

Report of the Mānoa Faculty Senate Critical Thinking Working Group (CTWG)

April 9, 2012

Charge: Issue # 24: “GEC is asked to lead a working group that includes members of CAPP and MAC to study approaches to systematic inclusion and assessment of critical thinking skill development into the curriculum.”

Critical Thinking Working Group Members:

GEC – Jim Caron, Todd Sammons (facilitator)
CAPP – Ekaterina Sherstyuk, Pavel Zinin
MAC – Violet Harada, Peter Hoffmann, Adam Pang
Invited participants – Christine Beaulé (Spanish), Susan Hippensteele (Women’s Studies), Lorey Takahashi (Psychology)

Accreditation background: Our accrediting organization, the Western Association of Schools and Colleges (WASC) has always had in its “Criteria for Review” (2.2) the requirement that its member institutions in their general education programs should pay attention to five important “pillars”: oral communication, written communication, quantitative skills, critical thinking, and information literacy. In the wind lately was WASC requiring that all institutions up for (re)accreditation establish proficiencies for each of these five pillars and demonstrate that students are meeting those proficiencies by the time they graduate. At the latest meeting of the WASC Senior Commission, that recommendation was not voted in. Still, members of the CTWG feel that it would be a very good idea to get ahead of the curve on this pending need to establish proficiencies; indeed, we understand that getting ahead of the critical thinking part of the curve was the main impetus for our working group’s constitution and charge.

Process: We met four times during Fall 2011; we met five times during Spring 2012. Early meetings focused on defining our goals, including which definition of critical thinking we would use. We also decided to undertake a census of the student learning outcomes for all undergraduate majors in order to determine how prevalent critical thinking already is in our curriculum. Finally, we met with Monica Stitt-Bergh and Marlene Lowe of the Assessment Office to share ideas about assessing critical thinking.

Goals: We decided (1) to settle on a working definition of “critical thinking”; (2) to use that working definition to take a census of the SLOs in our undergraduate majors to see how widespread critical thinking might already be in our curriculum; (3) to think about how to do assessment of critical thinking; and (4) to think about how further to improve “critical thinking skill development” throughout the undergraduate curriculum.

Definition of Critical Thinking (Goal #1): Two members of our group (Hippensteele and Takahashi) have been heavily involved in Tennessee Tech’s Critical Thinking Assessment Test (CAT). CAT is a faculty-constructed, nationally normed test that measures 12 behaviors or skills broadly grouped into four categories: evaluating information, creative thinking, learning and problem solving, and communication. The majority of faculty participants in the CAT program agree that at least eight of these twelve behaviors are important elements of critical thinking in their respective disciplines. Because of this broad appeal across disciplinary boundaries, the

Critical Thinking Working Group elected to adopt the 12 skills named by CAT's definition of critical thinking as our operational metric. (For the full list, see Appendix A.)

Student Learning Outcomes (SLO) Census (Goal #2): Members of the working group set out to identify areas of the university's undergraduate curriculum where any of the 12 elements in our working definition of critical thinking are already being addressed. We accomplished this task through a survey of program student learning objectives generally from the 2010 program assessment reports available here:

<http://manoa.hawaii.edu/assessment/update2/view.php?view=years>

(Although some of us used the 2011 program assessment reports, most of us used the 2010 set of reports rather than the 2011 set because more programs had completed theirs for the previous year than had managed to do so by the end of the fall 2011 term. We are also operating under the assumption that program SLOs have changed relatively little from 2010 to 2011.)

Each working group member was assigned a subset of Department Program Assessment Reports to read. We chose to directly copy and paste into our grid of 12 skills language where we believe either a general reference to critical thinking appears, or language that can be interpreted as similar to one or more of the 12 skills, thus giving others the opportunity to weigh in on those subjective interpretations. While we recognize the potential idiosyncrasies of our judgments about these program SLOs, the objective of the exercise was twofold. First, we hoped to gain a broad sense of how thoroughly each of the 12 skills is already being addressed across the university's undergraduate curriculum. Second, we aimed to provide a set of examples of program SLOs that we hope will help faculty in various departments to think about how to more explicitly address some of the skills they identify as being most relevant to their majors' disciplinary training. (For the full census, see Appendix B.)

Assessment of Critical Thinking (Goal #3): We feel that assessment needs to take place on at least two levels, to reflect our understanding that critical thinking itself is both a generalizable skill (that can be measured by a discipline-neutral test like the CAT) as well as a discipline-specific set of skills. We suggest, then, that the Assessment Office identify places in the curriculum common to all undergraduates--i.e., the general education curriculum--where critical thinking is occurring. Additionally, the Assessment Office can help interested departments assess their "brand" of critical thinking. These assessments will be for proficiency by graduation. We do not at this point think that "value-added" assessment of critical thinking is the way to go. That is, we do not think that we need to establish a baseline of critical thinking skills exhibited by entering students, against which we can measure how much their critical thinking skills have improved by the time they graduate.

Recommendations (Goal #4): We think that the Mānoa Faculty Senate should form for next academic year a working group to implement the following recommendations:

1. Create awareness among faculty about the potential WASC requirement that we establish what proficiency in critical thinking means at UH-Mānoa. Key to this effort will be the census that our working group has done, no doubt revised as it is disseminated beyond our group.

2. Work with the Assessment Office to begin assessing critical thinking in the general education curriculum.
3. Work with the Assessment Office to help departments begin to assess critical thinking in their discipline(s). SLOs may need revising; data sources may already exist to determine proficiency: e.g., capstone courses, undergraduate research, Senior Honors projects, directed readings, courses with Contemporary Ethical Issues (E) Focus designations.

Appendix A

Skills Assessed by CAT Instrument*

The CAT Instrument--from which the operational components of critical thinking below stem--is a tool designed to assess and promote the improvement of critical thinking and real-world problem solving skills. The instrument is the product of extensive development, testing, and refinement with a broad range of institutions, faculty, and students across the country. The National Science Foundation has provided support for many of these activities.

Evaluating Information

- Separate factual information from inferences.
- Interpret numerical relationships in graphs.
- Understand the limitations of correlational data.
- Evaluate evidence and identify inappropriate conclusions.

Creative Thinking

- Identify alternative interpretations for data or observations.
- Identify new information that might support or contradict a hypothesis.
- Explain how new information can change a problem.

Learning and Problem Solving

- Separate relevant from irrelevant information.
- Integrate information to solve problems.
- Learn and apply new information.
- Use mathematical skills to solve real-world problems.

Communication

- Communicate ideas effectively.

*Source: <http://www.tntech.edu/cat/home/>

Appendix B

Full Program SLOs Census

Examples of program SLOs that we broadly interpret as relevant to one or more of the 12 skills of critical thinking are grouped below by college. It should be noted that although we attempted to identify as many as we could of the 12 critical thinking skills reflected in the SLOs of each department, some department SLOs may have included only a few or none of the critical thinking skills we were considering. This absence of department critical thinking SLOs may be attributed to different criteria to evaluate critical thinking and not to a department's lack of teaching critical thinking in their undergraduate curriculum.

General references to critical thinking

We identified several programs whose SLOs provide examples of general approaches to imparting critical thinking, or which refer specifically to the phrase "critical thinking" in their program learning outcomes:

Students can generate and test hypothesis, make observations, and collect data in the laboratory and in the field and analyze and interpret these results, derive conclusions, and report their findings. (Ethnobiology)

Students can effectively communicate creative ideas and critical judgments through appropriate means (oral, written, practical). (Theatre)

Critical and creative thinking (Travel Industry Management)

Apply analytical, problem-solving, business management and technological skills to everyday and discipline-related challenges. (Tropical Plant and Soil Science)

Application of critical thinking skills through oral and written assignments designed to engage students to think analytically and help them learn to build increasingly sophisticated arguments. (Women's Studies)

Evaluating Information

The following program SLOs, we believe, are relevant to teaching students one or more of the following skills: how to separate factual information from inferences, interpret numerical relationships in graphs, understand the limitations of correlational data, and evaluate evidence and identify inappropriate conclusions.

College of Arts and Humanities

Critical thinking skills necessary to analyze a variety of cultural artifacts (literature, primary documents, film, music, etc.), as well as historical and present-day sociopolitical issues. (American Studies)

Cross-cultural appreciation and understanding of diverse musical traditions. ..Field experiences and student teaching involves observation, analysis, participation and teaching in classrooms...A knowledge

of music hardware and software that will allow students to define and solve problems specific to music technology. (Music)

Careful reading and interpretation of texts. (Philosophy)

Read and analyze primary source and scholarly articles. (Religion)

College of Languages, Linguistics, and Literatures

Conduct research on German language and/or culture using knowledge and skills learned in the program. (German)

College of Natural Sciences

Generate and test hypothesis, make observations, and collect data in the laboratory and in the field and analyze and interpret these results, derive conclusions, and report their findings. (Botany)

Students can generate and test hypothesis, make observations, and collect data in the laboratory and in the field and analyze and interpret these results, derive conclusions, and report their findings. (Ethnobiology)

Students can generate and test hypothesis, make observations, and collect data in the laboratory and in the field and analyze and interpret these results, derive conclusions, and report their findings. (Ethnobiology)

Students will be able to apply a scientific process - Generate, test, and analyze hypotheses; Students will be able to communicate about biological science - Demonstrate ability to evaluate journal articles from the primary literature. (Marine Biology)

Several mathematical topics at the junior and senior level; develop and write direct proofs, proofs by contradiction, and proofs by induction (Mathematics)

The scientific method of investigation and hypothesis testing including the development of theoretical and practical skills in the design and execution of experiments. (Microbiology)

College of Social Sciences

Apply appropriate quantitative and statistical techniques to economic analysis. Conduct economic analysis using equations and graphs. (Economics)

Student will be able to apply appropriate analytic methods to describe spatial patterns and associations in the human environment. (Geography)

Students will be able to explain and critically evaluate the complex relationship between the environment, society, and culture. (Geography)

Student will be able to apply appropriate analytic methods to describe spatial patterns and associations in the human environment. (Geography)

Gather, analyze and organize information, and to communicate it clearly, effectively and responsibly using multiple media platforms (Journalism)

Demonstrate skepticism and attunement to scientific evidence; evaluating aptness of research conclusions. (Psychology)

Shidler College of Business

Be critical thinkers who are capable of identifying business opportunities by using cutting-edge analytical tools and problem-solving skills to start new businesses and implement processes to successfully operate these businesses. (Entrepreneurship)

Identify appropriate metric measurements of human capital. (Human Resources)

Students will identify and describe various comparative national risks within the context of analysis of Asia-Pacific settings. (Management, Marketing)

Students will be able to evaluate the costs/benefits of applying technology in business. (Management, Marketing)

College of Engineering

Ability to design and conduct experiments, as well as analyze and interpret data (Civil Engineering)

Demonstrated ability to design and conduct experiments as well as interpret data (Computer Engineering)

Knowledge of probability and statistics, including examples relevant to Electrical Engineering (program criteria). Knowledge of mathematics through differential and integral calculus, basic sciences, and engineering sciences necessary to analyze and design complex devices and systems containing hardware and software. Knowledge of advanced mathematics, including differential equations, linear algebra, complex variables, and discrete mathematics (program criteria). (Electrical Engineering)

An ability to design and conduct experiments, analyze, and interpret data. (Mechanical Engineering)

College of Tropical Agriculture and Human Resources

The student can employ critical thinking, creativity, and technical skill mastery to prepare a substantive pre-employment portfolio appropriate for an emerging industry professional. (Apparel Design)

Know, apply and critically analyze and evaluate concepts related to the science of food and nutrition with a focus on humans. (Food Science/Human Nutrition)

NREM students will have a broad understanding of the environmental sciences and be able to apply scientific methods in managing natural resource systems and solving environmental problems. (Natural Resource Management)

John. A Burns School of Medicine

Competency skills ... include pre-analytical (e.g., specimen procurement, preparation, equipment calibration), analytical (e.g., analysis, instrument operation, quality control), and post-analytical (e.g., reporting, follow up). 2. Knowledge includes principles of analyses, sources of errors, correlations, interpretations, managing unexpected outcomes, communications. (Medical Technology)

School of Nursing and Dental Hygiene

A competent nurse engages in ongoing self-directed learning and provides care based on evidence supported by research... competency one must continuously update their knowledge using reliable, current sources of information from the biological, social, medical, public health, and nursing sciences. The nurse uses legitimate sources of evidence for decision-making such as research evidence, standards of care, community perspectives and practical wisdom gained from experience. As “best practices” are continuously modified and new interventions are constant, the nurse incorporates changes into practice. (Nursing).

School of Pacific and Asian Studies

Have basic research and analytical skills commensurate with class level and to be able to present and communicate in a classroom setting those skills (Asian Studies)

School of Ocean and Earth Science and Technology

Students use the scientific method to define, critically analyze, and solve a problem in earth science. (Geology/Geophysics)

Students use the scientific method to define, critically analyze, and solve a problem in earth science. (Geology/Geophysics)

Creative Thinking

The following SLOs, we believe, provide good examples of how departments are addressing these three critical thinking skills: identify alternative interpretations for data or observations, identify new information that might support or contradict a hypothesis, and explain how new information can change a problem.

College of Arts and Humanities

A basic appreciation of different scholarly approaches to American Studies. (American Studies)

Respond critically to ideas advanced by others. (Philosophy)

College of Languages, Linguistics, and Literatures

Students develop advanced skills as readers, writers, and interpreters of texts across a variety of genres and rhetorical situations; [students] recognize Hawai'i's geographic and cultural location in the Pacific as part of a challenging program in literary and cultural studies, English language studies, composition and rhetoric, and creative writing; Students develop advanced skills as readers, writers, and interpreters of texts across a variety of genres and rhetorical situations. (English)

Analyze and critique texts written in German from a variety of genres and contexts. (German)

Analyze and interpret works of Japanese poetry, prose, and drama, read both in translation and in the original Japanese, using terms appropriate to each genre. (Japanese)

College of Natural Sciences

Communicate about biological science; Apply a scientific process. (Biology)

Identify and analyze scientific problems and environmental issues using oral and written communication skills; Generate and test hypothesis, make observations, and collect data in the laboratory and in the field and analyze and interpret these results, derive conclusions, and report their findings; Describe how all scientific knowledge is continually developing and is dynamic; students can find new information and compare it with existing information. (Botany)

Students can generate and test hypothesis, make observations, and collect data in the laboratory and in the field and analyze and interpret these results, derive conclusions, and report their findings; Describe how all scientific knowledge is continually developing and is dynamic; students can find new information and compare it with existing information. (Ethnobiology)

Develop and write direct proofs, proofs by contradiction, and proofs by induction; follow and explain algorithms. (Mathematics)

Generate, test, and analyze hypotheses. (Zoology)

College of Social Sciences

Become knowledgeable about disorders and differences across severity levels, age groups, and SES backgrounds (Communication Sciences/Disorders)

Students will be able to apply appropriate analytical methods and techniques to describe spatial patterns and change in the physical environment; students will be able to identify the specific characteristics of spatial data sources; students will be able to explain and critically evaluate how economic, political, and cultural processes at different scales are reshaping human experiences globally; students will be able to describe how human activities can influence the functioning of basic environmental systems. (Geography)

Demonstrate an understanding of the social, cultural and historical contexts of reporting on social institutions as well as on individuals and groups. (Journalism)

Shidler College of Business

Identify the pros and cons associated with using different sources to attract job candidates to a company. (Human Resources)

Students will describe how national cultures influence business practices and relationships; students will explain IT usage across different business processes and functions. (Management, Marketing)

College of Engineering

Demonstrate an understanding of the impact of engineering solutions in a global, economic, environmental, and societal context. (Computer Engineering)

An ability to identify, formulate, and solve engineering problems. (Mechanical Engineering)

Tropical Agriculture and Human Resources

Read and be able to analyze scientific or technical papers critically. (Animal Science)

The student can conduct evaluations of apparel product quality using industry standards, regulatory agency criteria, and appropriate industry terminology. (Apparel Design)

Design and conduct experiments to gather information for engineering designs; Design a system, component, or process in which biology plays a significant role; Design and conduct experiments to gather information for engineering designs. (Biological Engineering)

Know, apply and critically analyze and evaluate concepts related to the science of food and nutrition with a focus on humans. (Food Science/Human Nutrition)

School of Pacific and Asian Studies

Understanding critical differences between Asia and “the West” as well as amongst Asian societies. (Asian Studies)

Learning and problem solving

This category includes the following four critical thinking skills: how to separate relevant from irrelevant information, integrate information to solve problems, learn and apply new information, and use mathematical skills to solve real-world problems.

College of Arts and Humanities

Constructively critique their own and other’s intellectual and creative work. (Creative Media)

Effective oral and written communication skills that demonstrate critical thinking ability and understanding of dance concepts and related topics. (Dance Theatre)

Learn to write scholarly materials including research papers, essays, etc. (Religion)

College of Languages, Linguistics, and Literatures

Conduct independent research on topics in Chinese literature and/or linguistics, and effectively communicate the results. (Chinese)

Students develop advanced skills as readers, writers, and interpreters of texts across a variety of genres and rhetorical situations. (English)

Analyze and demonstrate understanding of major French literary, philosophical, and artistic works, genres, periods, and topics. Conduct research on the language, literature, and/or culture of France and the French-speaking world using knowledge and skills learned in the program; Engage in writing in French in various contexts and for various audiences, using correct grammar and demonstrating appropriate vocabulary, tone, and style for the context. (French)

Demonstrate a familiarity with the current events, traditional and pop culture, and social structures of the society/societies in which German is spoken. (German)

Situate and evaluate Japanese literature in its social, historical, intellectual, and religious contexts; Conduct independent research on topics in Japanese literature and/or linguistics, and effectively communicate the results. (Japanese)

Conduct research on language and/or culture using knowledge learned in the program. (Phillini? Filipino? Language and Literature)

Evaluate and make use of research into the learning, use, structure, and pedagogy of second languages; Develop and apply sound frameworks in the assessment and evaluation of institutions involved in second language instruction, planning, and policy. (Second Language Studies)

College of Natural Sciences

Demonstrate expertise in contemporary research methods; Describe how all scientific knowledge is continually developing and is dynamic; students can find new information and compare it with existing information. (Botany)

Understand the basic structures of atoms, ions, and molecules, and ways to quantitatively describe the properties of atoms and molecules in the various phases of pure matter and in mixtures; Understand the reactivity of atoms, ions, and molecules, and the various qualitative and quantitative methods for describing or depicting chemical reactions; Understand the concept of chemical equilibrium, and the energies that drive chemical reactions: an introduction to the field of thermodynamics; Understand the chemical kinetics and the energy required to initiate a chemical reaction; Understand the relationship

between the electronic configurations of atoms and molecules and their chemical properties: an introduction to the field of quantum mechanics. (Chemistry)

Students can apply knowledge of computing and mathematics appropriate to the discipline; Students can analyze a problem, and identify and define the computing requirements appropriate to its solution; Students have an understanding of professional, ethical, legal, security and social issues and responsibilities. (Computer Science)

An ability to identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems; An ability to assist in the creation of an effective project plan. (Information and Computer Science)

Describe how all scientific knowledge is continually developing and is dynamic; students can find new information and compare it with existing information; Students can identify and analyze scientific problems and environmental issues using oral and written communication skills. Students can generate and test hypothesis, make observations, and collect data in the laboratory and in the field and analyze and interpret these results, derive conclusions, and report their findings. (Ethnobiology)

Students will be able to apply a scientific process - Generate, test, and analyze hypotheses; Students will be able to communicate about biological science - Demonstrate ability to use scientific journals, periodicals, and electronic media to access current biological information. (Marine Biology)

Follow and explain algorithms; apply mathematics to other fields. (Mathematics)

College of Social Sciences

Integrate academic, clinical and research experiences; develop a multicultural focus toward issues of intervention and diagnosis. (Communication Sciences/Disorders)

Demonstrate the ability to apply economic reasoning to contemporary social issues and policy problems; Apply appropriate quantitative and statistical techniques to economic analysis. Conduct economic analysis using equations and graphs. (Economics)

Students will be able to explain and critically evaluate the complex relationship between the environment, society, and culture. 1b) students will be able to explain and critically evaluate how economic, political, and cultural processes at different scales are reshaping human experiences globally; students will be able to describe how human activities can influence the functioning of basic environmental systems; students will be able to produce maps in a professional manner. (Geography)

Gather, analyze and organize information, and to communicate it clearly, effectively and responsibly using multiple media platforms. (Journalism)

Design and conduct basic studies. (Psychology)

Displays an ability to collect and analyze relevant data. (Sociology)

Shidler College of Business

Analyze multinational companies' operations in depth, drawing from concepts in these areas: cross-cultural management, international marketing, and international finance. (International Business)

Analyze best human resource management practice in a selected HRM function; Identify the pros and cons associated with using different sources to attract job candidates to a company; Identify and explain federal laws and judicial decisions that give direction to HRM policies. (Human Resources)

Apply ethical frameworks to a business situation; identify different ethical frameworks that can be applied to business situations; students will be able to use IT to conduct quantitative data analysis. (Management, Marketing)

College of Education

Designs and provides meaningful learning experiences; Uses active student learning strategies; Adapts to the learner; Fosters parent and school community relationships; Fosters effective communication in the learning environment. (Elementary Education)

Students will demonstrate knowledge of anatomical, physiological, biomechanical, and psychological principles of how the body moves in relation to space, time, and distance. (Kinesiology and Rehabilitation Science)

College of Engineering

An ability to design a system, component or process to meet a need within realistic constraints; an ability to apply knowledge of mathematics, science and engineering. (Civil Engineering)

Demonstrated ability to design a system or component that meets desired needs within realistic constraints; knowledge of math. . . necessary to analyze and design complex devices and systems containing hardware and software. (Computer Engineering)

Demonstrated an ability to design a system or component that meets desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability; Knowledge of probability and statistics, including examples relevant to Electrical Engineering (program criteria). Knowledge of mathematics through differential and integral calculus, basic sciences, and engineering sciences necessary to analyze and design complex devices and systems containing hardware and software. Knowledge of advanced mathematics, including differential equations, linear algebra, complex variables, and discrete mathematics (program criteria). (Electrical Engineering)

A recognition of the need and an ability to engage in life-long learning; An ability to apply knowledge of mathematics, science, and engineering. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice. (Mechanical Engineering)

Tropical Agriculture and Human Resources

Understand the scientific method and design of experiments to test hypotheses and as such experience the process of discovery; Develop problem-solving skills for lifetime learning. (Animal Science)

The student can integrate knowledge of industry operations, theories of consumer behavior and quantitative skills to prepare comprehensive research-based manufacturing and merchandising plans that include creative design components and typical industry documents based on quantitative data. (Apparel Design)

Solve physics problems involving mechanics, electromagnetic, and optics; chemistry problems involving inorganic and organic chemistry; problems involving general- and micro-biology; Solve engineering problems related to statics, dynamics, fluid mechanics, and thermodynamics; Design a system, component, or process in which biology plays a significant role; Use modern engineering techniques, skills, and tools to define, formulate, and solve engineering problems; Solve problems involving differential equations. (Biological Engineering)

Demonstrate creativity, critical thinking, problem solving skills, competency is using state of the art scientific instrumentation, self-confidence, and communication skills in a student research symposium. (Plant and Environmental Biotechnology) Develops problem-solving and critical thinking skills; Know, apply and critically analyze and evaluate concepts related to the science of food and nutrition with a focus on humans. Recognizes and uses appropriate technologies, such as computer applications and/or food and nutrition laboratory methodologies. Develops problem-solving and critical thinking skills; Develop written & oral skills commensurate with the ability to summarize, evaluate, synthesize, and appropriately communicate scientific concepts to a variety of audiences. (Food Science/Human Nutrition)

Broaden social perspectives through exposure to diverse culture and thinking in course work, service projects, and departmental or college seminars. (Natural Resource Management)

Be able to apply their knowledge and technical skills to solve problems in the production and management of plants and soil-plant relationships using diverse approaches and technologies. (Tropical Plant and Soil Science)

School of Nursing and Dental Hygiene

A competent nurse demonstrates clinical judgment/critical thinking in the delivery of care of clients while maintaining safety through... Analysis and integration of available data; Implementation of prioritized care based on evaluation of data. Evaluation and analysis of the nurse's personal clinical performance. A competent nurse engages in risk reduction activities, recognizes, communicates and intervenes to promote client safety. (Nursing)

School of Ocean and Earth Science and Technology

Students can explain the relevance of geology and geophysics to human needs, including those appropriate to Hawaii, and be able to discuss issues related to geology and its impact on society and

planet Earth. Students can apply technical knowledge of relevant computer applications, laboratory methods, field methods, and the supporting disciplines (math, physics, chemistry, biology) to solve real-world problems in geology and geophysics. Students can evaluate, interpret, and summarize the basic principles of geology and geophysics, including the fundamental tenets of the sub-disciplines, and their context in relationship to other core sciences, to explain complex phenomena in geology and geophysics; Students use the scientific method to define, critically analyze, and solve a problem in earth science; Students can reconstruct, clearly and ethically, geological knowledge in both oral presentations and written reports. (Geology/Geophysics)

School of Social Work

Engage, assess, intervene, and evaluate with individuals, families, groups, organizations, and communities. (Social Work)

Communication

This category refers to the skills necessary to communicate ideas effectively.

College of Arts and Humanities

Competence in scholarly writing and oral communication. (American Studies)

Constructively critique their own and other's intellectual and creative work. (Creative Media)

Ability to understand, embody, analyze and communicate structural details of movement; Effective oral and written communication skills that demonstrate critical thinking ability and understanding of dance concepts and related topics. (Dance)

Ability to create original work that effectively communicates creative intent and demonstrates clear understanding of choreographic tools and production elements. (Dance Theater)

College of Languages, Linguistics, and Literatures

Apply critical thinking and rhetorical skills to produce coherent written works and presentations in both English and Chinese. (Chinese)

Engage in oral communication in German in various communicative contexts (e.g., everyday conversations, ordering in a restaurant, participating in class discussions, making a short presentation).4. Engage in writing in German in various contexts and for various audiences (e.g., personal letters, emails, essays, etc.). (German)

Engage in oral communication in Japanese in various social contexts, in linguistically and culturally appropriate ways. Apply critical thinking and rhetorical skills to produce coherent written works and presentations in both English and Japanese. (Japanese)

Analyze, evaluate, and critique texts written from a variety of genres and contexts. (Phillini? Filipino? Language and Literature)

College of Natural Sciences

Define and describe the evolution, anatomy, morphology systematics, generics, physiology and ecology of plants. Describe the unique ecological and evolutionary features of the Hawaiian flora. Identify and analyze scientific problems and environmental issues using oral and written communication skills. Generate and test hypothesis, make observations, and collect data in the laboratory and in the field and analyze and interpret these results, derive conclusions, and report their findings. (Botany)

Students can function effectively on teams to accomplish a common goal; Students can communicate effectively with a range of audiences. (Computer Science)

Students will be able to communicate about biological science. (Marine Biology)

College of Social Sciences

Be able to communicate effectively with clients, client's families and caregivers, and other professionals. (Communication Sciences/Disorders)

Develop expertise needed to effectively communicate results of economic research and analysis to colleagues and decision-makers through written reports and oral presentations. (Economics)

Gather, analyze and organize information, and to communicate it clearly, effectively and responsibly using multiple media platforms. (Journalism)

Demonstrate effective writing, oral communication skills and quantitative literacy. (Psychology)

Shows acceptable writing skills. (Sociology)

Shidler College of Business

Communicate clearly and effectively using both written and oral forms of communication, to develop and evaluate business plans and funding proposals. (Entrepreneurship)

Describe environmental differences between business within domestic and international contexts. Communicate their understanding that international business requires management of complex organization. Describe the impact of global environment on multinational companies in both domestic and foreign markets. (International Business)

Students will give an effective oral presentation. Students will write an effective report. (Management, Marketing)

College of Engineering

An ability to communicate effectively. (Civil Engineering)

Demonstrate an ability to communicate effectively (written and oral). (Computer Engineering)

Demonstrated an ability to communicate effectively (written and oral). (Electrical Engineering)

An ability to communicate effectively. (Mechanical Engineering)

Tropical Agriculture and Human Resources

Communicate clearly both orally and in writing. (Animal Science)

Intelligently discuss contemporary issues. (Biological Engineering)

Demonstrate effective written and oral communication skills. (Natural Resource Management)

School of Nursing and Dental Hygiene

A competent nurse communicates and uses technology effectively. (Nursing)

Hawai‘inuiākea School of Hawaiian Knowledge

Present information, concepts, and ideas to an audience of listeners at an intermediate level of fluency and accuracy; Present information, concepts, and ideas to an audience of readers in a variety of simple written forms about familiar topics grounded in personal experience/interests and practical/social need using intermediate vocabulary, expressions, and structures to meet various practical writing needs. (Hawaiian)

School of Social Work

Engage in policy practices to advance social and economic well-being and to deliver effective social work services. (Social Work)