



INTERDISCIPLINARY PROGRAMS

Aging and Gerontology

Degrees and Certificates Offered: Undergraduate Certificate in Aging, BA in interdisciplinary studies (emphasis on aging), Advanced Certificate in Gerontology

See the “John A. Burns School of Medicine” section of the *Catalog* for more information.

Communication and Information Sciences

Department of Information and Computer Sciences
 POST 305G
 1680 East-West Road
 Honolulu, HI 96822
 Tel: (808) 956-3493
 Fax: (808) 956-3548
 Email: cis-chair@hawaii.edu
 Web: www.hawaii.edu/cis

Graduate Faculty

- D. Suthers, PhD (Chair)—human-computer interaction: cognitive, social and computational perspectives on designing and evaluating software for learning, collaboration, and community
- N. Asato, PhD—Japanese/Japanese American print cultures; Asian librarianship; censorship
- K. Baek, PhD—computer vision, neural computation, machine learning
- E. S. Biagioni, PhD—networking protocol design

- K. A. Binsted, PhD—artificial intelligence, software design for mobile devices, human-computer interaction
- T. X. Bui, PhD—electronic commerce, information policy
- H. Casanova, PhD—high performance computing, distributed systems
- H. M. Chen, PhD—e-business, service engineering, business-IT alignment, electronic customer relationship management, multimedia database systems, software engineering, enterprise architecture, MIS
- D. Chin, PhD—artificial intelligence, natural language processing, user modeling, intelligent agents, intelligent user interfaces, intelligent software maintenance, empirical evaluation, geographic information systems
- W. G. Chismar, PhD—information technology, telecommunications, medical informatics
- M. E. Crosby, PhD—human-computer interaction, cognitive science, interface design for searching
- E. J. Davidson, PhD—social cognitive aspects of information systems development methods
- D. Davis, PhD—social impact of communication technologies and computer-based services, communication and gender, gendered applications of telecommunication technologies
- G. M. Fontaine, PhD—intercultural and organizational communication
- R. S. Gazan, PhD—social aspects of information technology
- V. H. Harada, PhD—library management, information literacy
- C. S. Ikehara, PhD—biometrics and physiological sensors, adaptive human-computer interfaces
- S. Y. Itoga, PhD—database systems, expert systems, logic programming, information and computer sciences
- P. Jacso, PhD—digital libraries, webometrics, database content evaluation
- P. M. Johnson, PhD—software engineering, high-tech entrepreneurship
- R. Kazman, PhD—software engineering, human-computer interaction
- T. Kelleher, PhD—public relations, online media, communication campaigns, mass communication, organizational communication
- J.-I. Kim, PhD—communication research methods, communication theories, diffusion of innovations
- R. Knuth, PhD—information policy, children’s materials, international librarianship, history of the book and libraries
- D. M. Nahl, PhD—human-computer interaction, affective computing, information literacy, driving informatics
- D. Pager, PhD—compiler theory, theory of computability, artificial intelligence
- R. R. Panko, PhD—risks in information systems, organizational communication and technology

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- J. Patriarche, PhD—image and signal processing algorithms applied to clinical medical image analysis
- G. Poisson, PhD—cognitive informatics, bioinformatics, machine learning
- D. Port, PhD—software economics, management information systems, software engineering
- L. Quiroga, PhD—information filtering systems, virtual collaboration, information retrieval, databases, library systems
- N. Reed, PhD—artificial intelligence, autonomous agents
- S. Robertson, PhD—human-computer interaction, digital government and digital democracy
- J. Stelovsky, DrTechSc—computer hypermedia, human-computer interaction, cognitive science
- S. Still, PhD—bioinformatics/theoretical biology, information theory, machine learning
- D. Streveler, PhD—medical informatics, international public health, issues in the electronic medical record and in telemedicine
- K. Sugihara, DrEng—algorithms, distributed computing and database systems, visual languages
- D. J. Wedemeyer, PhD—telecommunication policy and planning, new media and society, forecasting methods and application in communication development in Asia and the Pacific
- A. Wertheimer, PhD—information science, library history, Japanese-American print culture
- R. G. Worthley, PhD—statistics, information technology management

Cooperating Graduate Faculty

- J. C. Ady, PhD—organizational communication, sojourner adjustment, international negotiation, conflict management
- D. L. Alden, PhD—marketing communications
- A. R. Arno, PhD—ethnography of communication, communication and law, social theory, news media
- D. Ashworth, PhD—learning technology
- R. W. Brislin, PhD—intercultural communication
- T. J. Brislin, PhD—mass communications, ethics
- R. Doktor, PhD—international business, organizational behavior, strategy
- C. P. Ho, PhD—instructional technology
- M. K. Lai, PhD—research methods
- M. P. McGranaghan, PhD—computer cartography, geographical information systems
- N. Ordway, PhD—real estate
- J. R. Wills, DBA—technology marketing
- S. Zhang, PhD—quantitative research methodology, statistics

Degree Offered: PhD in communication and information sciences

The Academic Program

The Interdisciplinary Doctoral Program in Communication and Information Sciences (CIS) offers a PhD degree integrating and drawing faculty from the fields of communication, computer science, library and information science, and management information systems. Because of the broad knowledge base required to support this interdisciplinary approach, the program also draws on such fields as political science, economics, engineering, operations research, and behavioral sciences.

Recipients of the PhD will undertake careers in colleges and universities, industry, government, and private organizations.

Complete details on this program are outlined on the website, www.hawaii.edu/cis.

Admission Requirements

- Master's degree in business administration, communication, library and information science, information and computer sciences, or a closely related field
- GRE or GMAT scores
- Three letters of recommendation
- Knowledge of elementary statistics and at least one computer programming language
- Statement of research objectives
- Essay on interdisciplinary studies

Applicants from foreign countries must be academically qualified, proficient in English, and financially self-sufficient.

Minimum TOEFL scores of at least 600/250/100 (paper/computer/Internet based TOEFL) are required for admission.

Program Requirements

The student will select three areas of emphasis from the following eight: communication and information theories, communication policy and planning, computer software systems, data communications, human-computer interaction, information storage and retrieval, management information systems, and organizational communication.

Students must pass comprehensive exams in three areas of emphasis, publish a research paper, and complete and defend an original dissertation.

Course Requirements

Regardless of area of emphasis, students are required to complete the following three core courses with a grade of at least a B:

- CIS 701 Communication/Information Theories of Society
- CIS 702 Communication/Information Technologies
- CIS 703 Communication/Information Research Methods

All students are required to be enrolled every semester while in residence in CIS 720 Interdisciplinary Seminar in Communication and Information Sciences, and to receive credit for the seminar.

Courses to be taken in preparation for the comprehensive exams are to be selected from among the courses listed below and from graduate offerings in related disciplines as directed by the student's advisory committee.

Communication/Information Theories

- COM 611 Communication Theories (3)
- COM 633 Information and Communication Technologies (3)
- COM 660 ICT Policy and Planning (3)
- ECON 606 Microeconomic Theory I (3)
- ECON 607 Macroeconomic Theory I (3)
- POLS 610 Political Theory and Analysis (3)
- SOC 611 Classical Sociological Theory (3)
- SOC 612 Contemporary Sociological Theory (3)
- SOC 711 Seminar in Sociology of Knowledge (3)

Communication Policy and Planning

- COM 633 Information and Communication Technologies (3)
- COM 634 New Communication and Information Services (3)
- COM 643 Intercultural Communication (3)

COM 644 Global Communication and Journalism(3)
 COM 660 ICT Policy and Planning (3)
 PLAN 600 Public Policy and Planning Theory (3)
 POLS 630 International Relations (3)
 POLS 635 Topics in International Relations (3)
 POLS 640 Comparative Politics (3)
 POLS 645 Politics and Development: Regional (3)
 POLS 670 Introduction to Public Policy (3)
 POLS 675 Topics in Public Policy (3)

Computer Software Systems

ICS 611 Compiler Theory and Construction (3)
 ICS 612 Theory of Operating Systems (3)
 ICS 613 Advanced Software Engineering (3)
 ICS 621 Analysis of Algorithms (3)
 ICS 622 Systems Modeling and Evaluation (3)
 ICS 641 Advanced Theory of Computation (3)
 ICS 661 Advanced Artificial Intelligence (3)
 ICS 681 Computer Graphics (3)
 ICS 691 Topics in Software (3)

Data Communications

ICS 451 Data Networks (3)
 ICS 651 Computer Networks (3)
 EE 449 Computer Communication Networks (3)
 EE 668 Telecommunication Networks (3)

Human Computer Interaction

ICS 464 Human Computer Interaction I (3)
 ICS 664 Human-Computer Interaction II (3)
 ICS 665 User Interfaces and Hypermedia (3)
 ICS 667 Advanced HCI Design Methods (3)
 ICS 668 Social Informatics (3)
 LIS 677 Human Dimension in Information Systems (3)

Information Storage and Retrieval

ICS 321 Data Storage and Retrieval (3)
 ICS 421 Database Systems (3)
 ICS 461 Artificial Intelligence (3)
 LIS 663 Basic Database Searching (3)
 LIS 667 Advanced Database Searching (3)
 LIS 670 Introduction to Information Science and Technology
 (3)
 LIS 671 Digital Librarianship
 LIS 675 Database Content Evaluation

Management Information Systems

BUS 630 Managing Information Technology for Strategic
 Advantage (3)
 ITM 660 Current Topics in Information Systems (3)
 ITM 704 Doctoral Seminar in Information Systems (3)

Organizational Communication

COM 623 Strategic Organizational Communication (3)
 COM 643 Intercultural Communication (3)
 MGT 670 International Management and Industrial Relations
 (3)
 SOC 613 Organizational Analysis (3)

Environmental Studies

Degrees and Certificates Offered: Undergraduate Certificate in Environmental Studies, BA in interdisciplinary studies (emphasis on environmental studies)

See the “Colleges of Arts and Sciences” section of the *Catalog* for more information.

Global Health and Population Studies

Office of Public Health Studies
 John A. Burns School of Medicine
 Biomedical Sciences D104A
 1960 East West Road
 Honolulu, HI 96822
 Tel: (808) 956-5757, 956-5745
 Fax: (808) 956-5818
 Email: popstudy@hawaii.edu
 Web: www.populationstudies.hawaii.edu

Graduate Faculty

T. Tamulis, PhD (Director)—epidemiology and environmental health
 C. M. Douglas, PhD—urban and regional planning
 T. Halliday, PhD—economics
 S. J. La Croix, PhD—economics
 H. R. Lee, PhD—speech
 S. H. Lee, PhD—economics
 Y. J. Lee, PhD—sociology
 J. Maddock, PhD—public health sciences
 A. Mason, PhD—economics
 S. Millman—sociology
 G. Russo, PhD—economics
 C. Stephenson, PhD—political sciences

Affiliate Graduate Faculty

L. J. Cho, PhD—sociology and economics
 R. Retherford, PhD—sociology
 P. Xenos, PhD—sociology

Certificate Offered: Interdisciplinary Graduate Certificate in Global Health and Population Studies.

The Academic Program

The Global Health and Population Studies Program (GHAPS) is an interdisciplinary graduate certificate program jointly offered by the University of Hawai‘i and the East West Center. The Population Studies Program was established in 1969, and its name and curriculum was modified in 2009 to include training in global health concepts and methodology. The mission of GHAPS is to promote scholarship in global health and population studies, to develop evidence-based practical solutions, and to promote health for all through accessible interdisciplinary education and training, research, service, and community partnership.

Global health is defined by the Institute of Medicine as “health problems, issues and concerns that transcend national

boundaries, may be influenced by circumstances or experiences in other countries, and are best addressed by cooperative actions and solutions.” The discipline of global health is concerned with developing theories and methods to understand the roots of social, economic, political, and environmental determinants of health, with a focus on the nature of health inequalities. The program explores the effects of globalization, environmental change, macroeconomic policy, and culture on population health and population demography. GHAPS uses a systems approach to study social, demographic, political, environmental, and economic change in the contemporary world, and the association between these global changes and such global health issues as fertility, communicable, and non-communicable diseases, maternal and child health, migration and humanitarian assistance, population growth, aging, and sustainable development. The subject matter is addressed from an interdisciplinary perspective with an emphasis on policy-oriented study and research.

Given the location of the East-West Center and UH Manoa and the expertise of its faculty, the graduate program emphasizes policies and issues of importance in the Asia-Pacific region. The program’s curriculum draws on the strengths of its interdisciplinary faculty, who represent such disciplines as public health, sociology, demography, economics, tropical medicine, geography, anthropology, political science, and urban and regional planning. GHAPS seeks to prepare students for careers in international health and health policy, population studies and demographic methods, and interdisciplinary academic research.

Certificate Requirements

The interdisciplinary Graduate Certificate in Population Studies consists of 16 credits of course work, earning a grade of more than B- in any course, and a capstone project or comprehensive examination.

Specific Requirements are:

- A core of three courses (7 credits), Introduction to Human Population (PPST 650/ PH 651/SOC 650, 3 credits), Introduction to Global Health (PPST 690/ PH690, 3 credits), and Interdisciplinary Seminar (PPST 649/ PH 652, 1 credit)
- Three courses numbered 600 or above (9 credits) selected from any of the 7 focus areas (epidemiologic and demographic research methods; global health and sustainable development; ecology and health; population and economics; aging; social mobility and spatial dynamics; marriage, family, and fertility). Students may choose to enroll for Directed Reading and Research (PPST 699) when undertaking their capstone project. Up to 3 credits of PPST 699 can be applied to the 9-credit requirement. On petition, the program director may accept 600-level courses or above that are not listed within any of the seven focus areas. The program director may also accept up to 3 credits of 400-level course. Courses taken for credit may be applied to both a graduate degree and the interdisciplinary certificate.
- A capstone project. Either a research paper of publishable quality on a global health and/or population topic, a grant proposal with the student as principal author, or other capstone project with the prior written approval of the director of the program. At the end of their project, students must

present their results in a seminar. It is the responsibility of the student to identify an appropriate faculty member to serve as an academic advisor of his or her capstone project. The program director then appoints the faculty advisor in consultation with the student and the proposed faculty advisor. The capstone project will be evaluated by a three-member assessment committee, consisting of the faculty advisor and two additional faculty members appointed by the program director in consultation with the student. Students may also choose to take a comprehensive exam in lieu of a capstone project.

- **Comprehensive Examination.** The comprehensive examination consists of six questions, and at least four of the six questions must be answered in order to successfully complete the exam. The written examination will be followed by an oral discussion. The exam questions will be broad in scope and assume basic knowledge of the concepts, substance, methods, and techniques used in global health and population studies. The answers will be evaluated based on the effective integration of previous material and coursework, plausible arguments, and reflective statements.

Thematic Clusters in Global Health and Population Studies

Global health and population studies consists of a core of seven major themes or key topics: global health and sustainable development; global environmental change, ecology and health; marriage, family, and fertility; aging; social mobility and spatial dynamics; population and economics; and demographic research methods. Each of these themes is conceived as an overlapping circle to emphasize the exchange of information and ideas on contemporary global health issues and human population demography, based on interdisciplinary courses and seminars in population studies, social sciences, and public health sciences.

Global Health and Sustainable Development focuses on trends in morbidity and mortality and their relationship to political, social, and economic change. The module emphasizes behavioral determinants of health, the effects of income and education, gender and race, and health policy. In addition, it addresses the effects of illness on individual outcomes, e.g., educational attainment and earnings, and on aggregate development, e.g., urbanization and growth on GDP. An important topic is the emergence of HIV/AIDS and other infectious diseases, maternal and child health, nutrition, global environmental change, and special population groups, such as immigrants and displaced people, humanitarian assistance and disaster management. Various policy prescriptions are considered; including critical review of health care delivery systems worldwide, implementing vaccination campaigns and other public health or preventative care services, and improving education. Close attention is paid to the importance of reproductive health in lowering fertility and infant mortality rates as well as in thwarting the spread of sexually-transmitted diseases. The module emphasizes the important role that women play in improving health in the developing world. Critical topics also include the debate over ‘sustainable development’ and the impact of population growth on land use, marine resources, air quality, water, and global climate change. A final emphasis of the module is on the disparities in health outcomes: across rich and poor

individuals, across the developed and developing world, as well as across races, genders, and indigenous population groups.

Global Environmental Change, Ecology, and Health provides interdisciplinary understanding of contemporary global environmental problems and issues (e.g., global warming, ozone depletion, acid rains, and changes in human-coupled natural ecosystem) and the effect of global environmental and ecosystem changes on human health. The module emphasizes natural and man-made ecosystem changes and emerging infectious diseases, global warming effect on natural ecosystems and human health, and critical understanding and systems thinking skills required to understand the principles of transdisciplinary research.

Marriage, Family, and Fertility The institutions of marriage, the family, and the household are crucial in demographic processes and are at the center of broader social and economic change as well. This module examines these key institutions from economic, sociological, and other perspectives, with particular attention to their roles in shaping demographic systems. Families and households allocate resources among its members and across time. In so doing, they influence the level and distribution of mortality and morbidity, education, and other components of well-being. The family is central to reproduction and the replacement of populations. The module considers factors underlying levels of reproduction in technologically less-developed societies and societies with modern demographic regimes, and examines the place of these institutions in recognized variations in long-term transitions from one to the other. These institutions are also central to the recent trend in many societies toward very low fertility. The same institutions are important to our understanding of migration patterns. Attention is given to ways that families and households influence the residential changes of individuals.

Aging addresses the processes of individual aging and population aging. The first of the two foci considers the evolution of health, employment, earnings and assets, living arrangements, and other individual characteristics that vary with age. Close attention is paid to the inter-relationships among these characteristics, differences in these processes both across countries and across demographic groups within countries, and the implications of public policy, e.g., retirement and pension policy. The second of the module's two foci discusses how societies are affected by and cope with an aging population. It discusses how societies look after the financial and personal well-being of their retired and disabled constituents as well as how societies provide medical care to their citizens as their health atrophies. A particular emphasis is on the systems of support, both public and private, that provide housing, consumption, medical care for the elderly and disabled, and how systems vary across the developed and developing worlds.

Social Mobility and Spatial Dynamics focuses on the spatial dynamics of societies with particular attention to issues of internal and international migration and the size and other characteristics of places from the village community to the mega-urban region. Population movement within and between countries consists of a variety of forms of mobility associated with physical resource endowments, historical social and economic development, demographic systems, and public policy.

The literatures of demography and other social sciences also consider the characteristics of migrants and migrant streams.

Population and Economics addresses the connections between population change and the economy at both the aggregate and individual level. What are the implications for slowing population growth and changing age structure for economic growth, poverty, and other macroeconomic variables? How are marriage, childbearing, living arrangements, and other demographic behaviors responding to and influencing economic circumstances? How are labor force decisions by women, retirement behavior, and other employment decisions influenced by demographic factors?

Demographic Research Methods provides additional training in the concepts and techniques of demographic analysis, such as: (1) methods of collecting valid and reliable information about population, such as survey design and sampling method, and (2) methods of analyzing data which are available in the field of demography, such as survival analysis, multi-stage/multi-regional demography, and other state-of-the-art statistical techniques for data analysis.

Graduate Interdisciplinary Specializations

Graduate specializations offer graduate students the opportunity to complete a course of study utilizing courses and faculty from several different fields. Participants must apply for admission and be admitted to a 'regular' graduate program.

Ecology, Evolution, and Conservation Biology

Snyder 407
2538 McCarthy Mall
Honolulu, HI 96822
Tel: (808) 956-4602
Fax: (808) 956-4707
Email: eecb@hawaii.edu
Web: www.hawaii.edu/eecb/



Graduate Faculty

- R. H. Cowie, PhD (Chair)—evolutionary biology and conservation of land and freshwater snails
- L. Arita-Tsutsumi, PhD—behavioral ecology of insects
- W. W. Au, PhD—sensory biology of cetaceans
- C. Birkeland, PhD—coral reef ecology and management, marine community ecology
- B. Bowen, PhD—phylogeography, evolution and conservation, genetics of marine vertebrates
- R. L. Cann, PhD—conservation genetics and molecular evolution
- D. Carlon, PhD—population regulation, life-history evolution and speciation
- K. S. Cole, PhD—evolution of sexual patterns, behavioral ecology
- S. Conant, PhD—conservation biology, life history and ecology of Hawaiian birds
- C. C. Daehler, PhD—invasive plants, plant-insect interactions

J. A. Davidson, PhD—ecology of plant diseases in natural ecosystems
 M. J. deMaintenon, PhD—evolution of gastropod organogenetic patterns
 D. Drake, PhD—plant ecology, conservation biology, plant-animal interactions
 D. C. Duffy, PhD—conservation biology (basic and applied)
 L. A. Freed, PhD—evolutionary ecology, behavioral ecology and conservation biology
 M. G. Hadfield, PhD—larval biology of marine invertebrates, conservation and demography of Hawaiian tree snails
 D. Haymer, PhD—molecular evolution
 B. S. Holland, PhD—molecular ecology, systematics and conservation genetics
 T. Hunt, PhD—evolutionary theory, including ecology and biogeography
 T. Idol, PhD—forest soils and nutrient cycling
 K. Y. Kaneshiro, PhD—sexual selection and biology of small populations
 D. D. Kapan, PhD—evolution and genetics of warning color and mimicry in Lepidoptera and applied evolutionary ecology and molecular population genetics
 S. C. Keeley, PhD—plant molecular systematics and evolution
 R. A. Kinzie, PhD—aquatic ecology, coral reefs and tropical streams
 C. A. Lepczyk, PhD—wildlife ecology, landscape ecology, human dimensions of natural resources
 C. M. Litton, PhD—ecosystem ecology and biogeochemistry of forested systems
 T. W. Lyttle, PhD—population genetics and chromosome evolution
 W. J. Mautz, PhD—environmental physiology, environmental toxicology, ecological energetics, respiration physiology, and herpetology
 M. D. Merlin, PhD—biogeography, ethnobotany, Pacific natural history
 C. W. Morden, PhD—molecular systematics and evolution of plants and algae
 R. Ostertag, PhD—community structure and nutrient dynamics of tropical forests
 J. D. Parrish, PhD—ecology of aquatic (marine) communities, fishery biology
 D. K. Price, PhD—evolutionary genetics of behaviors
 M. A. Ridgley, PhD—human-environment systems analysis: modeling and evaluation of society-environment interactions
 D. Rubinoff, PhD—insect systematics, conservation biology, and the evolution of ecological traits
 A. R. Sherwood, PhD—evolution, systematics and population genetics of Hawaiian algae
 C. M. Smith, PhD—physiological ecology of marine macrophytes, marine ecology
 L. E. Sponsel, PhD—human ecology in tropical forests and deforestation
 J. S. Stimson, PhD—population ecology
 A. D. Taylor, PhD—population ecology
 A. Teramura, PhD—environmental stress physiology, global climate change, ecosystem analysis and biodiversity
 T. Ticktin, PhD—ethnoecology and conservation
 R. Toonen, PhD—population biology and larval ecology of marine invertebrates
 T. Tricas, PhD—behavior and sensory biology of sharks, rays and reef fishes
 L. Wester, PhD—plant geography, biogeography of islands, human-plant relationships

B. A. Wilcox, PhD—natural resource management, ecology of infectious diseases
 C. Womersley, PhD—environmental physiology, biochemical adaptation, parasitology

Affiliate Graduate Faculty

A. Allison, PhD—systematics and population biology
 L. V. Basch, PhD—ecology, evolution and conservation of marine life histories and benthic communities
 N. L. Evenhuis, PhD—systematics and evolution of Diptera
 A. M. Friedlander, PhD—nearshore fisheries
 F. G. Howarth, PhD—evolutionary biology of cave ecosystems and insect conservation
 L. L. Loope, PhD—conservation biology, plant ecology
 J. E. Maragos, PhD—human impact on marine ecosystems and coral reefs
 D. Ragone, PhD—Pacific Island ethnobotany, especially conservation and use of traditional crops, focusing on breadfruit

The Academic Program

The objectives of the interdisciplinary graduate specialization in ecology, evolution, and conservation biology (EECB) are to:

- Use the unique opportunities that Hawai'i offers to integrate tropical population biology and natural history studies with modern laboratory techniques;
- Provide the interdisciplinary, conceptual, and technical training that will allow our graduates to participate in academic and research programs in ecology, evolution, and conservation biology; and
- Foster scholarly training in research programs involving expertise in ecology, evolution, and conservation biology.

Modern theories of ecology, evolution, and conservation biology share a core of concepts and techniques that span classical academic disciplines. This common core, coupled with the emergence of powerful new technologies, invites cross-disciplinary approaches, which generate many of today's most exciting scientific advances.

The EECB program provides opportunities for students at UH Mānoa to expand their knowledge and gain experience in this integrative discipline. Our interdisciplinary graduate program brings together faculty members from agronomy and soil science, anthropology, biomedical sciences (genetics and molecular biology), botanical sciences, entomology, geography, horticulture, microbiology, oceanography, and zoology—with all their skills and technologies—to provide the training students need to contribute effectively to this research area.

EECB is implemented as a “specialization” within existing graduate programs of the departments whose faculty participate in this program. This means that the primary duties and responsibilities of each EECB student are to satisfy the requirements of their own home academic department. The EECB specialization serves to allow students to expand beyond the traditional departmental boundaries in terms of formulating research questions, choosing thesis/dissertation committee members and taking academic courses. EECB graduate students can be enrolled in either the doctor of philosophy or master of science degree in their home department.

Students accepted to the EECB graduate specialization must already have been accepted into the graduate program of

the various departments participating in the EECB program. Course work in statistics, organic chemistry, biochemistry, genetics, evolution, and ecology are considered most important for admission into the EECB program.

Details on the EECB program and application forms can be found at the EECB website www.hawaii.edu/eeeb/.

Admission Procedures and Policy

All applicants must submit:

- UH Mānoa graduate application, including
 - Results of the Graduate Record Examination
 - Copy of official transcripts (UH Mānoa to be included if applicant is an existing student)
 - Three letters of recommendation
 - Statement of career goals

All applicants must also submit (in this case directly to the EECB office):

- Letter expressing your interest in EECB (up to 3 pages), including, at a minimum
 - information on past academic experience
 - goals for graduate study in general and graduate study in EECB in particular
 - what you feel you can contribute to EECB
 - what you expect to gain by participation in EECB
- Letter of support from your EECB faculty sponsor

Only students who have been accepted by a graduate program in one of the academic departments at UH Mānoa can be considered for admission to the EECB program.

New students applying to UH Mānoa

Regardless of department admission deadlines, the EECB program deadline is **February 1** for admission the following fall semester.

If you are applying for admission to EECB you must enter “EECB” in addition to the academic program to which you are applying (Zoology, Botany, etc.) in the box labeled “intended graduate program” on your original UH application. The Graduate Division will automatically forward your entire application (including the letters of recommendation) to the department you are applying to, and it will then be forwarded to EECB if you are accepted into that department. You do not need to submit a copy directly to EECB.

In addition, you should also submit, in this case directly to the EECB office, a letter specifically expressing your interest in EECB (see above for what it should include).

Your EECB faculty sponsor should also submit a letter of support, directly to the EECB office.

Students already at UH Mānoa

Students already at UH Mānoa may be admitted to EECB in either the fall or spring semester. The deadline for applications for admission in the fall semester is **February 1** and for admission in the spring semester is **October 15**.

Your original UH Mānoa application will be obtained directly by the EECB office from the Graduate Division and does not need to be submitted with your application to EECB.

You should submit, directly to the EECB office, a letter expressing your interest in EECB (see above for what it should include). In addition, if you have been a UH Mānoa student for

more than two semesters, you should have three new reference letters submitted directly to the EECB office by the application deadline.

Your EECB faculty sponsor should also submit, directly to the EECB office, a letter of support.

Admission criteria

Details can be found on the EECB website: www.hawaii.edu/eeeb/.

Course Requirements for Specialization in Ecology, Evolution and Conservation Biology

Course requirements for ALL EECB graduate students:

- Complete all degree requirements of the home academic department
- Participate in EECB activities, particularly the Evoluncheon seminar series
- One course in ecology at the 600 or 700 level (at least 2 credits with an A or B grade)
- One course in evolution at the 600 or 700 level (at least 2 credits with an A or B grade)
- One course in conservation biology at the 600 or 700 level (at least 2 credits with an A or B grade)

Acceptable graduate (600-700 level) courses currently being offered are listed below. Because some offerings change from semester to semester, consult the EECB webpage for an updated list.

In addition to course requirements for the specialization in EECB, each academic department has its own course requirements. Courses from the EECB course list that are taken to fulfill departmental requirements can also be used to fulfill EECB requirements, however, a single course can only satisfy one of the three EECB requirements.

Course Offerings

(Updated October 2009)

(New courses or one-time offerings not listed here but approved by the EECB curriculum committee may also count towards the ecology, evolution, or conservation biology requirement. Please check with the EECB website and consult with the graduate education committee.)

Ecology

- ANTH 606 Anthropology of Infectious Disease (3)
- BOT 644 Ethnoecological Methods (3)
- BOT 651 Invasion Biology (3)
- BOT/ZOOL 652 Population Biology (3)
- BOT 676 Environmental Physiology Seminar (2)
- IS 650 Principles of Applied Evolutionary Ecology (3)
- MICR 680 Advances in Microbial Ecology (3)
- NREM 680 Ecosystem Ecology (3)
- NREM 682 Restoration Ecology (3)
- NREM 691 (001) Landscape Ecology (V)
- PEPS 671 Insect Ecology (3)
- OCN 626 Marine Microplankton Ecology
- OCN 627 Ecology of Pelagic Marine Animals (3)
- OCN 628 Benthic Biological Oceanography (4)
- OCN 629 Molecular Methods in Marine Ecology (2)
- ZOOL 606 Principles of Animal Behavior (2)
- ZOOL 606L Principles of Animal Behavior Lab (1)



- ZOOL 620 Marine Ecology (3)
- ZOOL 623 Quantitative Field Ecology (3)

Evolution

- ANTH 604 Physical Anthropology (3)
- BOT 661 Hawaiian Vascular Plants (3)
- BOT 669 Molecular Systematics and Evolution (3)
- CMB 625 Advanced Topics in Genetics (2)
- CMB 650 Population Genetics (3)
- MICR 671 Bacterial Genetics (3)
- PEPS 662 Systematics and Phylogenetics (3)
- PEPS 691 Biogeography Seminar (2)
- TPSS 615 Quantitative Genetics (3)
- ZOOL 487 Molecular Ecology (3)
- ZOOL 606 Principles of Animal Behavior (2)
- ZOOL 606L Principles of Animal Behavior Lab (1)

Conservation Biology

- ANTH 620H Human Ecology (3)
- BOT 651 Invasion Biology (3)
- BOT/ZOOL 690 Conservation Biology (3)
- GEOG 752 Research Seminar: Resource Management (3)
- GEOG 758 Research Seminar: Conservation (3)
- OCN 621 Biological Oceanography (3)
- PEPS 675 Biological Control of Pests (3)
- TCBES 600 (UH Hilo) Conservation Biology and Environmental Science (3)

Content Varies (but may be count towards a specific area, depending the topic)

- ANTH 620 Theory in Social and Cultural Anthropology (3)
- BOT 612 Advanced Botanical Problems (V)
- BOT 654 Advances in Plant Ecology (2)
- GEOG 750 Research Seminar: Biogeography (3)
- ZOOL 714 Topics in Animal Behavior (V)
- ZOOL 719 Topics in Systematics and Evolution (V)
- ZOOL 739 Topics in Ecology (V)
- ZOOL 750 Topics in Conservation Biology (V)

Marine Biology

c/o Hawai'i Institute of Marine Biology (HIMB)

P.O. Box 1346

Kaneohe, HI 96744

Tel: (808) 236-7401

Fax: (808) 236-7443

Web: www.soest.hawaii.edu/oceanography/marbiol.html

Graduate Faculty

J. Leong, PhD (Chair)—HIMB

M. Alam, PhD—microbiology

M. J. Atkinson, PhD—oceanography/HIMB

W. W. L. Au, PhD—HIMB

J. H. Bailey-Brock, PhD—zoology

R. Bidigare, PhD—HIMB

C. Birkeland, PhD—zoology

B. Bowen, PhD—HIMB

R. Cann, PhD—genetics

S. Conant, PhD—zoology

I. Cooke, PhD—zoology

H. G. de Couet, PhD—zoology

S. Donachie, PhD—microbiology

J. Douglas, PhD—microbiology

R. Gates, PhD—HIMB

G. Grau, PhD—zoology

K. Holland, PhD—HIMB

T. D. Humphreys, PhD—biochemistry

C. Hunter, PhD—biology

D. Jameson, PhD—biochemistry

P. Jokiel, PhD—HIMB/zoology

D. Karl, PhD—oceanography

S. Karl, PhD—HIMB

R. Kinzie III, PhD—zoology

P. E. Nachtigall, PhD—HIMB

M. Rappe, PhD—HIMB

K. Selph, PhD—oceanography

C. Smith, PhD—botany

G. Steward, PhD—biological oceanography

J. Stimson, PhD—zoology

F. Thomas, PhD—HIMB

R. Toonen, PhD—HIMB

T. Tricas, PhD—zoology

G. Wang, PhD—oceanography

The Academic Program

The marine biology specialization is a UH Mānoa-wide program focusing on recent advances in the understanding of marine systems at the ecological, organismic, and cellular-molecular levels. Students can select courses, advisors, and research opportunities from a wide range of specialties, including: marine botany, ecology, genetics, virology, microbiology, zoology, aquaculture, behavioral biosystematics, biological oceanography, coral reef biology, fisheries, and molecular biology.

The marine biology specialization is available to graduate students in botany, microbiology, oceanography, and zoology. Prospective graduate students must apply first to one of these programs. Applications from students who have been accepted

to botany, microbiology, oceanography, or zoology who have also indicated a desire to specialize in marine biology are reviewed by the Marine Biology Admissions Committee.

Students specializing in marine biology supplement the courses required for a degree in their chosen field with courses specific to marine biology. The actual selection is determined by the student in consultation with his or her advisor. Graduate student research is carried out in the laboratories of the graduate faculty. These include laboratories in Edmondson Hall, Snyder Hall, the St. John Laboratory (botanical sciences), the Marine Science Building, the Hawai'i Institute of Marine Biology (located on Coconut Island in Kaneohe Bay), the Bekesy Laboratory, and the Kewalo Laboratory of the Pacific Biomedical Research Center. Research capabilities include DNA sequencing using PCR technology; video and acoustic recording for ecological and behavioral studies of coral reef and planktonic organisms; transmission and scanning electron, ultraviolet, and light microscopy; electrophoretic analysis; flow cytometry; and radioisotope tracer studies.

Selected Courses:

- ANSC 450 Aquaculture Production (3)
- BOT 480 Algal Diversity and Evolution (4)
- BOT 680 Marine Macrophytes Seminar (2)
- OCN 450 Aquaculture Production (3)
- OCN 621 Biological Oceanography (3)
- OCN 626 Marine Microplankton Ecology (4)
- OCN 627 Ecology of Pelagic Marine Animals (4)
- OCN 628 Benthic Biological Oceanography (4)
- OCN 750 Topic in Biological Oceanography (V)
- ZOOL 466 Fisheries Science (3)
- ZOOL 467 Ecology of Fishes (3)
- ZOOL 475 Biology of Invertebrates (3)
- ZOOL 620 Marine Ecology (3)

Neurosciences Graduate Program

John A Burns School of Medicine
BSB 222
651 Ilalo Street
Honolulu, HI 96813
Tel: (808) 692-1514
Fax: (808) 692-1968
Web: www.hawaii.edu/cmb

Graduate Faculty

M.J. Berry, PhD (Co-chair)—selenoprotein synthesis
M. Gerschenson, PhD (Co-chair)—infectious diseases, HIV mitochondrial medicine

Biochemistry

D. M. Jameson, PhD—energetics and dynamics of protein interactions; fluorescence spectroscopy
K. Kumashiro, PhD—solid-state nuclear magnetic resonance
S. E. Seifried, PhD—molecular recognition and transcriptional control
A. G. Theriault, PhD—molecular biology of lipid metabolism and heart disease

A. Yanagihara, PhD—biochemistry of neurotoxins, neuroactive compounds in cnidarians

Cancer Biology

A. Bachmann, PhD—biology of membrane proteins in cancer
R. V. Cooney, PhD—carcinogenesis
T. Donlon, PhD—molecular diagnostics of cancer
D. C. Fritzinger, PhD—natural products and cancer biology
A. F. Lau, PhD—oncogenes, cellular transformation and signal transduction
L. Le Marchand, MD, PhD—cancer epidemiology, breast cancer risk
P. S. Lorenzo, PhD—diacylglycerols and their participation in carcinogenesis and malignant transformation
J. Ramos, PhD—MAP kinase pathway
C-W. Vogel, MD, PhD—biochemistry of cellular toxins, neuroblastoma
R. K. Wada, MD—molecular oncology, oncogene regulation, tumor differentiation

Cell Signaling

A. Fleig, PhD—excitation-contraction coupling in muscle
R. Penner, MD, PhD—calcium signaling in neurons and immune cells
H. Turner, PhD—molecular biology of ion channels in the immune and nervous system

Developmental Biology

R. Allsopp, PhD—cell biology
H. G. de Couet, PhD—neurogenetics, cytoskeleton, cell motility
M. G. Hadfield, PhD—settlement and metamorphosis of marine invertebrate larvae
T. D. Humphreys, PhD—immune system of sponges, evolutionary foundations of animal immunity, molecular biology of hemichordates
S. Lozanoff, PhD—developmental biology and craniofacial development
M. Martindale, PhD—cellular, molecular and evolutionary basis of biological pattern formation
E. Seaver, PhD—segment polarity signals in annelids

Genetics and Molecular Biology

M. J. Berry, PhD—selenoprotein synthesis
F. Bellingr, PhD—neurobiology of selenoproteins
R. L. Cann, PhD—molecular and evolutionary genetics of animal populations
M. Gerschenson, PhD—infectious diseases, HIV mitochondrial medicine
D. S. Haymer, PhD—molecular genetics of Diptera
P. Hoffmann, PhD—selenoproteins as related to immunology and cardiac disease
C. Jourdan Le Saux, PhD—human genetic disorders, asthma, interleukins and pulmonary function
O. Le Saux, PhD—genetic disorders, elastin, PXE, gene mapping
T. W. Lyttle, PhD—structure of *Drosophila* heterochromatin, evolution of chromosomal rearrangements
G. K. Ostrander, PhD—biochemical oncology and marine biology
J. Panee, PhD—selenoproteins and natural products as antioxidants
S. Robinow, PhD—neurogenetics
J. F. Scott, PhD—yeast DNA replication
A. J. Stokes, PhD—cardiac immunology and cell and molecular biology
Z. Stoytcheva, PhD—molecular biology of selenoproteins

Geriatrics

P. Blanchette, MD, MPH—diseases of old age, Alzheimer's disease
K. Masaki, MD—geriatric medicine

Immunology/Virology

S. M. Callahan, PhD—bacterial genetics
S. P. Chang, PhD—immunology, molecular approaches to vaccine development
Y. Lu, PhD—retrovirology, herpes virus, infections in marine organisms
V. R. Nerukar, PhD—viral pathogens, marine virology, molecular epidemiology
P. Patek, PhD—cellular immunity
E. Tam, MD—mast cell proteases, asthma, and immunology
K. Yamaga, PhD—immunological mechanisms of disease
R. Yanagihara, MD—viral pathogens, molecular phylogeny, emerging infections

Matrix Pathobiology

K. Csiszar, PhD—lysyl oxidase tumor suppressor family

Medicine

R. Shohet, MD—cardiovascular research
B. T. Shiramizu, MD—pediatrics

Neurobiology/Neurophysiology

D. C. Blanchard, PhD—psychopharmacology and neurobiology of behavior
R. J. Blanchard, PhD—experimental ethology and ethnopharmacology
I. Cooke, PhD—cellular neurobiology, peptidergic neurons in culture
D. K. Hartline, PhD—small network neurophysiology
M. D. Rayner, PhD—sodium channel control mechanisms
L. K. Takahashi, PhD—behavioral neuroscience

Plant Molecular Physiology

D. Borthakur, PhD—regulation of genes in the rhizosphere bacteria by root exudates
J. Hu, PhD—molecular biology of plant viruses

Reproduction Function

G. Bryant-Greenwood, PhD—molecular and cell biology of human fetal membranes and decidua
Y. Marikawa, PhD—molecular control of the body plan of vertebrate embryos
M. Ward, PhD—biology of reproduction
W. S. Ward, PhD—tertiary structure of DNA, nuclear structure, and genetic instability
R. Yanagimachi, MD, DSci—mammalian germ cells, assisted reproduction, cloning and transgenesis

Degrees Offered: MS in biomedical sciences (cell and molecular biology), PhD in biomedical sciences (cell and molecular biology)

The Academic Program

The Cell and Molecular Biology Program (CMB) in biomedical sciences represents an interdisciplinary approach to graduate education with faculty in many sub-disciplines of biology dedicated to helping qualified students pursue original research using modern approaches to cell and molecular biology. The CMB program brings together faculty from

three colleges and various research institutes. Planning for collaborative research is emphasized in this program, as well as solid training in a variety of laboratory techniques.

The CMB program provides fellowships for PhD students in their first year, and additional support in the way of research or teaching assistantships are available for qualified applicants in subsequent years. The program is intended to prepare students for careers in academia, research institutes, and in expanding areas of biotechnology in the private sector.

Master's students fall into two categories, depending on whether they opt for a Plan A (thesis) or Plan B (non-thesis). The MS Plan B is usually a terminal degree, appropriate for professionals in medical technology, government, and related fields who wish to obtain broad training in modern genetics to advance their credentials in their chosen fields. The completion of the MS Plan A serves as a qualifying examination for students who intend to continue toward the PhD in cell and molecular biology. It may also serve as a terminal degree for those who wish to pursue careers as research technicians, either in the public or private sector.

Advising

For complete details regarding the program, contact Lyn Hamamura at msbiosci@hawaii.edu or visit the website at www.hawaii.edu/cmb.

Graduate Study

Applicants are expected to have at least a bachelor's degree emphasizing biological or physical sciences with courses in calculus, organic chemistry, biochemistry, genetics, and cellular and molecular biology. Applicants with MD degrees are welcome. Results of the Graduate Record Examination (GRE) general test should be submitted with the application, and students whose native language is not English are required to take the Test of English as a Foreign Language (TOEFL). Three letters of recommendation from former instructors or research supervisors, a CMB program graduate express form, and transcripts from previous universities or colleges attended must also be submitted.

Master's Degree

The curriculum core of the CMB program is a specialized lecture class, spanning two semesters (CMB 621-622). Additional required courses are CMB 611 Seminar in Biomedical Science and CMB 626 Ethics in Biomedical Research. The remaining credit requirements can be fulfilled by specialized courses, seminars, and research units as recommended by the particular committee and research advisor each student picks to guide their academic program. Following the completion of the two semester core course, the student is expected to pass a qualifying exam, form a committee, and then propose, complete, and defend an original research project (MS Plan A) or study plan and research paper (MS Plan B).

Doctoral Degree

PhD candidates do not need to have completed a master's degree. If an MS was not earned through the CMB program, the core lecture class is required (CMB 621-622). Formal course requirements beyond the core include additional courses specified by the dissertation committee, including CMB 611

Seminar in Biomedical Science, CMB 626 Ethics in Biomedical Research and three laboratory rotations. The student is expected to form a committee, propose, complete, and defend an original research project and publish at least one paper in a peer-reviewed journal during their graduate career.

Selected Specialized Courses

Cell Biology

- MBBE 620 Plant Biochemistry
- TPSS 614 Molecular Genetics of Crops
- TRMD 604 Infectious Disease Micro I
- TRMD 671 Advanced Medical Parasitology
- TRMD 690 Seminar in Tropical Medicine and Public Health
- ZOOL 610 Topics in Development and Reproductive Biology

Molecular Biology

- CMB 625 Advanced Topics in Genetics
- CMB 654 Genetics Seminars
- MICR 625 Advanced Immunology
- MICR 671 Bacterial Genetics
- MBBE 680 Methods in Plant Molecular Biology
- MBBE 691 Advanced Special Topics in MBBE

Neurobiology

- CMB 606 Introduction to Neurosciences
- CMB 705 Special Topics in Neuroscience
- PHYL 606 Human Neurophysiology
- ZOOL 712 Topics in Nerve/Muscle Physiology

Interdisciplinary Studies

Degree Offered: BA in interdisciplinary studies

See the “Colleges of Arts and Sciences” section for more information.

International Cultural Studies

UHM/EWC International Cultural Studies Graduate Certificate Program

Burns Hall Rm 2069
1601 East-West Road
Honolulu, HI 96822
Tel: 808-944-7593
Fax: 808-944-7070
Email: culture@hawaii.edu
Web: www2.hawaii.edu/~culture

Faculty

W. Dissanayake, PhD (Director)—media studies
C. Andrade, PhD—Hawaiian studies
A. Arno, PhD—anthropology
C. Bacchilega, PhD—English
T. Bigalke, PhD—EWC education
E. Buck, PhD—EWC
G. Chan, PhD—art and art history
M. Chapman, PhD—geography
M. Das Gupta, PhD—ethnic studies
K. Ferguson, PhD—political science and women’s studies
C. Franklin, PhD—English
C. Fujikane, PhD—English
V. Gonzalez, PhD—American Studies
T. Gonzalves PhD—American Studies
N. Goodyear-Ka’opua, PhD—political science
J. Goss, PhD—geography
D. Grace, PhD—education
J. Hamilton, PhD—art and art history
D. Hanlon, PhD—history
M. Helbling, PhD—American studies
J. Henry, PhD—English
V. Hereniko, PhD—Pacific Island studies
P. Ho, PhD—ethnic studies
P. Hoffenberg, PhD—history
R. Hsu, PhD—English
K. Kane, PhD—political science
J. Kaomea, PhD—curriculum studies
N. Kent, PhD—ethnic studies
M. Koikari, PhD—women’s studies
K. Kosasa, PhD—American studies
F. Lau, PhD—music
J. Logan, PhD—languages and literatures of Europe and the Americas
L. Lyons, PhD—English
P. Lyons, PhD—English
R. Mabanglo, PhD—Philippine studies
B. Murton, PhD—geography
R. Nettell, PhD—English
J. Okamura, PhD—ethnic studies
J. Osorio, PhD—Hawaiian studies
K. Pauka, PhD—theater
R. Perkinson, PhD—American studies
R. Rath, PhD—history
S. Reiss PhD—history
J. Rieder, PhD—English
A. Robillard, PhD—sociology
M. Shapiro, PhD—political science

S. Shankar, PhD—English
 M. Sharma, PhD—Asian studies
 N. Sharma, PhD—ethnic studies and sociology
 N. Silva, PhD—political science
 C. Sinavaiana, PhD—English
 N. Soguk, PhD—political science
 R. Sullivan, PhD—English
 T. Tengan, PhD—ethnic studies and anthropology
 R. Trimillos, PhD—Asian studies
 M. Wessendorf, PhD—theatre and dance
 T. Wesley-Smith, PhD—Pacific Island studies
 E. White, PhD—ethnic studies
 G. White, PhD—EWC and anthropology
 H. Wood, PhD—English (HPU)
 C. Yano, PhD—anthropology
 M. Yoshihara, PhD—American studies
 M. Yue, PhD—East Asian languages and literatures
 J. Zuern, PhD—English

Certificate Offered: Graduate Certificate in International Cultural Studies

The Academic Program

The Graduate Certificate in International Cultural Studies offers an interdisciplinary course of study that enhances existing degrees in Arts and Sciences, area studies, and the professional schools.

Given that the language of culture is increasingly heard in debates about issues as diverse as nationalism, human rights, immigration, trade, the environment, education, media, and the arts, the certificate program develops tools for a more informed and critical understanding of the role of culture in public debates and policy.

Hawai'i's location at the intersection of local, U.S. and Asian spheres of influence provides an important vantage point from which to take up the social and cultural transformations taking place in today's era of economic globalization and restructuring. Issues of cultural identity and politics are sharply drawn in the distinctive mix of indigenous, local and international communities in Hawai'i today. Program courses and activities support a variety of approaches to analyzing and understanding the significance of culture, and of cultural difference, as global flows of people, culture, and capital increase the heterogeneity and flux of everyday life throughout the world.

The certificate program brings together faculty whose research and teaching focus on the politics and production of culture in the context of local, national, and international relations. Faculty research methods and styles emphasize the interpretive approaches of the humanities and social sciences.

Certificate Requirements

The certificate program combines course work with directed research and, where possible, community involvement.

- A core of three courses (7 credits), including:
 - International Cultural Studies: History and Theory (CUL 610)
 - Faculty Seminar Series (CUL 609)

- International Cultural Studies: Research Project (CUL 750). The Capstone Experience is an individual research project supervised by a participating faculty member.
- Three electives (9 credits), including two taken outside the student's department and no more than one undergraduate course.

Peace Studies

Degrees and Certificates Offered: Undergraduate Certificate in Peace Studies, BA in interdisciplinary studies (emphasis on peace studies). See the "Colleges of Arts and Sciences" section for more information.

Resource Management

Saunders Hall 107
 2424 Maile Way
 Honolulu, HI 96822
 Tel: (808) 956-7381

Certificate Offered: Graduate Resource Management Certificate

The Academic Program

The Graduate Resource Management Certificate is a cooperative program primarily involving the College of Social Sciences, the Department of Urban and Regional Planning (anthropology, economics, geography), the College of Tropical Agriculture and Human Resources (natural resources and environmental management), and the East-West Center (Program on Environment, Program on Resources: Energy and Minerals). Because of its diverse topical components, multidisciplinary faculty, and practical application throughout Asia and the Pacific, the program is ideal for students who are pursuing graduate studies in traditional disciplines and also seeking expertise in environmental resource management.

This program provides students with specialized training in an area that augments their primary field and develops their pragmatic problem-solving and decision-making skills through analysis of real-world problems. Any student who has previously been admitted as a classified graduate student at UH Mānoa is eligible to apply for admission to this certificate program. Interested applicants should contact their advisor or any representative of the program in the collaborating departments and institutions.

To earn this certificate, students are expected to complete 15 credit hours, at least 9 of which are at the graduate level. For more information, contact the Department of Urban and Regional Planning.