implementation and assessment results, with recommendations for use of activity and implementation of improvements based upon feedback.

Texts (required readings): Course Content found in Blackboard

JASON Ocean Science (online text)

Bibliography (required and optional readings): Course Content found outside Blackboard


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b) NOAA Satellites and Information  http://www.nesdis.noaa.gov/
c) NOAA  http://newport.pmel.noaa.gov/nemo/realtime/
d) NOAA, http://www.nws.noaa.gov

e) SEAWIFS (http://seawifs.gsfc.nasa.gov/SEAWIFS.html)
f) Students will be responsible for obtaining online, journal and text-based sources as appropriate to support their own assignments and the Action Research Paper.

Student Evaluation Process:
Students demonstrate achievement of course goals through objective tests, weekly assignments, participation in threaded discussion and a 10-15 page Action Research Paper or project which combines the development of classroom methods and scholarly research.

The final grade for this course is based on
1) Completion of the course assignments (50%)
2) Substantive participation in weekly discussions (25%)
3) Performance on assessments (25%)
4) Students earning 3 graduate credits will submit an Action Research Paper or project which will be averaged with equal weight to the class grade.

* Students not taking the course for graduate credit do not have to complete the Research Paper and must obtain at least 70 points to pass the course

* Students taking the course for graduate credit will be graded according to the Plus/Minus Grading Scale:

- A+  97-100
- A   94 - 96.99
- A-  90 - 93.99
- B+  87 - 89.99
- B   84 - 86.99
- B-  80 - 83.99
- C+  77 -79.99
- C   74 - 76.99
- C-  70 -73.99
- D   50 - 69.99
- F   50 >

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Juliana Texley, Ph.D.

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J.Texley@att.net
586-405-3641

Experience

2000-Present  Technical writer, Educator

Science Education/Science Instructor
- Cambridge College (2002-Present) Science and Science Education
- Instructor: Online Learning, Multimedia, Technology and Assessment, Central Michigan University (1998-Present)
- Facilities consultant, National Science Education Association
- Instructor: Safety, Assessment, Online Instruction, Cell Biology and Ocean Science, Jason Academy (2001-Present)
- Instructor, Biology Palm Beach Community College (2000-Present)
- Science Chair, Michigan SCoPE Online Project (Dept. of Treasury) (2002-2004)
- Web Editor, National Science Teachers Association (2001-2005)

1993-2000  Anchor Bay School District  New Baltimore, Mi

Superintendent of Schools
- Brought district from deficit to $5 million in equity
- Negotiated all contracts, including 5 expedited MEA contracts
- Passed and personally coordinated 5 bond issues for 5 schools, $240 mil.
- Raised test scores and led professional development efforts
- Leadership positions in Chamber of Commerce, United Way

1990-93  Anchor Bay School District  New Baltimore, Mi

Assistant Superintendent/Curriculum
- Wrote competitive grants totaling over $1 million.
- Raised state test scores for three consecutive years.
- Developed new and innovative professional development programs.
- Wrote and implemented Michigan Systemic Initiative grant for improvement in mathematics and science
- Taught science and science education for 3 universities

1973-90  Richmond Schools  Richmond, Mi
- Taught middle and secondary science and mathematics
(1 year leave to lead science department at University Liggett in 1984)

Education

1969  Oakland University  Rochester, Michigan
- B.A., Biology, Chemistry/physics.
- Graduated Summa Cum Laude.

1972  Wayne State University  Detroit, Michigan
- M.S., Biology.

1980  Wayne State University  Detroit, Michigan
- Ph.D.
- Curriculum Development
Interests and awards:

Editor of *The Science Teacher* for 12 years (including editing award-winning series such as *Difficult Decisions* bioethics articles.)

Fellow of the American Association for the Advancement of Science 2003

Presidential Award for Science Teaching, 1884

EdPress Award for outstanding publication (*Pathways*, 1998)


Ms Zip Award for Community Service, 2000

Selected Publications and Workshops:

*Discovering the Science of Alcohol*, (Grant from NIAAA), 2007

"Do you have a platform to stand on?" (with David Adelstein), *The Science Teacher*, October, 2006.


*The Bear, the Rose and the Swan*, (Fiction) Saga Books, 2005.


Advances in Genetic Technology. (Advisory board member for program that taught genetics and bioethics for secondary students) BSCS 1989

(Over 100 publications from 1980-2006 in biology, technology and education)

References:

(Beyond Central Michigan University)

Marily DeWall, Director (emeritus) JASON Academy www.jason.org

David Beacom, Director of Publications, National Science Education Association, dbeacom@nsta.org