

# Between Earth & Sky



*The stars, earth, stones, life of all kinds form a whole in relation with each other, and so close is this relation that we cannot understand a stone without some understanding of the great sun. No matter what we touch, an atom, or a cell, we cannot explain it without knowledge of the wide universe. The laws governing the universe can be made interesting and wonderful to children, more interesting even than things in themselves, and they begin to ask: What am I? What is the task of humanity in this wonderful Universe?*

--Maria Montessori--

<b>First People's Program at Muckleshoot,</b>	<b>Antioch University Seattle</b>
Earth and Space Science (with lab): BATC451B/EDU551B	Spring Quarter: 2006
<b>Faculty:</b> Rebecca Chamberlain e-mail: chambreb@evergreen.edu Phone ext. (360) 866-2141	<b>Meeting Times:</b> 9:30-5:00 <b>Dates:</b> April 8, 22, May 6, 20, June 3 <b>Location:</b> Muckleshoot Tribal College 39811 Auburn/Enumclaw Rd. SE, Auburn, WA 98092 253-876-3183

*Look deep into nature, and then you will understand everything better.*

*Our task must be to free ourselves...by widening our circle of compassion to embrace all living creatures and the whole of nature and its beauty.*

--Albert Einstein--

## **I. Course Description:**

This course will engage participants in examining earth and space science investigations with cultural teachings, mythology, and cosmology. We will touch upon a variety of approaches for integrating modern scientific observations and methods with cultural approaches to hands-on education and appreciation for the cultures who have created records for archeo-astronomy. We will explore Earth and Space science concepts and teaching strategies needed to foster an inquiry based learning environment for diverse learners. On fieldtrips and in workshops, we will learn basic methods of observation and classification, as well as theories of formation and composition including: identifying constellations; cycles and progression; the formation of planetary and celestial bodies; rock, soil, and fossil identification, etc. We will use a variety of interdisciplinary approaches to explore our fascination with Earth's ever-changing events, what is within and beyond the solar system, and Earth's interaction in space.

Participants will create and design lesson plans; perform investigations; discuss and critique articles, books, and films; review the National Standards and WASL & GLE assessment materials; and examine the history, role, and use of scientific inquiry and technology as it influences culture and understanding. We will explore ways to engage the imagination as we incorporate traditional values and environmental awareness into our work in science classrooms. We will take field trips to: The Pacific Science Center and the Star-lab Planetarium; ancient marine fossils in a geological site in Tukwilla; and attend a gathering to "bless the earth" hosted by Upper Skagit elder, Vi Hilbert, at Benaroya Hall. We will also visit with and participate in workshops with a number of guests including: Len Adams (Kootenai), Astro/Physics and Science Education; Nan McNutt, Science and Cultural Education at the University of Washington's "Science and Tribes Program;" Pam Carter, Geologist/Science Educator; Dennis Schatz, Ph.D, Lead Astronomer/Science Educator, The Pacific Science Center; and Molly Mier, Environmental Scientist/Geologist, working with rocks and soils with Indigenous communities in Asia and the Pacific.



*One of the most essential tasks of education is to teach the sense of the whole. With a sense of the whole, which can also be called a cosmic sense, a person can see how all the strands of life are part of a greater fabric, and how the details of one's own life have a significance that reaches out to include one's community of life and even the entire planet.*

--Brian Swimme Ph.D, Astrophysics/ Mathematics--

## **II. Texts**

### **Required Books & Resources:**

- Gibilisco, S. (2003). *Astronomy Demystified: A Self-Teaching Guide*. New York: McGraw Hill  
(0071384278)
- Mechler, G. (1999). *National Audubon Society First Field Guide: Night Sky*. Scholastic Reference.  
(0590640860)
- Smith, S. (1992). *Project Earth Science: Astronomy*. National Science Teachers Association.
- Swimme, B., & Berry, T. (1992). *The Universe Story: From the Primordial Flaring Forth to the Ecozoic Era—A Celebration of the Unfolding of the Cosmos*. San Francisco: Harper.  
(0062508350)
- Williams, L. (2004). *Earth Science Demystified: A Self-Teaching Guide*. New York: McGraw Hill.  
(39785 50825)

Pacific Science Center ([www.pacsci.org](http://www.pacsci.org)) 200 Second Ave. N., Seattle, WA 98109 (206) 443-2851

Astronomy Curriculum & Resources ([www.pacsci.org/education/curricula/astro.html](http://www.pacsci.org/education/curricula/astro.html))

*Astro Adventures I*: A comprehensive upper elementary curriculum that integrates the national and state standards in science education. (\$24.95)

**or**

*Astro Adventures II*: Middle & High School Curriculum (\$44.95)

\*Note: You can purchase one of the *Astro-Adventures* instead of, *Project Earth Science: Astronomy*, by Smith.)

PBS, *Nova "Origins."* Outreach materials: Astrobiology in the Classroom, "Origins" Educational Outreach, Links. ([www.pacsci.org/origins/](http://www.pacsci.org/origins/))

Office of the Superintendent of Washington State

Science GLEs for the state of Washington-<http://www.k12.wa.us/> (see curriculum)

Science WASL Released Items-<http://www.k12.wa.us/> (see assessment)

### **Strongly Recommended:**

- Williamson. R. A. (1987). *Living the Sky: the Cosmos of the American Indian*. University of Oklahoma Press. (0806120347)
- Williamson. R. A. (1987). *They Dance in the Sky: Native American Star Myths*. Houghton Mifflin. (039539970X)
- Van Cleave, J. (1991). *Janice Van Cleave's Earth Science for Kids: 101 Easy Experiments that Really Work*. (0471530107)
- Tasa, D. , Lutgens, F., & Tarbuck, E. (2002) *Geode: Earth Science: Multimedia Explorations in Geology, Oceanography, Weather and Climate, and Astronomy* (CD-Rom edition), Prentice Hall. (0130477893)

**For Further Reference:**

- Bruchac, J. (1997). *Thirteen Moons On Turtle's Back*. Putnam. (0698115848)
- Caduto, M., Bruchac, J. & Fadden, J. K. (1999). *Keepers of the Earth: Native American Stories and Nocturnal Activities for Children*. Fulcrum Publishing. (1555913857)
- Caduto, M., Bruchac, J. & Fadden, J. K. (1994). *Keepers of the Night: Native American Stories and Environmental Activities for Children*. Fulcrum Publishing. (1555911773)
- Freedman. R. A. and Kauffman, W.J. III, (2001) *Universe*, CD Edition. W. H. Freeman & Co. (0716746476)
- KUOW radio & PBS Series: Science Friday, ([www.sciencefriday.com/pages/misc/faq/flatow.html](http://www.sciencefriday.com/pages/misc/faq/flatow.html))  
For Teachers (ongoing resources)  
Science Friday Kids Connection (special programs)
- Girl Scouts of America: Girls, Science, and Technology ([www.girlsgotech.org](http://www.girlsgotech.org))



*Imagination is more important than knowledge. Knowledge is limited. Imagination encircles the world.*

*Logic will get you from A to B. Imagination will take you everywhere.*

--Albert Einstein--

**III. Course Objectives:**

1. To kindle and combine one's enthusiasm for personal discovery and learning with one's professional responsibility as a teacher.
2. To examine, apply, and comprehend Earth and Space science concepts and various instructional strategies needed to meet the individual needs of diverse learners.
3. To construct and develop a special project or lesson plans that align with the state EALRs and GLEs.
4. To engage in meaningful learning experiences that demonstrate the inquiry process, and promote critical and problem solving skills.
5. To weave interdisciplinary approaches, cultural teachings, science, technology, the World Wide Web, CD's or other resources to enrich lesson plans and research.



*The important thing is to not stop questioning*

--Albert Einstein--

**IV. Assignments and Course Policies:**

## **A. Participation and Attendance (20%)**

-You are expected to actively engage in all group activities, seminar discussions, field-trips and presentations.

- You are expected to attend all classes. Our time is limited. A number of guest speakers are giving their time to develop workshops for us, and we are going on field trips and attending events that cannot be made up. Complete participation is mandatory to honor the learning experience of fellow cohorts and guests who are joining us. In the event of a serious emergency, you must contact me by phone prior to the class session.

## **B. Written Work, Projects and Portfolio**

-Include your name, due date and course number on all assignments.

-All written assignments must be typed following the American Psychological Association (American Psychological Association, APA) format. This includes ways to format your bibliographic citations, quotes, footnotes and other stylistic devices. See any standard English style text or web site for details.

-All assignments are due on the designated day. Completion of reading responses, drafts of special projects, etc. are necessary for class discussions and peer group workshops. If you are planning to graduate spring quarter you MUST have all of your assignments turned in to me by June 3<sup>rd</sup>.

-You will be participating in a peer-group editing workshop on May 20<sup>th</sup>. You will need to have a draft of your final project (or project overview) for editorial comments and suggestions. You will need to edit and revise, or refine and develop your project based on your peer group suggestions.

**1. Reading Response Papers (25%).** You will complete eight weekly reading assignments and response papers. These are due each week (1-2 pages.) You will bring hard copies of these assignments to each class meeting, to turn in for comments and to use as the basis for seminar discussions. On weeks that class does not meet, you must e-mail your paper to the instructor and to a cohort group. These papers allow you to: 1) comment upon the readings, lectures, workshops, guest artists, and films, and 2) summarize, reflect upon, and integrate program topics, themes, and issues, 3) include what you learned, application, and applicable EALRs and GLEs. For more detail see handouts on writing response papers and the reading schedule.)

**2. A final project and presentation (30%).** You will have a chance to work in groups and individually to develop a final project. You will present a written draft of this project on May 20<sup>th</sup>, to a small group, and you will give a final presentation of your work on June 3<sup>rd</sup>.

Depending on your preferences and professional situation, select and complete **one** of the following activities for your final project.

A. Write a 3-5 page academic essay or research paper on a topic of your choice in earth and space sciences that integrates and analyzes ideas, concepts, or themes raised class. To supplement your work, you must: 1) cite at least three resources or research sources that explore your topic and list them in a bibliography; 2) state how you plan to use your learning in the classroom, 3) state how you will apply State EALRs and GLEs.

**OR**

B. Write a curriculum on earth and/or space sciences. You may develop one comprehensive curriculum project, with a series of activities that run for two to three weeks, or several shorter activities that are self contained. Depending on the detail and complexity of your lessons, you should develop from four to ten activities. Use the lesson plan model from the *Pedagogy Assessment*, that you have developed for other instructors. At minimum, you should include: 1) a thorough description of your lesson plan(s); 2) a statement of the concepts and objectives that incorporate the State EALRs and GLEs; 3) a list of materials; and 4) a bibliography of research, readings, or resources that you found valuable in developing your project.

**OR**

C. An assignment of your own design pre-approved by the instructor by April 22nd. This could be developing a comprehensive bibliography of curriculum materials, a web site, CD Rom, film or other resources for K-12 education in the earth and space sciences. You must include a statement of your process, how you plan to use it your teaching, and how your project will incorporate the State EALRs and GLEs .

### **3. Class Portfolio (20%).**

Each student is required to keep a class portfolio. **Record the topic and date of each item** in your portfolio. Each section should be arranged chronologically. The portfolio must be kept in a loose-leaf three ring binder with dividers and should contain the following:

- 1) Table of contents
- 2) Course syllabus, covenant, and all class handouts
- 3) Class notes: lectures, guest speakers, field trips, seminar discussions, workshops and films.
- 4) Reading response papers for required texts and readings.  
Any notes or exams that you take from the required texts (optional).
- 5) Special Project, including first draft, peer feed-back, and final draft.

#### **Assessment:**

All assignments will be assessed according to the guidelines and requirements for each assignment listed above, and covered in class. I will write a narrative evaluation for each student. A passing grade is a C or better for undergraduates, and a B or better for graduate students.

