Mālama I Ka 'Āina (Sustainability)
EDCS 433 Interdisciplinary Science Curriculum (3 Cr)
EDCS 450 Lab/Field Materials and Methods (3 Cr)
2012-13 Syllabus and Schedule
Kaua'i and O'ahu

UPDATED JUNE 16, 2012

Schedule and Sites:

- UHS 1-107 Orientation for O'ahu participants: June 9, Sat. 9 a.m. - 12:00 p.m.
- **Kaua'i Immersion June 18-22, M-F: Book/pay your own flights.** Ground travel, meals, lodging provided. Stipends set up through WH-1will reimburse air travel, Administrative Fees.
- Optional Nualolo Kai, June 23, Sat.: 5 a.m.-7 p.m.: service learning, archeology, botany, swim in/out. (Sat. flights to HNL at 9, 10:30, 11 p.m., check for connecting flights to Maui, Hawaii)
- **O'ahu participants: July 6-7, Neighbor Island participants explore local resources**
- **O'ahu classes: all participants: July 13-15, Oct. 5-7, Jan. 18-20, Mar. 22-23, 2013**

Updated EDCS 433/450 schedule and syllabus: http://manoa.hawaii.edu/coe/kulia/
***Kūlia I Ka Nu'u* funded under Award No. S362A090012 Native Hawaiian Education Act, USDOE**

Prerequisites: Introductory courses in science, teaching experience.
Instructor: Pauline Chinn, chinn@hawaii.edu, Site Teachers/Co-Instructors: Sabra Kauka, Huihui Kanahele-Mossman, Chris Baird, Alyson Barrows, Manuel Jadulang, Michelle Kapana-Baird, Matt Kanemoto, Jennifer Kuwahara, Mahina Hou Ross, Kellie Kong.

Texts and Videos:

Pikoi Ke Kaula Kualena Curriculum Book (posted on website)
Videotapes: *Ahupua'a, Fishponds, Lo'i, Taking of Waikiki, Na Pua O Maunalua*
Readings: Posted on Class Website or accessible from world-wide web
Resource for books, curriculum, language: http://ulukau.org/

Course Goals: Research shows Hawaiian practices oriented to sustainability are grounded in scientific principles. Sayings such as *Hahai no ka ua i ka ululā'au*; Rains always follow the forest (Pukui, 1983) recognize that mists condensed on trees and entered the groundwater. Thus forests that preserve the watershed must be protected. A Hawaiian worldview connects humans and nature, a way of thinking fundamental to sustainability in the 21st century. These interdisciplinary science courses provide models of 5E science lessons and pedagogical strategies to prepare you to design rigorous inquiry lessons connected to students' places, cultures, and issues. Our goal is to empower you to increase your students' success in STEM (science, technology, engineering, math) courses. Collaborations with Bishop Museum, Polynesian Voyaging Society, NSF's Kahua A'o Hawaiian Newspaper Translation Project, DLNR, Kamehameha Schools-Bishop Estate, National Tropical Botanical Gardens, UH and agency scientists, and Site Teachers will provide you with personal and professional contacts to support your instruction.

Course Objectives: EDCS 433 and 450 will enable you to:

1. Use course activities to write, teach, and assess Hawaii-focused hands-on, minds-on 5E lessons that address cultural, science and other content standards for integrated lessons.

2. Connect real issues to lessons oriented to healthy communities and sustainable ecosystems.
3. Include community in rigorous and relevant lessons that build relationships and responsibility.

Instructional Procedures: **Sabra Kauka Host Site Teacher, June 18-22 Kaua'i culture-science immersion**, field, laboratory, site teacher-led activities; lectures; individual and group work; guest and peer presentations; visits to cultural sites; ETEC applications.

COMMON CORE FOR EDCS 433 AND 450: THINK/WRITES AND FIELD/LAB EXPERIENCES

FIELD/LAB ACTIVITIES:

- Stream Transect/Water Quality Monitoring
- Native (endemic and indigenous) species, Polynesian introductions (Canoe Plants), Invasive Species
- DNA Extraction from strawberries, bananas
- Acids and Bases: Ocean acidification, VOG
- Hawaiian geoscience: weather, geology, currents

20 POINTS: THINK/WRITES:

- T/Ws support 5E curriculum design (Engage, Explore, Explain, Elaborate/Extend, Evaluate) research, reflection, sharing of ideas. T/W 1-8, 2 points each, T/W 9, 4 points, 1-2 pages.
- Post T/Ws on class social networking site, respond to 2 peers. T/W 1-2 due June 18; T/W 3-4 due July 14; T/W 5-6 due October 6; T/W 7-8, due Jan. 19, T/W 9-10 due March 23, 2013.

T/W 1. Engage: When/what first interested me in science? Write your autobiography related to science interests and education. OR Interview a student about his/her science interests (Young children may not be familiar with the word "science." You'll have interesting responses.) (June 18)
T/W 2. Explore: What do you consider to be critical problems with science education and possible solutions? OR Interview a student or parent about this and how they would like to learn. (June 18)
T/W 3. Explore: Discuss culture as resource then write a lesson sketch for your students. (July 14)
T/W 4. Explore: Discuss a health issue in your students' lives, write a lesson sketch. (July 14)
T/W 5. Evaluate: At this point, support in this area would help me carry out my objectives. (October 6)
T/W 6. Explain: What evidence if any do I have that culture and place-based learning supports engagement and learning, especially of students most at risk of failure? (October 6)
T/W 7. Evaluate: What aspects of place-based education are most helpful for my teaching? (Jan. 19)
T/W 8. Evaluate: How is your network of human and place resources (parents, scientists, colleagues, agencies) changing? How have these resources support and changed your instruction? (Jan. 19)
T/W 9. Evaluate: What kinds of learning supported students' learning and engagement? (March 23)
T/W 10 Evaluate: What were most useful aspects of the class? What topics do you want to learn more about? What skills and practices do you want to pursue further? What are a few suggestions for improvement? (March 23)

COURSE REQUIREMENTS EDCS 433

30 Pts. Paper 1. *Ahupua'a* and Cultural Landscape including interview (5 references, 8-10 pages) Identify your/your school's *ahupua'a* and locate it on a map. What are Hawaiian place names, legends and history? How has it changed from pre-contact to present? Interview a long time resident. (**Presentation/Due July 14**)

20 Pts. Paper 2. Local Resources and Place-based Curriculum Development. Describe your community, school, student demographics, and NCLB status to set the context. Then identify 3 people, places, issues, or activities in your school or community that could be developed into meaningful and standards-based lessons. From the 3 resources identified above, write 2 lesson sketches using the 5E Kulia

lesson template. (These lesson sketches may be developed into formal lesson plans for classroom implementation.) (**Presentation/Due Oct. 6)**

30 Pts. Paper 3. Place, Culture-based, hands-on Lesson Plan. Science is a cultural activity and stories and concrete activities help students learn and understand (2+ references, 5 pp.) **Two Parts**: 1) **Present** plan with hands-on component in **January 18**. 2) Present outcomes of lesson and final lesson plan to post on Kulia website with measures of student learning, indicators of engagement, teacher and student evaluation, reflection **March 23** .

COURSE REQUIREMENTS EDCS 450 METHODS AND MATERIALS

Note for Papers 1, 2, 3

- Part 1: Present FT, Experimental Lesson Plan, Mini-inquiry sketches **July 14, update Oct. 6 and Jan. 19.**
- Part 2: Final write-up to post on Kulia website includes implementation, measures of student learning, indicators of engagement, teacher and student evaluation, reflection due **March 23, 2013**.

30 Pts. Paper 1. Field Trip Lesson Plan: Place, Culture, standards, and inquiry-oriented (5 references, 5 pp.) See schedule above.

30 Pts. Paper 2. Culturally relevant, Experimental Lesson Plan: hypothesis, variables, controls, data collection, analysis, discussion, conclusion (5 references, 5 pp.) See schedule above.

20 Pts. Paper 3. Individual or Small group inquiry: See below or develop your own--explore in advance to develop lesson plan to teach as authentic, place-based inquiry (5 references, 5 pp.) See schedule above.

- Mini Field Guide: Identify 10 plants in your neighborhood or school yard--categorize as endemic/indigenous or introduced by Polynesians (canoe plant) or post-Cook.
- Mini-Ecosystem: What's in my garden and what's going on? Study a mini-ecosystem for 7 days/nights, develop a local food web, identify ecological niches, adaptations of plants and animals.
- Mini-field Guide: Identify 10 birds or insects, other category of animals in your community: origin, behavior, impact if any on local ecosystem and native fauna
- Mini-field Guide: neighborhood poisonous plants: Identify, origin, risks, medical response.
- Water cycle and stream study in your neighborhood: from headwater to ocean. Compare natural to channelized streams, compare vegetation and animals, temperatures, water quality, other variables.
- Local Weather 7 days, twice a day: temp, clouds, rains, wind speed/direction, pressure, local wind and rain names
- Coastal study, map a tide pool, identify main seaweeds in your community.

EDCS 433 or EDCS 450 TOTAL POINTS: 100 POINTS EACH

Grading Policy: A = 100-90%, B = 89-80%, C = 79-70%, D = 69-60%
Attendance policy: Absence(s) require make-up activity such as participating in/writing up a community-based project; please discuss with instructor. Active participation is an integral part of the course.
Office Hours: By appointment.

JUNE 9, 2012-MAY 13, 2013 EDCS 433/450 SCHEDULE

Notes:

- 125 hours both courses, 62.5 hours for EDCS 433 or 450 credit course: 1 lecture, 2 lab credits.
- Accommodations can be made for outdoor activities, please discuss with instructor.

- Schedule may change based on weather and other unforeseen events.
- Additional meetings (TBA) will provide content, support, and make up time for missed classes.

June 9, Sat.	**O'AHU: UHS 1-107 Orientation for O'ahu participants**
9-12 p.m.	Sign in, meet Kulia Team, pick up supplies, Risk & Release, medical/dietary info
June 18-22	**KAUA'I IMMERSION (detailed schedule to follow)**
Mon.	**Lihue Airport** arrive by 8:30 a.m.
	Kilauea Lighthouse: sea birds
	Waipa: working ahupua'a, service learning, overnight Hanalei House, Limahuli Hale
Tues.	**Limahuli, NTBG**: biorestoration, overnight Hanalei House, Waipa (tents)
Wed.	**NTBG Kalaheo:** plant conservation, **Kokee overnight**
Thurs.	**Koke'e State Park**: native plants, birds, invasive species, **Kokee overnight**
Fri.	**Salt Ponds**, **Menehune Pond, Nawiliwili Harbor**, marine debris
	Depart Lihue Airport 5-6 p.m.
	Nualolo Kai participants return to Koke'e
Sat: Optional	**Nualolo Kai: 5 a.m.-7 p.m swim in/out, ethnobotany, archeology, service learning**
	Oahu participants return 10 p.m.
	Neighbor Island participants return to Koke'e, return home by noon Sun., June 24
July 6-7	**O'ahu people: UHS 1-107; Neighbor Island participants explore local resources**
Fri.	**National Weather Service, Global Warming, Plate Tectonics** NSF Kahua A'o lessons
	POST 708, UHS1-107
Sat.	**Kalihi Ahupua'a, Mokauea Island: host Jenny Kuwahara** (METC/PVS TBD)
July 13-15	**All Participants to O'ahu: Moanalua Gardens, UHS 1-107, POST 708, FT**
Fri.	**Moanalua Gardens, DLNR:** Maura O'Connor, Michelle Jones, Stephanie Hurder
	UHS1-107: 433 Ahupua'a/Cultural Landscape; **450** Lesson updates, Think/Writes
	Hawaiian Volcanoes: Scott Rowland, Lindsey Spencer (POST 708 or UHS1-107)
Sat.	**All-day SE Oahu FT**: Scott Rowland, Liz Kumabe UHM-Makapu'u- Hanauma Bay
Sun.	Kulia Team: ETEC, DNA extraction, finish reports

DATES BELOW ARE SET: SPECIFIC SITES/ACTIVITIES ON OAHU TO BE CONFIRMED

Oct. 5-7	**All Participants O'ahu Punalu'u Hale** (Kamehameha Schools-Bishop Estate)
Fri.	METC/PVS?: hosts Michelle, Chris, Mahina Hou, Matt
Sat.	Koko Ula Learning Center: Host Matt Kanemoto plant propagation, water tests
Sun.	Presentations and lesson updates, Think/Writes
Jan. 18-20	**All Participants O'ahu Punalu'u Hale** (Kamehameha Schools-Bishop Estate)
Fri.	Maunalua Bay: hosts Michelle, Napua: Kuapa Pond, invasive limu
Sat.	Windward O'ahu geology FT
Sun.	Presentations, lesson sharing
Mar. 22-23	**All Participants on O'ahu Final Presentations**
April 30, 2013	**LAST DAY TO SUBMIT ALL 433/450 ASSIGNMENTS**
May 11, 2013	**GRADES DUE TO OUTREACH COLLEGE**
	FINAL STIPENDS

SELECTED COURSE READINGS ON THE WORLDWIDE WEB

1. An Overview of the Hawaiian Cultural Landscape http://www.kumupono.com/Hawaiian%20Cultural%20Landscape.pdf
2. Hawaiian Kalo, Past and Future http://www.ctahr.hawaii.edu/oc/freepubs/pdf/SA-1.pdf
3. Traditions of O'ahu, Stories of an Ancient Island, by districts (mahalo Dennis Kawaharada) http://apdl.kcc.hawaii.edu/~oahu/stories/winds.htm
4. The Kona Field System http://www.bishopmuseum.org/exhibits/greenwell/kona.html.
5. "Development and Human Activity on the West Coast of the Island of Hawaii" http://www.cr.nps.gov/history/online_books/kona/history6b.htm.
6. Protecting Hawaii from Invasive Species http://www.invasivespeciesinfo.gov/docs/council/HISC%20Presentation.pdf
7. Evolution in Hawaii: A Supplement to Teaching about Evolution and the Nature of Science http://www.nap.edu/catalog.php?record_id=10865
8. An Inquiry Primer, http://www.experientiallearning.ucdavis.edu/module2/el2-60-primer.pdf
9. 5E Instructional Model http://www7.nationalacademies.org/bose/Bybee_21st%20Century_Paper.pdf.
10. Communities of Practice, a Brief Introduction http://www.ewenger.com/theory/
11. Pacific Islanders' Ancestry Emerges in Genetic Study http://www.nytimes.com/2008/01/18/world/asia/18islands.html
12. What is Place-based Education? http://www.promiseofplace.org/what_is_pbe
13. Best of Both Worlds, a Critical Pedagogy of Place http://www.pieducators.com/files/Critical-Pedagogy-of-Place.pdf
14. Next Generation Science Standards http://www.achieve.org/next-generation-science-standards; http://teachscience4all.wordpress.com/2010/03/11/k-12-common-core-standards-english-math/
15. Framework for K-12 Science Standards http://www7.nationalacademies.org/bose/Standards_Framework_Homepage.html

FAQs

1. Teachers (EA, kupuna, substitute teachers, PTT) may enroll for credit and stipend. **No Audits**.
2. More than $600 in stipends in a calendar year are reportable if you are NOT in a degree program.
3. Enroll for A-F grade to apply credits to a degree program; credits expire in 7 years.
4. Enroll Credit/No credit if you do not need A-F but are developing curriculum for your school.
5. Teams from a school or complex are encouraged to enroll.

UH Catalog Description:
EDCS 433 Interdisciplinary Science Curriculum (3 Cr) Conceptual schemes and processes for integrating science curricula within the sciences and with subject areas. Methods and models of curricular integration such as interdisciplinary, culturally relevant, place and community-based learning. Repeatable once.
EDCS 450 Methods and Materials in Science (3 Cr) Selecting and using methods and materials, demonstrations and simulations, open-ended experimentation, inquiry and discover, task analysis measurement tools and techniques, activities from various curricula, opportunity for individualized goals and projects. Repeatable once.

***Kūlia I Ka Nu'u* website: http://manoa.hawaii.edu/coe/kulia/**
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