

SENCERIZING COURSES WINDWARD COMMUNITY COLLEGE

BIOL 100 - David Krupp, Human Biology: Introduction to the biology of the human species. Topics include anatomy and physiology, physical fitness, nutrition, genetics, health, disease, human evolution, and human ecology. Not intended for science majors. 3 credit hours. Includes topics such as: The science of biology, Cell structure and function, Human inheritance, Human organ systems and health, Human evolution, Human environment.

CAPACIOUS ISSUES explored through engagement and corresponding learning outcomes:

1. Apply science to answer a question about phenomena in our natural universe or to determine the validity of a scientific claim. Engagement: Alternative ways to view the universe, for instance the Hawaiian view of nature; and Science versus pseudoscience (Creationism, Astrology, Ancient astronauts, Biorhythms, Blood types and human nutrition ...)
2. Distinguish between living things and inanimate objects. Engagement: Vitalism; Holism versus reductionism; Does evolution produce increasing complexity? Are human beings animals? ...
3. Relate cell structure and function to the architecture and functioning of the human body. Engagement: Eugenics; Human stem cell research and application; GMOs; Nature versus nurture; Genetic basis for racial differences: how different are we? ...
4. Use information about the form (anatomy) and function (physiology) of the human body to make effective decisions about human health. Engagement: Vegetarianism versus eating animal foods; Diet, obesity and diabetes in Hawai'i; Life styles, fitness and human health; AIDs and other sexually transmitted diseases; ...
5. Describe the interrelationships between humans and their environments. Engagement: The ahupua'a and traditional resource management; Invasive species; Climate change; Managing our fisheries; Sustainable energy (and other resources) in an island state; Managing wastes in an island state; GMOs ...

BIOL 100 – Michelle Smith, Human Biology: Introduction to the biology of the human species. (See above)

CAPACIOUS ISSUES explored through key assignments: A PSA project: Design a 1-2 minute Public Service Announcement (video), and a reaction paper and class discussion: Stem cells; vog; GMO; sustainability, biological hazards resulting from ecological interactions; harmful chemicals; epidemics, ... Assessed through analysis of replies to the following assessment questions:

- How did the course make a difference in your involvement in health concerns or sustainability issues?
- Did the course change any of your current and future community engagements? Are you or will you be involved in any civic activities or exhibit any behavioral changes in regards to health or sustainability? For instance, are you planning on participating in any of the following activities: making healthy lifestyle choices, reducing your ecological foot print, environmental restoration, clean energy, improving water quality or usage, waste management (generation and disposal), sustainable agriculture, responsible recreation (flying, boating, driving), and food and land management.
- What activities presented in class stimulated your interest in human biology?

GG 211 – Floyd McCoy, Jr.: Big Island Field Geology: A four-day field course on the island of Hawai'i conducting a survey of Hawaiian volcanic processes illustrated by studying Kilauea, Mauna Kea, Mauna Loa, Hualalai, and Kohala volcanoes.

CAPACIOUS ISSUES: Research methods include an interplay of Hawaiian and contemporary culture with geologic sciences and addresses issues such as contemporary natural hazards – frequency, intensity, mitigation, planning – and the meaning, conduct, and processes of scientific study. Student comments on learning outcomes in relation to engagement: ... perpetuate my culture ... plan to be more vocal ... preserve our culture ... promote healthy lifestyles ... prepare for natural disasters ... participate in community engagements ... more aware / more active / more ecologically friendly / more advocacy ... Implement – Hawaiian practices, sustainable agriculture, recycling, conservation, organic gardening, dedication to education.



SENCER - Science Education for New Civic Engagement and Responsibility

EXAMPLES OF CURRICULUM DEVELOPMENT FOR COURSES AND COMMUNITY ENGAGEMENT PROJECTS IN THE NATURAL AND SOCIAL SCIENCES WITH A STRONG EMPHASIS ON THE UH SYSTEM AS A HAWAIIAN AND PACIFIC PLACE OF LEARNING AND BASED ON COLLABORATION ACROSS DISCIPLINES AND INSTITUTIONS.

THE COURSES AND PROGRAMS SHOWCASED HERE ARE DESIGNED TO TEACH THROUGH COMPLEX, CONTESTED, CAPACIOUS, AND CURRENT PUBLIC ISSUES AND COMMUNITY ENGAGEMENT WITH A FOCUS ON SUSTAINABILITY AND CLIMATE CHANGE ISSUES.

SENCERIZING COURSES AND RESEARCH UNIVERSITY OF HAWAI'I AT MĀNOA

Engineering:

CEE421 – Dr. Oceana Francis, PE: Engineering Hydraulics – Hydraulics of closed conduits and open channels with emphasis on engineering applications. Topics also include pump hydraulics, bridge hydraulics, urban drainage engineering, and flood plain management. Required CEE majors, senior level, 3 credit hours

CAPACIOUS ISSUES: Preliminary Engineering Analysis and Development of Retrofit Designs around sediment Retention at Honokōwai Structure #8, Wahikuli-Honokowai Priority Site. The existing structure—owned and operated by Maui County, Department of Public Works—delivers fine sediment, coarse debris, and other pollutants to coastal waters and coral reefs via two pathways. The CEE 421 class project reevaluates Honokōwai watershed hydrology, original debris basin design parameters, and existing basin characteristics, operations and performance, analyzes potential trapping efficiency and sediment retention for a suite of design alternatives; and evaluate the cost-effectiveness, dam safety ramifications, and hydrologic impacts of various retrofit approaches in reducing basin-delivered sediment loads across a spectrum of future conditions for stream input and basin operations.

ME 213 - Dr. Reza Ghorbani - Introduction to Engineering Design.

CAPACIOUS ISSUES: Wave energy conversion, wind turbines; kites for sailing; projectile motion.

Engineering Undergraduate Research (Dr. Reza Ghorbani) in partnership with: NHSEMP, LSAMP, CoE Dean's Office, CTAHR.

CAPACIOUS ISSUES: Energy maximization of undersea turbines; ocean current energy conversion; wind turbines, Helmholtz ocean energy conversion, ...

Ethnic Studies:

ES320 – Dr. Ulla Hasager – Hawai'i and the Pacific

CAPACIOUS ISSUES: Civic Engagement projects - Climate change in the Pacific; lessons from traditional land use; working with natural sciences; sustainability.

SCIENCE EDUCATION FOR A NEW CIVIC ENGAGEMENT AND RESPONSIBILITY

PROGRAMS AND PROJECTS ACROSS THE CURRICULUM

Interdisciplinary and interinstitutional research and practice
Indigenous practice, knowledge, and value systems

Mālama I Nā Ahupua'a

Mālama i nā Ahupua'a is a service learning program organized and run by instructors with the help of student coordinators and community partners. The Mālama i nā Ahupua'a service-learning program integrates cultural, historic and environmental learning. We help with restoration, maintenance, documentation, and oral history collection. The program works with a number of community partners and sites. We aim to develop a "sense of place" by creating a fund of knowledge and practical experience that bridges several academic disciplines

The Native Hawaiian Initiative

The Native Hawaiian Initiative (NHI), is focused on creating a sense of belonging for students from all disciplines at the College of Social Sciences and focuses on the development of student leaders of Native Hawaiian and Pacific Islander ancestry who will be encouraged to become peer mentors and community advocates on both the collegiate and community level through the MINA, Pālolo Pipeline, Ka Holo Wa'a, and various other programs and outreach opportunities.

SENCER & SUSTAINABILITY IN THE SOCIAL SCIENCES

Pālolo Pipeline Program
Ka Holo Wa'a
Mālama I Nā Ahupua'a

Summer Science - STEM
Waves of Change

SENCER STEM Immersion
SENCER in K-12 Curriculum
Civic Engagement across the curriculum

SENCER IDEALS

SENCER robustly connects science and civic engagement by teaching "through" complex, contested, capacious, current, and unresolved public issues "to" basic science. SENCER invites students to put scientific knowledge and scientific method to immediate use on matters of immediate interest to students. SENCER helps reveal the limits of science by identifying the elements of public issues where science doesn't help us decide what to do. SENCER shows the power of science by identifying the dimensions of a public issue that can be better understood with certain mathematical and scientific ways of knowing. SENCER conceives the intellectual project as practical and engaged from the start, as opposed to science education models that view the mind as a kind of "storage shed" where abstract knowledge may be secreted for vague potential uses. SENCER seeks to extract from the immediate issues the larger, common lessons about scientific processes and methods. SENCER locates the responsibilities (the burdens and the pleasures) of discovery as the work of the student. SENCER, by focusing on contested issues, encourages student engagement with "multidisciplinary trouble" and with civic questions that require attention now. By doing so, SENCER hopes to help students overcome both unfounded fears and unquestioning awe of science.

SENCERIZING ACROSS INSTITUTIONS KAPI'OLANI COMMUNITY COLLEGE

Example – the Teagle Foundation Project led by Kapiolani CC and the Community College National Center for Community Engagement (CCNCCCE), Mesa, AZ and including seven Community Colleges in six states: HI, CA, AZ, LA, NJ, and NY (2 colleges)

COMMON CAPACIOUS QUESTION integrated in first and second year courses that will be basis for rubric assessment and further development: "How do we build OUR commitment to civic and moral responsibility for diverse, equitable, healthy, and sustainable communities?"

Courses engaged at Kapiolani:
Philosophy / "Ethics of Health Care"
Biology / "Ecology & Environment"
Anthropology "Emerging Humanity"
Composition / "Intro to Composition"
Psychology / "Human Development"
Education / "Foundations of Inclusion"
Religion / "Intro to World Religion"
Hawaiian Studies / "Hawaiian History"

Reflection prompts:

- 1) This term, which issue did you focus on: diversity, equity, health, and/or sustainability?
- 2) What were the central course concepts that deepened your understanding of these issues? Show how 3-5 course concepts informed your understanding of these issues.
- 3) In what ways did you continually engage these issues? (examples, lectures, readings, video, freewrites, online resources. online blogs, service-learning, community-based research, undergraduate research, other forms of active learning).
- 4) How did this ongoing engagement deepen your understanding of these issues?
- 5) How will this ongoing engagement impact your personal life, work and career, and community?
- 6) How do you make moral decisions about what is right and wrong in actions you or others take to build diverse, equitable, healthy, and sustainable communities?
- 7) How did this ongoing engagement strengthen your commitment to diverse, equitable, healthy, and sustainable communities?"



PACIOOS buoys in Hawai'i (Hilo Bay, Kiholo Bay, Honolulu) measure water temperature, salinity, chlorophyll a, turbidity and pH

SENCERIZING COURSES AND RESEARCH UNIVERSITY OF HAWAI'I AT HILO

Marine Sciences
MARE 435 – Dr. Lisa Parr: Marine Field Experience for Teachers

Labs and activities using data from NOAA, PACIOOS, and ARC GIS websites, workshops on UHH research vessel.

CAPACIOUS ISSUES and engagement: Tracking Tiger sharks, sea turtles and monk seals and using GIS to display data; comparing water quality data from buoys and making predictions about the impact of storms; using NOAA marine debris survey data to make inferences about currents.

Sociology:

SOC 260 – Dr. Marilyn Brown: Social Problems - Addressing Social Problems in East Hawai'i

CAPACIOUS ISSUES: Students identify social problems and local agencies addressing them. They do research, shed light on the determinants of social problems, address the issues, and assess community-based programs. Issues include child abuse and neglect, prisoner reentry, drug abuse, aging and end of life care, violence against women, teen pregnancy, etc.

Agriculture:

AG 230 – Dr. Norman Arancon: Sustainable Agriculture

CAPACIOUS ISSUES: Sustainable gardening through civic engagement: students are working in the Keaukaha community to design and build a community garden, and create a community seminar and a handbook on sustainable gardening.