

List of Courses

Special notations used are as follows:

1. 101, 102 = a year's sequence in which 101 is not prerequisite for enrollment in 102.
2. 101-102 = a year's sequence in which 101 is prerequisite for enrollment in 102.
3. (3-3) Yr. = a year's sequence carrying 3 semester hours each semester.
4. (Arr) = the number of semester hours is arranged by the instructor.

Certain number endings are reserved for particular types of courses:

1. "94" courses are Special Topics Courses.
2. "95" courses are Seminars.
3. "96" courses are Internship Courses.
4. "97" and "98" courses are Experimental Courses offered only for one year on that basis ("97" is usually offered in the Fall and "98" in the Spring).
5. "99" courses are Research and Directed Studies Courses.

Course listing codes:

1. (S) Every semester
2. (Y) Yearly
3. (AY) Alternate years
4. (IO) Infrequently offered

ACCOUNTING (ACC)

College of Business and Economics

ACC 250 Financial Accounting (3) (S) Accounting theory and methods used to record and report financial information; methods for valuing the assets, liabilities, and ownership of an organization.

ACC 251 Managerial Accounting (3) (S) Methods for evaluating financial performance including cost accounting, budgeting, breakeven analysis, ratio analysis, and sources and uses of funds. Pre: ACC 250.

ACC 350 Intermediate Accounting I (3) (Y) The accounting process and the application of generally accepted accounting principles to assets and liabilities. Emphasis upon accounting theory. Pre: Admission to Professional Business Program, ACC 250 and junior standing.

ACC 351 Intermediate Accounting II (3) (Y) The application of generally accepted accounting principles to accounting for owner's equity, long-term investment and debt, funds flow, consolidations, and financial statement analysis. Pre: Admission to Professional Business Program, ACC 350 and junior standing.

ACC 352 Individual Income Tax (3) (Y) Principles and practices involved in the determination of federal income taxation and tax planning as it applies to individuals including the concept of gross income, exclusions, deductions, credits, property transactions and sole proprietorships. Pre: Admission to Professional Business Program, ACC 250 and junior standing.

ACC 353 Cost Accounting (3) (AY) Cost accounting system output relevant to managerial decision making, planning and control. Topics include job order and process costing, direct and standard cost systems, with emphasis on application and analysis of cost. Pre: Admission to Professional Business Program, ACC 251 and junior standing.

ACC 354 Business Software (3) (AY) Practical applications of general ledger /bookkeeping for small businesses. Firms of various industries will be used as examples. Focus will be on internal controls, accounting tasks, and comparative product analysis. Comparisons will be made from the standpoint of controls, suitability for task, ease of use,

and functionality. Pre: Admission to Professional Business Program, ACC 250, junior standing, co-requisite registration with ACC 350.

ACC 355 Taxation of Business Entities (3) (Y) Principles and practices involved in the determination of federal taxation of business entities including corporations, partnerships, and LLC's. Calculation of business income, business credits, deductions, loss carryforwards and tax planning for business owners will be covered. Pre: Admission to Professional Business Program, ACC 250, ACC 352, and junior standing.

ACC 358 Governmental Accounting (3) (IO) Accounting principles as applied to nonprofit organizations, including government. Emphasis on budgetary control and fund accounting. Pre: Admission to Professional Business Program ACC 251.

ACC 399 Directed Studies (1-3) Statement of planned reading or research required. Pre: Admission to Professional Business Program, junior standing and consent of instructor.

ACC 450 Advanced Accounting (3) (AY) The application of generally accepted accounting principles to specialized accounting entities: partnerships, branches, affiliated companies, estates and trusts; and to special topics. Pre: Admission to Professional Business Program, ACC 351.

ACC 454 Auditing (3) (AY) Auditing concepts including standards, objectives, and ethics for external auditors. Emphasis on reporting standards, internal control, evidence, statistical sampling, and EDP audits. Pre: Admission to Professional Business Program, ACC 350.

ACC 455 IT Audit (3) (AY) Audits of accounting information systems, including enterprise systems. Generally accepted IT audit standards, framework, tools, and methods. Includes the study and use of computer-assisted audit tools and techniques (CAATTS). Pre: Admission to Professional Business Program, ACC 454.

ACC 494 Special Topics in Accounting (1-3) Advanced topics chosen by the instructor. The course content will vary. It may be repeated for credit, provided that a different topic is studied. Pre: Admission to Professional Business Program varies with topic.

ACC 499 Directed Studies (1-3) Statement of planned reading or research required. Pre: Admission to Professional Business Program, senior standing and consent of instructor.

ADMINISTRATION OF JUSTICE (AJ)

College of Arts and Sciences

AJ 101 Introduction to Administration of Justice (3) Offered in conjunction with Hawai'i Community College. This course focuses on history, philosophy, and language of the criminal justice system. The role of law enforcement, prosecutor, public defender, courts, and corrections is examined. Social aspects of change and how it affects the criminal justice system also explored. Pre: ENG 100/100T or ESL 100/100T or concurrent enrollment in ENG 100/100T or ESL 100/100T.

AJ 103 Criminal Investigations I (3) Offered in conjunction with Hawai'i Community College. This is an introductory course in criminal investigations. The nature of investigations, fingerprint classification, the role of the laboratory, and specific offense investigation will be explored. The class also will discuss interview and interrogation and search and seizure techniques. Pre: ENG 100/100T or ESL 100/100T or concurrent enrollment in ENG 100/100T or ESL 100/100T.

AJ 104 CSI: Violent Crime Forensics (3) Offered in conjunction with Hawai'i Community College. Advanced coursework in forensic science (Legal Scientific Investigation), with its contributions to both Crime Scene Investigations and Laboratory Analysis. Scientific field and laboratory investigative techniques in violent crimes and other major felonies will be explored. Pre: AJ 103.

AJ 150 The Correctional Process (3) Offered in conjunction with Hawai'i Community College. This course examines the history of punishment and corrections. The class discusses laws, records, inmate classification, treatment programs, disciplinary procedures, and supervisory techniques.

AJ 170 Introduction to Private Security (3) Offered in conjunction with Hawai'i Community College. This course surveys the concepts and issues in the administration of security. Defines public versus private security roles for retail business, industry, and governmental agencies. Provides an overview of the functions of various security activities. Pre: ENG 100/100T or ESL 100/100T or concurrent enrollment in ENG 100/100T or ESL 100/100T.

AJ 180 Introduction to Homeland Security (3) Offered in conjunction with Hawai'i Community College. An examination of the history of terrorism, focusing on the terrorists, who they are, and how they operate. Responses to domestic and international terrorism will be discussed along with analyzing future trends. Pre: AJ 101.

AJ 208 Criminology (3) Offered in conjunction with Hawai'i Community College. This course explores crime and the body of knowledge regarding it as a social phenomenon. An emphasis is placed on the analysis of crime, crime causation, crime variables, impact on society, and societal reactions to crime. Pre: ENG 100/100T or ESL 100/100T or concurrent enrollment in ENG 100/100T or ESL 100/100T.

AJ 210 Juvenile Justice (3) Offered in conjunction with Hawai'i Community College. This course focuses on principles and procedures of arrest, detention, petition, summons, records, and adjudication of the juvenile offender. It introduces the organization and function of the police juvenile unit, community diversion practices and organization of the Family Court. Pre: ENG 100/100T or ESL 100/100T or concurrent enrollment in ENG 100/100T or ESL 100/100T.

AJ 220 Constitutional Law (3) Offered in conjunction with Hawai'i Community College. The U.S. Constitution is examined as a basis of arrest, search, seizure, interrogation, use of force, and civil rights. U.S. Supreme Court cases and Hawai'i cases are examined to illustrate the court's interpretive process. Pre: AJ 101.

AJ 221 Criminal Law (3) Offered in conjunction with Hawai'i Community College. Studies history and philosophy of criminal law. Examines United States Constitution, especially the Bill of Rights. Considers nature of law, legal institutions, criminal court procedures, and offenses against persons and property. Includes case briefs. Pre: AJ 101.

AJ 233 Police Organization and Management (3) Offered in conjunction

with Hawai'i Community College. This course studies the principles of organization and administration of policing. Overviews of operations and activities of various divisions, bureaus, training and selection procedures, planning, and research are discussed. Pre: ENG 100/100T or ESL 100/100T or concurrent enrollment in ENG 100/100T or ESL 100/100T.

AJ 234 Police and Community Relations (3) Offered in conjunction with Hawai'i Community College. This course acquaints the student with the role of police in government and the critical importance of effective community relations. The dynamics of race relations and other current social problems that directly relate to the law enforcement community are explored. Pre: ENG 100/100T or ESL 100/100T or concurrent enrollment in ENG 100/100T or ESL 100/100T.

AJ 250 Practice & Procedures in Correction (3) Offered in conjunction with Hawai'i Community College. This course will provide students with the basic training skills necessary to enhance their opportunities to secure a job in the high demand field of corrections. The course will focus on such areas as the history and philosophy of corrections, the role of the correctional officer, legal aspects of corrections, communication and writing skills, as well as basic security procedures. AJ 101 and AJ 150.

AJ 256 Domestic Violence and Child Abuse (3) Offered in conjunction with Hawai'i Community College. This course focuses on domestic violence and child abuse. The cycle of violence, causes, effects and symptoms of child abuse will be explored. Legal, public policy, criminal justice, health and social services' responses and interventions to family, child and intimate partner abuse will be examined. Pre: ENG 100/100T or ESL 100/100T or concurrent enrollment in ENG 100/100T or ESL 100/100T.

AJ 280 Current Issues in the Administration of Justice (3) Offered in conjunction with Hawai'i Community College. Examination of recent textual materials, government reports, and problems within the criminal justice system and how it affects change within American society and the world. Includes preparation of a formal research essay. With the cooperation of public and nonprofit agencies in the community, advanced students are placed in responsible positions where they earn credits for work performed. For AJ majors only. Pre: AJ 101 and ENG 100/100T or ESL 100/100T

AJ 285 Narcotics and Organized Crime (3) Offered in conjunction with Hawai'i Community College. The identification of narcotics and dangerous drugs, their manufacture and distribution, effects on society, applicable Federal and state laws. Vice and organized crime investigations, applicable laws, effects on individuals and society. Pre: ENG 100/100T or ESL 100/100T or concurrent enrollment in ENG 100/100T or ESL 100/100T.

AJ 290B AJ Practicum I (3-6) Offered in conjunction with Hawai'i Community College. With the cooperation of public and non-profit agencies in the community, advanced students are placed in responsible positions where they earn credits for work performed. For AJ majors only. (variable hours). Pre: AJ 101 and AJ 210 or AJ 256.

AJ 290C AJ Practicum II (3-6) Offered in conjunction with Hawai'i Community College. With the cooperation of public and non-profit agencies in the community, advanced students are placed in responsible positions where they earn credits for work performed. For AJ majors only. (variable hours). Pre: AJ 290B.

AJ 290D AJ Practicum III (3-6) Offered in conjunction with Hawai'i Community College. With the cooperation of public and nonprofit agencies in the community, advanced students are placed in responsible positions where they earn credits for work performed. For AJ majors only. Pre: AJ 290C.

AGRIBUSINESS (AGBU)

College of Agriculture, Forestry and Natural Resource Management

AGBU 110 Introduction to Microcomputing for Agriculture (2 lec., 1 lab) (3) (S) Acquaints students with the microcomputer in agricultural applications by using and customizing commercial software, to understand the operation of the microprocessor and its peripherals, and to provide hands-on experience in utilizing some of the most common

word processing, spreadsheet, presentations and database software and access to the Internet.

AGBU 120 Agricultural Business Field Study (1-3) (IO) Agribusiness and agro-economic functions performed by specialized agricultural agencies with emphasis on physical operating patterns; field trips to production, marketing and finance firms; workshops with agribusiness managers.

AGBU 291 Agribusiness Internship/Work Experience (3) (S) Internship with agribusiness firms in the areas of management, sales, food distribution. National Agri-Marketing Association activities may be used with advisor's approval. Permission of instructor is required.

AGBU 320 Agribusiness Management (3 lec.) (3) (Y) Organization forms and management functions of agribusiness firms, management science principles, inventory control, operation research techniques, decision model, and human resources development as they are related to agribusiness firms.

AGBU 321 Agricultural Cooperatives Management (3 lec.) (3) (IO) The nature and place of agricultural cooperatives in the nation with special emphasis on Hawai'i.

AGBU 340 Agri-Marketing Research (3 lec.) (3) (IO) Primary marketing research including problem definition, hypothesis formulation, research design, data collection, and results analysis. Mechanics of writing technical reports and oral presentations. Pre: AGECE 201 or ECON 130.

AGRICULTURE (AG)

College of Agriculture, Forestry and Natural Resource Management

AG 100 Agriculture Orientation (3) (Y) Introduction to CAFNRM and agriculture in Hawai'i. Includes field trips and guest speakers to learn different aspects of agriculture.

AG 194 Focus on Agriculture (1) (S) Topics related to diversified agriculture in Hawai'i chosen by the instructor. Course content will vary. May be repeated. Course is televised live, statewide, via the Interactive Television System and local cable community service channel.

AG 195 Special Topics in Agriculture (1-4) (S) Lower division topics chosen by instructor. Course content will vary. May be repeated, provided that a different topic is studied.

AG 199 Directed Reading (1-3) (S) Permission of instructor and statement of planned reading required.

AG 230 Sustainable Agriculture (2 lec., 1 lab) (3) (Y) Evaluation of conventional and alternative farming methods in the U.S. Polynesia, Southeast Asia, Africa and Latin America from a long-term perspective. Analysis of the effects of those practices on environmental quality, agrosystems, and food security. Consideration of conflicting values and resolution.

AG 290 Student-Managed Farm Enterprise Project (1-3) (IO) Selection, planning, and completion of a production/management/marketing project under faculty supervision. Project participation is voluntary and subject to approval. Students must maintain complete production and financial records. (Repeatable)

AG 299 Directed Work Experience Program (3) (S) Agricultural practice in individual and team projects on independent farms or agricultural employment under supervision and direction during summer vacation or on a part-time basis during regular school period. Permission of instructor required. Only for CAFNRM students and offered only on a CR/NC basis. Credits earned not included in maximum allowed.

AG 304 Applied Microbiology (2 lec., 1 lab) (3) (S) An overview of the production aspects of microbiology, including fermentation biology, mushroom cultivation, and biotechnology.

AG 312 Agricultural Geography and World Food Problems (3) (IO) Different types of agriculture, their location, and the cultural and environmental constraints operating to produce the resultant patterns. World food and hunger. Pre: one introductory Geography course. (Same as GEOG 312)

AG 375 Introduction to Genetic Analysis (3) (Y) An introduction to

the principles and methods of genetic studies. The principles are first covered, especially with regard to crop improvement. This is followed by an overview of the structure and function of DNA and RNA, and an introduction to the tools and applications of molecular biology.

AG 395 Special Topics in Agriculture (1-4) (S) Advanced topics chosen by instructor. Course content will vary. May be repeated, provided that a different topic is studied. Pre: junior standing or consent of instructor.

AG 399 Directed Research (1-3) (S) Permission of instructor and statement of planned research required.

AG 405 Plant Biotechnology (3) (Y) This course will provide basic information about plant biotechnology, with examples of its uses. Topics will include overviews of plant gene and genome analysis, transgenic technology, and bioinformatics, with emphasis on crop improvement. Pre: at least one biology course. Offered Fall semester.

AG 497 Senior Seminar (1) (Y) Guided research into current problems. Topics may vary according to interest of students and instructor. CR/NC only.

AGRICULTURAL ECONOMICS (AGEC)

College of Agriculture, Forestry and Natural Resource Management

AGEC 201 Agricultural Economics (3 lec.) (3) (S) Introduction to agriculture and resource economics and agri-business with application to Hawaiian agriculture (Micro-economics).

AGEC 221 Agricultural Accounting and Records Analysis (2 lec., 1 lab) (3) (Y) Introduces accounting theory and methods used to record and report financial information for both the business and farm firm. Other topics include business organization, inventories, receivables and payables, depreciation, and computer applications.

AGEC 322 Marketing Agricultural Products (3 lec.) (3) (Y) Acquaints the student with the economic organization and operation of the food and fiber sector of the U.S. and Hawaiian economy. In two general parts, one provides a treatment of agricultural price analysis; the second examines the marketing system for agricultural inputs, farm products, and processing and distribution activities with emphasis on cooperative marketing. Field trips to cooperative and other marketing firms. Future trading. Pre: introductory course in economics or agricultural economics.

AGEC 330 Farm Management (2 lec., 1 lab) (3) (Y) Acquaints the student with both theoretical and applied aspects of farm management. Topics include farm planning, managerial control, and acquiring and managing resources. Emphasis on mainland but applied emphasis on Hawaiian farming systems. Stress on cost of production and cash flow budgets, capital investment, and linear programming. Computer applications. Pre: introductory course in economics or agricultural economics, ACC 250.

AGEC 380 Environmental Policy and Management of Hawaiian Natural Resources (3 lec.) (Y) Provides the student with an understanding of economic growth, resource scarcity and policy, environmental degradation, economic policy, property right and income distribution, institutional framework, benefit cost analysis, and application of natural resource management in Hawai'i.

AGRICULTURAL ENGINEERING (AGEN)

College of Agriculture, Forestry and Natural Resource Management

AGEN 231 Introduction to Agricultural Mechanization (2 lec., 1 lab) (3) (S) Identification, proper use and maintenance of tools used in the shop and farm, plan reading, identification, selection and estimation of materials for agricultural projects. Principles of arc and oxy-acetylene welding, basic engineering concepts involved with layout and leveling, areas and heat flow, simple electrical wiring.

AGEN 232 Farm Tractor Operation (1 lab) (1) (IO) Operation of agricultural tractors and allied machinery on the University Farm. Safety, maintenance, and field adjustments of tractors and implements. Limited enrollment. A valid driver's license and permission of instructor are required.

AGEN 301 Farm Power (2 lec., 1 lab) (3) (AY) Management and maintenance of power units used in agriculture. Principles of internal combustion engines. Shop and field practice in adjusting and operating internal combustion engines and associated field equipment. Alternate power options on farm. Pre: College Algebra. A valid driver's license is highly desirable.

AGEN 302 Farm Structures and Utilities (2 lec., 1 lab) (3) (AY) Farmstead planning, materials, design, construction and maintenance, farm utilities, water-sewage systems and labor-saving conveniences. Pre: College Algebra and AGEN 231.

AGEN 305 Agriculture Mechanics Skills (1 lab) (1) (IO) Design, construction, & evaluation of an agricultural project to be constructed in laboratory under faculty supervision. Pre: AGEN 231 or consent of instructor.

AGEN 400 Aquaculture Engineering (3 lec., 1 lab) (4) (Y) Principles of site selection, design and construction of aquaculture systems. Pre: AQUA 262 or consent of instructor. (Same as MARE 400)

AGEN 435 Irrigation Principles and Practices (2 lec., 1 lab) (3) (Y) Comprehensive study of basic irrigation principles and practices. Basic hydraulics, water supply, conveyance, and measurement. Plant-soil-water relationship, evapotranspiration, and scheduling. Planning and design of irrigation systems. Pumps: types, selection and operation. Pre: College Algebra or consent of instructor.

AGRONOMY (AGRN)

College of Agriculture, Forestry and Natural Resource Management

AGRN 310 Agronomic Crop Production in the Tropics (2 lec., 1 lab) (3) (IO) Current agricultural practices in production of food, feed, and fiber crops in the tropics. Pre: HORT 262 or consent of instructor.

AGRN 410 Soil-Plant-Herbivore Interrelations (2 lec., 1 lab) (3) (Y) The principles of plant competition and succession during the establishment and maintenance of herbaceous species and communities are related to soil, biotic, and microclimate factors and their interactions. Ecological and nutritional principles embodying plant and animal factors in the utilization of herbaceous plants by livestock are established. Research methodology in grassland systems also is presented. Pre: ANSC 141, BIOL 175 or HORT 262, or consent of instructor.

ANIMAL SCIENCE (ANSC)

College of Agriculture, Forestry and Natural Resource Management

ANSC 141 Introduction to Animal Science (2 lec., 1 lab) (3) (S) Introduction to livestock, species and industry, breeding, behavior, growth, handling, environment, market classes, nutrition, reproduction, safety, terms, and issues related to livestock production.

ANSC 165 Animal Health (3) (Y) The fundamentals of animal health will be taught from the veterinary medical perspective. Topics addressed will include causes of disease, basic immunology, disease prevention, principles of drug therapy, and examples of animal disease processes. Offered Fall Semester only.

ANSC 175 Animal Behavior (3) (Y) Introduction to the basic principles and processes regarding domestic animal behavior including communication, social structure, sexual behavior, learning, and common behavioral disorders. Offered in Spring Semester only.

ANSC 185 Introduction to Companion Animals (3) (Y) Introduction of common breeds of the dog and the cat, proper physical examination, proper care, and nutrition. Offered Spring Semester only.

ANSC 244 Fundamentals of Animal Nutrition (3 lec.) (3) (Y) Comparative animal digestive systems and metabolism. Essential nutrients, their functions, mechanisms of action and interrelationships. Pre: ANSC 141, CHEM 124 and 125, or consent of instructor. (Equivalent to BIOL 254)

ANSC 321 Feeds and Feeding (2 lec., 1 lab) (3) (Y) Identification of common feedstuffs and their feeding value for animal production. Important concepts on feed processing, nutrient availability, diet formulation, and feeding management. The economics of feeding and purchasing feeds based on nutrient value. Pre: ANSC 141 and ANSC 244.

ANSC 342 Beef Cattle Production (2 lec., 1 lab) (3) (Y) Principles of efficient beef production including comparative breed evaluation, performance testing and selection, breeding, feeding management, health care, and marketing. Pre: ANSC 141 or consent of instructor.

ANSC 350 Anatomy and Physiology of Farm Animals (2 lec., 1 lab) (3) (Y) Structure and function of the animal body, including those of the horse, cow, sheep, and pig. A general study of anatomy, but emphasis placed on understanding the physiology of animal systems. Pre: ANSC 141, CHEM 124 or consent of instructor. (Equivalent to BIOL 323)

ANSC 351 Swine Production (2 lec., 1 lab) (3) (Y) Principles of efficient pork production including: breeds, crossbreeding, feeding, herd health, housing, management, selection and waste management. Pre: ANSC 141 or consent of instructor.

ANSC 353 Horse Production (2 lec., 1 lab) (3) (Y) Origin of species, breeds, feeding, lameness evaluation, reproductive considerations, and health issues of light horses. Limited enrollment. Pre: ANSC 141 or consent of instructor.

ANSC 354 Poultry Production (2 lec., 1 lab) (3) (IO) Principles of efficient poultry production including breeding, feeding, housing, and management of different types of poultry. Problems and practices associated with tropical environment emphasized. Pre: ANSC 141 or consent of instructor.

ANSC 355 Goat and Sheep Production (2 lec., 1 lab) (3) (Y) Principles of efficient goat and sheep production, including: breeds, crossbreeding, feeding, herd health, management, reproduction, and selection. Pre: ANSC 141 or consent of instructor.

ANSC 445 Animal Breeding and Genetics (2 lec, 1 lab) (3) (Y) Principles of Mendelian, population and quantitative genetics. Applications to improvement of livestock through selection methods and mating systems. Pre: ANSC 141. MATH 121 or equivalent course is recommended.

ANSC 450 Reproduction of Farm Animals (2 lec, 1 lab) (3) (Y) Livestock reproductive anatomy and physiology. Pre: ANSC 141. ANSC 350 recommended. (Equivalent to BIOL 450)

ANSC 453 Animal Diseases and Parasites I (3) (Y) Principles and practices used for the prevention, diagnosis, and treatment of diseases and parasites in livestock. ANSC 453 and 454 do not have to be taken in sequential order. Pre: ANSC 141 or consent of instructor.

ANSC 454 Animal Diseases and Parasites II (3) (Y) Principles and practices used for the prevention, diagnosis, and treatment of diseases and parasites in livestock. ANSC 453 and 454 do not have to be taken in sequential order. Pre: ANSC 141 or consent of instructor.

ANSC 490 Animal Science Internship (3) (Y) CR/NC Practical animal experience (employed or voluntary) at farms, ranches, veterinary clinics, zoos and other animal operations. Permission of the instructor is required before enrolling in ANSC 490. Pre: ANSC 141 and two of the following: ANSC 342, 351, 353, 354 and 355.

ANTHROPOLOGY (ANTH)

College of Arts and Sciences

ANTH 100 Cultural Anthropology (3) (S) Humans as cultural and social beings. The major concepts and conclusions of cultural anthropology. Biological, social, and linguistic foundations of culture. Basic research methodology.

ANTH 110 Archaeology (3) (S) Prehistoric archaeology; methods and techniques of excavation and analysis; brief survey of man's cultural growth in prehistoric times.

ANTH 115 Human Evolution (3) (S) The evolution of humans and their position among the primates. Human adaptation to the environment both in the past and present. Human biology with an emphasis on variation and its sources.

ANTH 121 Introduction to Language (3) (S) Linguistically oriented approaches to human behavior, including ethnolinguistics, sociolinguistics, and psycholinguistics. The way language functions in culture, society, and the cognitive processes. (Same as LING 121)

- ANTH 200 Cultures of the World: Regional Survey (3) (AY)** The traditional cultures of various geographic areas of the world. Specific regions to be announced each semester: (b) Oceania, (c) East Asia, (d) South East Asia, (e) South Asia, (f) North America, (g) Africa, (h) South America, (i) Other. (May be repeated for credit if subletters are different)
- ANTH 220 Archaeoastronomy (3) (Y)** The use of astronomical observation and mathematics for navigation, agriculture, time keeping and calendar-making and their role in ancient cosmologies, mythology and religion. Astronomical theories of antiquity. Particular attention to astronomical alignments in Egyptian architecture, Mayan codices, classical Greek astronomical theory, historical astronomy and the navigational methods and calendars of Pacific Islanders. "Naked eye" astronomy and basic practical astronomical methods used by ancient astronomers, particularly Polynesians and Hawaiians. (Same as ASTR 220)
- ANTH 299 Directed Studies (1-3) (S)** Statement of planned reading or research required. Pre: sophomore standing and consent of instructor.
- ANTH 315 Ecological Anthropology (3) (Y)** Relationship of humans to their natural environment, particularly emphasizing the role of culture as a dynamic component in ecological systems. Pre: ANTH 100 or 115, or consent of instructor.
- ANTH 320 Cross-Cultural Study of Women (3) (AY)** Comparative analysis of women's roles and women's lives in different societies. Topics include women's status, life stages, gender roles, images of women and power. (Same as WS 320).
- ANTH 321 Morphology and Syntax (3) (IO)** Introduction to grammatical analysis and theory; practical experience in solving problems in morphology and syntax, using data drawn from a wide variety of languages. Pre: LING 102 or consent of instructor. (Same as LING 321, ENG 321)
- ANTH 323 Cultural and Social Change (3) (AY)** Various approaches to cultural and social change in nonliterate and modern societies; evolution, diffusion, acculturation, adaptation, revolution.
- ANTH 324 Culture, Sex and Gender (3) (AY)** A cross-cultural examination of the development of gender systems and gender roles. Consideration of sex roles and activities as part of the larger gender system. Pre: ANTH 100 or consent of instructor. (Same as WS 324).
- ANTH 331 Language in Culture and Society (3) (Y)** An examination of the articulation of language in social and cultural context, including topics relevant to sociolinguistics and ethnolinguistics. Pre: ANTH/LING 121 or LING 102 or consent of instructor. (Same as LING 331)
- ANTH 347 Pidgins and Creoles (3) (AY)** A study of the world's pidgins and creoles; the origin and nature of pidgins and creoles; the relationship of Hawaiian Creole English to other creoles in the world; the link between the development of a Creole and language acquisition. (Same as ENG 347, LING 347; recommended LING 102 or 121)
- ANTH 354 Filipino Culture (3) (AY)** Introduction to Peoples and Cultures of the Philippines. Topics include cultural origins, linguistics and cultural diversity, values, social structure, and overseas Filipino adaptations.
- ANTH 356 Japan (3) (Y)** Culture origins and development with emphasis on contemporary Japanese culture. (Same as JPST 356)
- ANTH 357 Change in the Pacific (3) (Y)** Peoples of the Pacific Islands with emphasis on contemporary cultures and social and political problems. Pre: consent of instructor.
- ANTH 358 Japanese Immigrants (3) (Y)** Examination of social and cultural adaptations of Japanese immigrant populations, with foci on Hawai'i and Brazil. Topics include the role of the Japanese government and emigration companies, the factors of generation, kinship, ethnicity, and contemporary Japanese migrants. (Same as JPST 358)
- ANTH 372 Culture Through Film (3) (AY)** Critical examination of ethnographic films (documentaries that describe a culture). Film construction and film-maker's intentions. Development of approaches to ethnographic film-making. Cultural representation in film. Relationship of film to written ethnography. Pre: ANTH 100.
- ANTH 384 Primatology (3) (AY)** Evolutionary approach to the nonhuman primates. Biological and behavioral adaptations of primates to their ecological setting. Implications of primate adaptations for understanding human biology and behavior. Pre: ANTH 115, or BIOL 176. (Same as BIOL 384)
- ANTH 385 Hawaiian and Pacific Prehistory (3)(Y)** Archaeological overview of the cultures of the Pacific before European contact with an emphasis on Polynesia and Hawai'i.
- ANTH 386 Hawaiian Culture Before 1819 (3) (Y)** Hawaiian culture before the 1819 overthrow of the native Hawaiian religion: fishing and farming, political-economic organization and religion. Emphasis on early Hawaiian writers—Malo, Kamakau and 'I'i. Pre: ANTH 100 or HWST 111 or consent of the instructor.
- ANTH 387 Modern Hawaiian Culture (1819 to present) (3) (Y)** Change and continuity in Hawaiian culture from 1819 to the present, in the context of interaction with non-Hawaiians. Major cultural transformations of the nineteenth century. Hawaiian culture in the early and later twentieth century. Pre: ANTH 100 or HWST 111.
- ANTH 388 Historical Archaeology (3) (Y)** Historical archaeology as an integral aspect of anthropological inquiry into culture-contact and culture change. Topics include research designs, field methods, laboratory methods, and generating "anthropological histories". North American historical archaeology is reviewed with an emphasis on the potential applications of historical archaeology in Oceania. Pre: ANTH 110.
- ANTH 389 Cultural Resource Management (3) (AY)** Covering issues pertaining to the identification, evaluation, and conservation of cultural resources, with an emphasis on archaeological sites. Central topics include the National Historic Preservation Act, the Native American Graves Protection and Repatriation Act, Hawai'i State legislation regarding cultural resources, and the implementation of these laws in Hawai'i by government and private organizations.
- ANTH 399 Directed Studies (1-3) (S)** Statement of planned reading or research required. Pre: junior standing and consent of instructor.
- ANTH 415 Medical Anthropology (3) (Y)** Approaches to health, disease and medicine in both Western and non-Western cultures including ecological, evolutionary and anthropological perspectives of disease. Pre: 9 credits in either anthropology or biology.
- ANTH 435 Senior Seminar in Pacific Studies (3) (AY)** A reading and research seminar under the supervision of the Pacific Islands Studies faculty aimed at demonstrating competence in research and writing on issues related to Pacific Islands environments, culture, society, and economy. Pre: consent of instructor for students near completion of Pacific Islands Studies Certificate coursework. (Same as GEOG 435)
- ANTH 445 Ethnographic Field Techniques (3) (AY)** Techniques of anthropological field research; ethnographic literature and work with informants. Pre: ANTH 100 or consent of instructor.
- ANTH 450 Physical Anthropology Laboratory (4) (AY)** Human biology of living and skeletal populations. Methods and techniques of quantitative and qualitative analysis of human anatomical, physiological and biochemical variation under field conditions. Pre: ANTH 115 and consent of instructor.
- ANTH 470 Museology (3) (IO)** Museum training, including museum activities, exhibits, administration, custodial problems and interpretation. At least one field trip to Lyman House Museum. Pre: ANTH 100 or 110, or consent of instructor.
- ANTH 475 History of Anthropological Theory (3) (Y)** Theory and method in anthropology; emphasis on cultural/social anthropology. Pre: ANTH 100 and junior or senior standing, or consent of instructor.
- ANTH 481 Archaeometry (3) (AY)** Covering a broad range of analytical techniques in archaeological research, emphasizing the relationships of archaeology to the natural sciences. Mini-sections of the course involve hands-on laboratory experience, covering geoarchaeology, zooarchaeology, archaeobotany, identification of raw materials and resources, and dating techniques.
- ANTH 482 Archaeological Research Methods (4-6) (AY)** Archaeological methods including research design, field methods such as survey, map-

ping and excavation, and laboratory methods. Normally taught as a summer session course. Credit varies depending on length of field project (4-6 weeks, 8/hrs./day). Pre: ANTH 110 or permission of instructor. May be repeated for credit up to maximum of 12 credit hours.

ANTH 484 Stone Tool Analysis (3) (AY) Analytical techniques related to stone artifacts (lithics) from archaeological sites, with an emphasis on lithic technology, or understanding the processes by which stone tools were manufactured, used, and eventually discarded. Identification of lithic "debitage," geochemical characterization, use-wear, and applications to Hawaiian flaked, pecked, and ground tools.

ANTH 485 Applied Anthropology (3) (AY) Anthropological methods, concepts, and theories as they apply to the solution of contemporary human problems. Exploration of the use of anthropology in various occupational areas. Pre: ANTH 100 and junior or senior standing, or consent of the instructor.

ANTH 490 Internship in Archaeology (3-6) (S) Placement and experience in public, private, and/or government agencies involved in archaeological research plus completion of related research project. Pre: ANTH 110 plus instructor and departmental approval. May be repeated for credit if topics are different up to a maximum of 12 credits.

ANTH 495 Proseminar (3) (AY) Selected problems in current research: (b) archaeology, (c) linguistics, (d) social and cultural anthropology, (e) applied anthropology, (f) psychological anthropology, (g) physical anthropology, or (h) other areas of interest. Limited to anthropology majors or students with at least 9 semester hours of anthropology courses above 100-level. (May be repeated for credit if topics are different)

ANTH 499 Directed Studies (1-3) Statement of planned reading or research required. Pre: senior standing and consent of instructor.

AQUACULTURE (AQUA)

College of Agriculture, Forestry and Natural Resource Management

AQUA 262 Introduction to Aquaculture (3 lec.) (3) (S) Discussion of the biological, physicochemical and economic aspects of aquaculture, including a survey of the culture techniques of cultured species of finfish, shellfish, lower invertebrates and algae. Pre: MARE 171 or college level biology class. (Same as MARE 262)

AQUA 425 Water Quality and Aquatic Productivity (3) (Y) Study of water quality and aquatic productivity as it relates to aquaculture and fisheries. Pre: CHEM 124 or consent of instructor. (Same as BIOL 425 or MARE 420)

AQUA 425L Water Quality and Aquatic Productivity Lab (1) (Y) Hands-on education in the monitoring and management of water quality and algal populations in ponds and other aquatic systems. Pre: Previous or concurrent enrollment in AQUA 425.

AQUA 450 Aquaculture Production Techniques (3) (Y) Theory and practice of aquaculture techniques; identification, reproduction, hatchery and nursery operations, grow-out, health management, harvest and marketing. Pre: AQUA 262 or aquatic ecology or consent of instructor. (Same as MARE 450.)

AQUA 450L Aquaculture Production Techniques Laboratory (1) (Y) Hands on experience in hatchery, nursery and grow-out of algae, mollusks, crustaceans and fish. Includes field trips. Pre: AQUA 450 or concurrent enrollment in AQUA 450 or consent of instructor. (Same as MARE 450L.)

AQUA 466 Fisheries Science (3) (Y) General characteristics of fisheries, harvesting methods, principles and techniques to derive data and analyze fished population. Pre: background in fish biology and aquatic ecology or consent of instructor.

ART (ART)

College of Arts and Sciences

ART 101 Introduction to the Visual Arts (3) (S) Slide/lecture course and introduction to the visual arts in their various forms and expressions.

ART 109 Introduction to Drawing and Painting for Non-Majors (3)

(Y) Studio experiences for non-majors. Emphasis on formal concepts in drawing and painting. The course incorporates various drawing and painting media into exercises, projects, and lectures to develop personal expression.

ART 121 FP Studio: Beginning Drawing (3) (S) Foundation Program Studio. Basic drawing concepts with studio investigations into line, shape, form, light and value, and space. Explorations of principles of visual organization and basic drawing media of pencil, charcoal, crayon, pen and ink, and brush and ink. Discussion of perceptual relationships of light and space.

ART 122 FP Studio: Beginning Painting (3) (Y) Foundation Program Studio. Introduction to painting; exploration of color theory and its applications; and investigation of perceptual relationships of light, color, and space. Studio exploration of the principles of visual organization through applications of color concepts and fundamental materials and techniques of painting. Pre: ART 121.

ART 123 FP Studio: 2-Dimensional Design (3) (Y) Foundation Program Studio. Investigations of two-dimensional design concepts and the elements and principles of visual organization. Inquiry into perceptual and visual relationships of design principles. Discussion of relationships of visual elements and time and space.

ART 124 FP Studio: 3-Dimensional Design (3) (Y) Foundation Program Studio. Investigation of the principles and elements of design in three-dimensional concepts. Tactile exploration of forms, environments, and expressions. Explorations into perceptual relationships of time, light, and space in three-dimensional visualizations.

ART 199 Directed Studies (1-3) Permission of instructor and statement of planned reading or research required.

ART 215 Printmaking: Intaglio (3) (Y) Basic intaglio techniques of etching, engraving, drypoint, and aqua-tint; perceptual and conceptual exercises in composition and pictorial structure. Pre: ART 121, 123.

ART 216 Printmaking: Lithography (3) (AY) Basic lithographic techniques; development of concepts. Pre: ART 215.

ART 221 Intermediate Drawing (3) (Y) Life drawing and study of the human figure; studio drawing concepts and application of drawing materials. Explorations of anatomy, gesture, contour, form, light, and space in relation to figure studies. Pre: ART 121. Repeatable for a total of 9 semester hours.

ART 222 Intermediate Painting (3) (Y) Intermediate painting studio. Development and explorations of painting materials and concepts and the visual relationships of subject matter, content, and composition. Pre: ART 121, 122.

ART 270 Aspects of Western Art (3) (Y) The development of western art and architecture, with emphasis on the impact of Christian traditions on the arts of classical Greece and imperial Rome; modes of artistic expression after the American and French Revolutions.

ART 280 Aspects of Asian Art (3) (Y) The history of form and content in various Asian cultures, with emphasis on the art and architecture of India and southeast Asia, and the expansion of Buddhist arts to China and Japan.

ART 299 Directed Studies (1-3) Permission of instructor and statement of planned reading or research required. Pre: sophomore standing.

ART 300 Intermediate Studio Seminar (3) (IO) Studio explorations in a variety of media including mixed media. Presentations, critiques, and assigned readings for the purpose of comparative study and discussion. Pre: Foundation Program Studios (ART 121, 122, 123, 124) and completion of two semesters of 200-level art studios.

ART 315 Advanced Printmaking: Intaglio (3) (Y) Advanced intaglio techniques involving more complex development of individual projects. Pre: ART 215. Repeatable for a total of 9 semester hours.

ART 316 Advanced Printmaking Seminar (3) (IO) Advanced studio practice in independent projects. Pre: ART 216 or ART 315. Repeatable for a total of 9 semester hours.

ART 321 Advanced Drawing (3) (AY) Studio practice of advanced and individual problems in drawing. Pre: ART 221. Repeatable for a total of

9 semester hours.

ART 322 Advanced Painting (3) (Y) Studio practice of advanced and individual problems in painting. Pre: ART 221, 222. Repeatable for a total of 9 semester hours.

ART 360 Renaissance and Baroque Art (3) (AY) The historical development of European art, beginning with the transition from the late Middle Ages, and concluding with the transition into the NeoClassical period; features the motivating religious, philosophical and aesthetic values. No prerequisites for juniors and seniors; others admitted by special permission.

ART 370 Modern Art (3) (AY) A history of twentieth century European and American art to the present; relationships with earlier traditions. No prerequisites necessary for juniors and seniors; others admitted by special permission.

ART 375 Christianity and the Arts (3) (IO) Relationships of the arts to Christian beliefs and ritual from early Christian era to the present; role of the artist, church, and patron. No pre-requisites for juniors and seniors; others admitted by special permission.

ART 380 Art of China (3) (AY) Chinese art from the Neolithic period to the Qing Dynasty, with emphasis on the Song and later periods. No pre-requisites necessary for juniors and seniors; others admitted by special permission.

ART 381 Art of Japan (3) (AY) The history of art in Japan with emphasis on Buddhist art, the relationships between Chinese and Japanese arts. No prerequisites necessary for juniors and seniors; others admitted by special permission. (Same as JPST 381)

ART 385 Religious Arts of East Asia (3) (AY) Interrelationships of the arts and religion in various Asian cultures, with emphasis on Buddhism, Hinduism, Confucianism, Daoism, and Shinto. No prerequisite necessary for juniors and seniors; others admitted by special permission.

ART 390 Seminar in Contemporary Art (3) (AY) Focuses on the issues raised by contemporary art and traces historical/aesthetic developments from the beginning of the Modern period to the present. Assigned readings and lecture/discussion. Pre: ART 270, 280 or consent of the instructor.

ART 399 Directed Studies (1-3) Statement of planned reading or research required. Pre: junior standing and consent of instructor.

ART 494 Special Topics in Art (1-3) (IO) Advanced topics chosen by the instructor. The course content will vary. It may be repeated for credit, provided that a different topic is studied. Pre: consent of instructor.

ART 499 Directed Studies (1-3) Statement of planned reading or research required. Pre: senior standing and consent of instructor.

ASTRONOMY (ASTR)

College of Arts and Sciences

ASTR 110 General Astronomy (3) (S) A survey of modern astronomy intended for non-science majors; the structure and evolution of the solar system, stars, stellar systems, and the Universe. If students desire to take ASTR 110, 180, and 181, they may receive credit for ASTR 110 only if it is taken prior to taking ASTR 180 and ASTR 181.

ASTR 110L General Astronomy Laboratory (1) (1 3-hr. lab) (S) Demonstration of astronomical principles through laboratory observations and analysis of astronomical data. Not required for ASTR 110. Pre: credit or registration in ASTR 110, ASTR 180, or ASTR 181.

ASTR 130 Introduction to Space Science (3) (Y) An introduction to space science and related subjects. Topics discussed are the contents of the solar system and of near-Earth space, history and physical principles of space flight, remote sensing of the Earth from space, space habitats and manned missions to the planets, the sociological impact of space exploration, and the prospects for life elsewhere in the Universe.

ASTR 150 Life in the Universe (WWW) (3) (AY) The possibility that life might exist elsewhere in the universe has fascinated human beings ever since our ancestors first gazed into the starry sky. In this course, the question of extraterrestrial life is considered from astronomical,

biological, and sociological perspectives. Topics include planets, stars and galaxies, the Big Bang, the origin and evolution of life on Earth, searches for extraterrestrial life, and more. A non-mathematical course for non-science majors who want to explore astronomy.

ASTR 180 Principles of Astronomy I (3) (Y) A survey of modern solar system astronomy with emphasis on the underlying physical principles. Topics discussed include the celestial sphere and aspects of the night sky, the structure and evolution of the Sun's planetary system, comparative planetology, and theories of the formation of planetary systems. Intended for science majors and prospective science teachers. The student should have a good operational familiarity with high school algebra. If students desire to take ASTR 110, 180, and 181, they may receive credit for ASTR 110 only if it is taken prior to taking ASTR 180 and ASTR 181.

ASTR 181 Principles of Astronomy II (3) (Y) A survey of modern stellar, galactic, and extragalactic astronomy, with emphasis on the underlying physical principles. Topics covered include stellar structure, interstellar environments and the formation of stars, stellar evolution and death, the structures of galaxies, and cosmology. Intended for science majors and prospective science teachers. The student should have a good operational familiarity with high school algebra. If students desire to take ASTR 110, 180, and 181, they may receive credit for ASTR 110 only if it is taken prior to taking ASTR 180 and ASTR 181. Pre: ASTR 180.

ASTR 220 Archaeoastronomy (3) (Y) The use of astronomical observation and mathematics for navigation, agriculture, time keeping and calendar-making and their role in ancient cosmologies, mythology and religion. Astronomical theories of antiquity. Particular attention to astronomical alignments in Egyptian architecture, Mayan codices, classical Greek astronomical theory, historical astronomy and the navigational methods and calendars of Pacific Islanders. "Naked eye" astronomy and basic practical astronomical methods used by ancient astronomers, particularly Polynesians and Hawaiians. (Same as ANTH 220)

ASTR 250 Observational Astronomy (3) (Y) An introduction to the tools and techniques of observational astronomy: astronomical time and coordinate systems, photometric systems and magnitudes, principles of telescopes and their operation, introduction to modern astronomical instruments, analysis of astronomical data. Coursework includes observations with small telescopes, and tours of the observatories on Mauna Kea. Pre: ASTR 180, 181; MATH 104G.

ASTR 250L Observational Astronomy Laboratory (1) (1 3-hr. lab) (Y) Modern observational astronomy, with emphasis on "hands-on" use of instruments to acquire data with research-grade telescopes atop Mauna Kea. On-site observing experience with CCD photometry and spectroscopy through direct acquisition and data analysis using modern laboratory data reduction software. Applications to stellar and, where possible, galactic astrophysics. Pre: the equivalent of ASTR 181; lab course to be taken simultaneously with ASTR 250.

ASTR 260 Computational Physics and Astronomy (3) (Y) Computational techniques in physics and astronomy, with an emphasis on the use of computer engineering and scientific software. Topics covered include approximation techniques, numerical modeling of physical systems, solutions of non-linear and inverse problems, Fourier analysis and filtering, and elementary statistical and numerical concepts. Pre: PHYS 170/171, MATH 205/206 (Same as PHYS 260).

ASTR 299 Directed Studies (1-3) (IO) Permission of the instructor and a statement of planned reading or research is required. Pre: sophomore standing.

ASTR 350 Stellar Astrophysics (3) (AY) Stellar astronomy from a modern, physical viewpoint: principles of stellar structure; stellar energy sources and evolution; radiative transfer and the structure of stellar atmospheres; multiple and variable stars. Pre: ASTR 181, PHYS 271, PHYS/ASTR 260.

ASTR 351 Galactic & Extragalactic Astrophysics (3) (AY) The astronomy of galaxies and the large-scale structure of the Universe from a modern, physical point of view: the structure, contents, dynamics, and evolution of the Milky Way and of other galaxies; clusters of galaxies; the formation of galaxies; the extragalactic distance scale and the large-scale struc-

- ture of the Universe; observational cosmology. Pre: ASTR 181, PHYS 271, PHYS/ASTR 260.
- ASTR 352 Comparative Planetology (3) (IO)** Study of the geology and geophysics of Earth-like planets and satellites in the Solar System, with emphasis on understanding terrestrial geology in a border, astronomical context. Study of the atmosphere of Solar System planets and satellites, and also the formation and evolution of the Solar System and extra solar planetary systems. Pre: GEOL 111, ASTR 180 (Same as GEOL 352)
- ASTR 399 Directed Studies (1-3) (IO)** Permission of the instructor and a statement of planned reading or research is required. Pre: Junior standing.
- ASTR 400 Observatory Internship (1-6) (IO)** Cooperative education experience with student employed in an astronomical observatory or research facility on the Island of Hawai'i. One credit is granted for each full-time working month, or equivalent thereof, to a limit of 6 credits (such credits may not be counted as upper-division ASTR electives for the purpose of fulfilling that requirement for the B.S. degree or minor in Astronomy). Pre: consent of department.
- ASTR 432 Senior Laboratory/Thesis Project (3) (Y)** Individual research projects conducted in the college laboratory, library, or observatory; or at an external research facility; under the direct guidance of a member of the physics and astronomy faculty or an affiliated faculty member. Students must propose and complete a research project, and present a final report to the department. May be repeated once for a maximum of 6 credits. Permission of the department is required for registration. (Same as PHYS 432).
- ASTR 450 Instruments and Techniques (3) (AY)** A course in current astronomy observational instruments and techniques, with emphasis on "hands-on" use of instruments to acquire data with research telescopes on Mauna Kea. Topics covered include optical and infrared photometric instruments, CCD and IRCCD cameras, astronomical spectrographs and interferometers, advanced data analysis. Pre: ASTR 250, PHYS 331, PHYS/ASTR 260.
- ASTR 460 Gravitation and Cosmology (3) (IO)** An introduction to Einstein's General Theory of Relativity, with emphasis on astronomical applications: the curvature of space-time and the principle of equivalence; gravitational collapse and black holes; the large-scale structure of the Universe; modern cosmology. Pre: PHYS 270, Math 232.
- ASTR 470 Astrodynamics (3) (IO)** An introduction to the applications of gravitational dynamics: celestial mechanics; the dynamics of stellar systems; orbits and trajectories of spacecraft. Pre: PHYS 271, PHYS/ASTR 260, MATH 300.
- ASTR 494 Special Topics in Astrophysics (3) (IO)** Detailed study of selected topics in astrophysics, to be chosen by the instructor. Course content will vary, and may be repeated for credit, provided a different topic is studied. Pre: permission of instructor.
- ASTR 495A-495B Seminar (1-1) YR. (S)** Seminar presentations of topics in the physical sciences by faculty, enrolled students and invited speakers. The first semester (495A) is taken CR/NC; in the second semester (495B), students are required to present a seminar for a letter grade. Pre: senior standing or consent of instructor. (Same as CHEM 495A-495B, GEOL 495A-495B, MATH 495A-495B, and PHYS 495A-495B).
- ASTR 499 Directed Studies (1-3) (IO)** Permission of the instructor and a statement of planned reading or research is required. Pre: Senior standing.
- biological evolution of the universe. Pre: high school Biology (or BIOL 101), high school chemistry (or CHEM 114).
- BIOL 156 Natural History and Conservation of the Hawaiian Islands (3) (Y)** The formation of the Hawaiian Islands, establishment of their native terrestrial and marine flora and fauna, and human impacts and conservation. (Same as MARE 156)
- BIOL 156L Natural History & Conservation Hawaiian Islands (1) (IO)** Field trips for Natural History and Conservation Hawaiian Islands. (Same as MARE 156L)
- BIOL 160 Identification of Tropical Plants (3) (AY)** General techniques of identifying plants, with special emphasis on plants in Hawai'i important to man: medicinal and poisonous plants, weeds, crop plants.
- BIOL 171 Marine Biology (3) (S)** Marine organisms: classification, structure, physiology, ecology and adaptations to the marine environment. This course satisfies CAS general education requirements in the Natural Sciences. Pre: Two high school or college science courses, or consent of instructor. (Same as MARE 171)
- BIOL 171L Marine Biology Laboratory (1) (S)** Provides students with direct exposure to the biota of Hawai'i via laboratory work and field trips to sites around Hilo. The course focuses on the identification, natural history, and ecology of common marine organisms. Pre: current or previous enrollment in BIOL/MARE 171. (Same as MARE 171L)
- BIOL 175 Introductory Biology I (3) (S)** Principles of cell structure, replication, and metabolism. Classical and molecular genetics and evolution. Biodiversity of prokaryotes, viruses, fungi, and plants. Plant structure and function. Note: Biology 175 and 176 each are taught Fall and Spring semesters. Students may enroll in either course (but not both) during Fall or Spring semester.
- BIOL 175L Introductory Biology I Laboratory (One 3-hour lab) (1) (S)** Laboratory for Introductory Biology I. Laboratory exercises covering cell structure, replication, and metabolism; classical and molecular genetics; evolution; and biodiversity of prokaryotes, viruses, fungi, and plants. Biology 175L should be take concurrently with Biology 175.
- BIOL 176 Introductory Biology II (3) (S)** Biodiversity of animal-like protists, invertebrates, and vertebrates. Animal tissues, sensory reception and integration, endocrine systems, support and movement, circulation and immunity, gas exchange, digestion, kidney function, reproduction and development. Population and community ecology, energy flow and biogeochemical cycles. Biology 175 and 176 are each taught both semesters. Students may enroll in either course (but not both) during either Fall or Spring semester.
- BIOL 176L Introductory Biology II Lab (One 3-hour lab) (1) (S)** Laboratory for Introductory Biology II. Laboratory exercises covering structure, function, and natural history of animal-like protists, invertebrates, and vertebrates; structure and function of animal tissues; reproduction and development; and community ecology. Biology 176L should be take concurrently with Biology 176.
- BIOL 190 Hawaiian Marine Field Experience (1) (Y)** Provides a unique opportunity for students to experience the marine environment of the Big Island. Course consists of field trips to coastal and underwater sites around the island. Some swimming and snorkeling involved but not required. (Same as MARE 190)
- BIOL 194 Special Topics in Biology (1-3)** Topics chosen by the instructor. The course content will vary. It may be repeated for credit, provided that a different topic is studied.
- BIOL 199 Directed Studies (1-3)** Permission of instructor and statement of planned reading required.
- BIOL 205 General Entomology (2 lec, 1 3-hr. lab) (3) (S)** Structure, classification and identification of insects. Pre: BIOL 175 or 176 or consent of instructor. (Same as ENTO 205)
- BIOL 243-244 Human Anatomy and Physiology (3-3) Yr. (Y)** The anatomy and physiology of the major human organ systems and physiological processes. Pre: BIOL 243 or equivalent or consent of instructor is a prerequisite for BIOL 244.
- BIOL 243L-244L Human Anatomy and Physiology Laboratory (1 3-hr. lab) (1-1) Yr. (Y)** Laboratory study of human anatomy (including mi-

BIOLOGY (BIOL)

College of Arts and Sciences

- BIOL 101 General Biology (3) (S)** A one-semester introductory biology course for non-majors.
- BIOL 101L General Biology Laboratory (1 3-hr. lab) (1) (S)** Laboratory for General Biology. (Optional, but recommended)
- BIOL 125 Introduction to Cell and Molecular Biology (3)(Y)** Introduction to cell and molecular biology for majors in the natural and health sciences. Cell structure and function, the molecular basis of life, metabolic pathways, classical and molecular genetics, the molecular and

- croscopic) and physiology. Pre: concurrent enrollment in BIOL 243-244 or consent of instructor.
- BIOL 250 Statistical Applications in Marine Science (3) (S)** Hands-on approach to the design of field experiments, collection of ecological data, analysis of data on microcomputers using statistical methods, and presentation of results. Requires completion of an independent project using data collected in the field followed by the preparation of both written and oral reports. Pre: MARE/BIOL 171 or MARE 201; and CS 102 or consent of instructor. (Same as MARE 250)
- BIOL 254 Animal Nutrition (3 lec.) (3) (Y)** Comparative animal digestive systems and metabolism. Essential nutrients, their functions, mechanisms of action and interrelationships. Pre: ANSC 141, CHEM 124 and 125, or consent of instructor. (Equivalent to ANSC 254)
- BIOL 264 Quantitative Underwater Ecological Survey Techniques (QUEST) (3) (Y)** The application of commonly utilized near shore underwater ecological surveying techniques using SCUBA. Intensive two-week course combining lecture and field work. Data will be collected in the field, reduced, analyzed and presented in an oral report. (Same as MARE 264)
- BIOL 270 Intermediate Cell and Molecular Biology (3) (S)** Integrated cell and molecular biology for life science majors. Modern advances in recombinant DNA technology. Pre: BIOL 175 and 176 (or BIOL 125) and CHEM 125 or consent of instructor. CHEM 242 recommended and may be taken concurrently.
- BIOL 270L Intermediate Cell and Molecular Biology Laboratory (1 3-hr lab) (1) (S)** Laboratory exercises in cell and molecular biology with an emphasis on the use of modern methods of DNA analysis. Pre: BIOL 175-175L (or BIOL 125), and CHEM 125L or consent of instructor. CHEM 242L recommended and may be taken concurrently. Concurrent enrollment in or prior completion of BIOL 270 is required.
- BIOL 275 Fundamentals of Microbiology (3) (S)** A survey of microbiology with emphasis on bacteria, viruses, infectious diseases and their control. Pre: one semester of college chemistry. Recommended: at least one semester of BIOL 101, 175 or 176.
- BIOL 275L Fundamentals of Microbiology Laboratory (1 3-hr. lab) (1) (S)** Required laboratory for Fundamentals of Microbiology.
- BIOL 280 Biostatistics (3) (S)** Statistical analysis as applied to research in the biological sciences. Theory and applications of statistics; experimental design; basic statistical concepts; hypothesis testing; parametric and non-parametric analyses. Group and independent projects, computer analysis of data.
- BIOL 281L General Ecology Laboratory (1 4-hr. lab) (1) (S)** Laboratory supporting BIOL 281. Reconnaissance field trips to view and sample representative ecosystems, instruction in basic field biology, laboratory demonstrations and use of mathematical and simulation models. Reports written in scientific style. Pre: BIOL 280 or MARE 250 and concurrent registration in BIOL 281..
- BIOL 281L General Ecology Laboratory (1 3-hr. lab) (1) (S)** Laboratory supporting BIOL 281. Reconnaissance field trips to view and sample representative ecosystems, instruction in basic field biology, laboratory demonstrations and use of mathematical and simulation models. Reports written in scientific style. Pre: BIOL 280 or MARE 250 and concurrent registration in BIOL 281.
- BIOL 299 Directed Studies (1-3)** Statement of planned reading or research required. Pre: sophomore standing and consent of instructor.
- BIOL 309 Biogeography (3) (IO)** Basic evolutionary and ecological principles underlying the dynamics of plant and animal populations. Mechanisms of isolation, speciation, dispersal, migration, and competition as they affect past and present world distribution patterns. Island biogeography. Pre: GEOG 101; BIOL 101 or 175 or 176; or consent of instructor. (Same as GEOG 309)
- BIOL 323 Mammalian Physiology (3 lec., 3-hr lab) (4) (Y)** Structure and function of the animal body, including those of the horse, cow, sheep, and pig. A general study of anatomy, but emphasis placed on understanding the physiology of animal systems. Pre: ANSC 141, CHEM 124 or consent of instructor. (Equivalent to ANSC 350)
- BIOL 357 Evolution (3) (Y)** Organic evolution as a unifying theory of biology. Topics include the history of ideas of evolution, adaptation of populations, genetic drift, molecular evolution and the neutral theory, quantitative genetics, speciation and phylogeny, biogeography and macro-evolutionary trends, and mass extinctions. Pre: BIOL 125, 175 or 176.
- BIOL 357L Evolutionary Genetics Laboratory (1 3-hr. lab) (1) (Y)** A laboratory and field course to be taken in conjunction with BIOL 357 lecture. Laboratory exercises will introduce students to the techniques in evolutionary genetics with special reference to Hawaiian plants and animals. Topics to be covered include: quantitative genetics, natural selection, molecular genetics analysis of populations and species, ecological genetics and adaptation, and conservation genetics. Pre: BIOL 175, BIOL 175L, BIOL 176, BIOL 176L, BIOL 270, BIOL 270L, and BIOL 280.
- BIOL 360 Marine Resources (3) (IO)** A survey of human use of the marine environment including physical and biological resources. Topics covered include: fisheries, mariculture, marine mineral and energy resources, chemical resources of sea water, the use of coastal lands and waste disposal in the sea. Pre: MARE 201 or BIOL/MARE 171, or consent of instructor. (Same as MARE 360)
- BIOL 364 Advanced QUEST (3) (Y)** Students lead a dive team learning underwater ecological surveying techniques; supervise field data collection, data reduction and analysis, and team presentation of written and oral reports; and assist in training students in identification of marine organisms. Pre: Scuba certification, UH diving certification, current CPR/first aid, BIOL/MARE 264, and consent of instructor. Students receive CR/NC for the course. (Same as MARE 364)
- BIOL 366 Tropical Marine Research Investigations (3) (Y)** Research projects on marine-related problems. Students will do a literature search; develop experimental design; collect, reduce and analyze data; do a written final report; and present findings at a symposium. Projects will be selected from a list of topics or can be original with the consent of the instructor. Pre: consent of instructor. (Same as MARE 366)
- BIOL 371 Biology of Marine Invertebrates (3) (AY)** A survey of the major groups of invertebrates focusing on those dominant in the marine environment. Students will learn methods used to identify and classify invertebrates and will survey the anatomy, physiology, and natural history of the major groups. Pre: MARE 265 or BIOL 176 or their equivalent, concurrent enrollment in MARE 371L. (Same as MARE 371)
- BIOL 371L Biology of Marine Invertebrates Laboratory (1) (AY)** Direct exposure to the major groups of invertebrates in the marine environment, focusing on those present in Hawai'i. Students will learn to identify and classify invertebrates and will survey the anatomy and natural history of the major groups. Pre: concurrent or previous enrollment in BIOL/MARE 371. (Same as MARE 371L)
- BIOL 375 Biology of Microorganisms (3) (Y)** Combines fundamental principles of microbiology with recent developments in and applications to microbial evolution, ecology, molecular genetics, and immunology. Pre: BIOL 270, BIOL 270L. Offered Spring Semester only.
- BIOL 375L Biology of Microorganisms Laboratory (1) (Y)** Required laboratory for BIOL 375. Pre: BIOL 270, BIOL 270L. Offered Spring Semester only.
- BIOL 381 Conservation Biology (3) (Y)** Principles of conservation biology and their application to the maintenance and enhancement of biodiversity. Philosophical basis for conservation, scientific theories and research methods used by conservation biologists, and case studies of scientific and socio-political interactions in conservation problems. Prerequisites: BIOL 270 and BIOL 281 or consent of the instructor.
- BIOL 384 Primatology (3) (AY)** Evolutionary approach to the nonhuman primates. Biological and behavioral adaptations of primates to their ecological setting. Implications of primate adaptations for understanding human biology and behavior. Pre: ANTH 115, or BIOL 176. (Same as ANTH 384)
- BIOL 392 Biology and Philosophy (3) (AY)** Philosophical examination of the implications of modern biology for how we understand ourselves and our relations to the natural world. Evolutionary, genetic,

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- developmental, and ecological topics will be discussed. Pre: previous work in Philosophy or Biology, or consent of the instructor. (Same as PHIL 392)
- BIOL 399 Directed Studies (1-3)** Statement of planned reading or research required. Pre: junior standing and consent of instructor.
- BIOL 410 Biochemistry (3) (Y)** Basic compositions and functions of biological matter, metabolic interconversions and transformations; the bioenergetics involved and the levels of control over these processes. Pre: BIOL 125 or 270, CHEM 242, PHYS 107 or 171, or consent of instructor. CHEM 330 and 350 or 351 recommended.
- BIOL 410L Biochemistry Laboratory (1 6-hr. lab per week) (2) (Y)** Electrometric titration and chromatographic analysis of amino acids, advanced quantitative assay of proteins, advanced quantitative assay, purification and kinetic analysis of enzymes. Required laboratory for Biochemistry. Pre: concurrent enrollment in BIOL 410 and completion of BIOL 270L, CHEM 242L and PHYS 171L or consent of the instructor. CHEM 330L and CHEM 350L or 351L recommended.
- BIOL 415 Cell Biology (3) (Y)** Ultrastructural and molecular aspects of cell membranes, cellular energetics, cell mobility, cellular synthesis and growth, and cell division. Pre: BIOL 410.
- BIOL 415L Cell Biology Laboratory (1 4-hr. lab per week) (1) (Y)** Light and electron microscopy of selected cells. Optional laboratory for Cell Biology. Pre: concurrent enrollment in BIOL 415 and completion of BIOL 270L or consent of instructor.
- BIOL 417 Plant Anatomy (4) (Y)** (HORT 437, college of agriculture, may be taken for biology credit as BIOL 417.)
- BIOL 425 Water Quality and Aquatic Productivity (2 lec., 1 lab) (3) (Y)** (Aquaculture 425, College of Agriculture, may be taken for biology credit as BIOL 425.) (Same as MARE 420) Study of water quality and aquatic productivity as it relates to aquaculture and fisheries. Pre: CHEM 124 or consent of instructor.
- BIOL 443 Ecological Animal Physiology (3) (Y)** Study of the physiological adaptations of animals to environmental variation including physiological and biochemical mechanisms for food acquisition and digestion, thermal energetics, respiratory gas exchange, activity metabolism, and osmoregulation. Pre: BIOL 270 or consent of instructor and concurrent registration in BIOL 443L.
- BIOL 443L Ecological Animal Physiology Laboratory (2) (Y)** A laboratory and field course on physiological adaptation to environmental variation. Initial laboratory exercises cover techniques and technology for making physiological measurements. During the remainder of the semester, students use these techniques in group research projects in the laboratory or field and gain experience in experimental design, data analysis, and report writing. Pre: BIOL 270 and concurrent registration in BIOL 443 or consent of instructor.
- BIOL 450 Physiology of Reproduction (3) (Y)** Livestock reproductive anatomy and physiology. Pre: ANSC 141. ANSC 350 recommended. (Equivalent to ANSC 450)
- BIOL 466 Genetics (3) (Y)** Classical, molecular, and population genetics. Pre: BIOL 410.
- BIOL 466L Genetics Laboratory (2 3-hr. lab per week) (2) (Y)** Classical genetics usually including crosses with flies, worms and yeast. Molecular genetics usually including DNA gel analysis, construction of recombinant DNA molecules and their expression in transgenic organisms, and Polymerase Chain Reaction amplification of DNA. Optional laboratory for genetics. Pre: concurrent enrollment in BIOL 466 and completion of BIOL 270L and BIOL 410L or consent of the instructor.
- BIOL 475 Fish Population Dynamics (2 lec., 1 lab) (3) (Y)** (AQUA 475, College of Agriculture, may be taken for biology credit as BIOL 475.)
- BIOL 481 Theory and Methods of Ecology and Evolution (3) (Y)** The major subdisciplines of ecology and evolutionary biology, with emphasis on the models and methodologies of areas of active research. Taught using examples of published research. Pre: BIOL 270-270L, 281-281L, 357-357L, 380, and concurrent registration in BIOL 481L.
- BIOL 481L Ecology and Evolution Research Methods (2) (Y)** Intensive field-laboratory supporting BIOL 481. Research topics selected from current fields of active research within ecology and evolution. Develop research hypotheses, gather data from field sites, analyze and interpret data and write reports in the style of scientific papers. Concurrent registration in BIOL 481 required.
- BIOL 482H Honors Application of Ecology and Evolution (3) (Y)** Practical experience in performing research projects in ecology, evolution and conservation biology. Students will submit project proposals for evaluation and approval, do a thorough literature review, develop an experimental design, and collect and analyze data. Students will also prepare a final written report and give a 15-minute seminar presentation on their projects. Pre: BIOL 443L, BIOL 481 and 481L; 3.5 GPA or consent of instructor with departmental approval.
- BIOL 484 Biology of Fishes (3) (AY)** The biology of marine and freshwater fishes. Topics covered include: general anatomy, locomotion, respiration, osmoregulation, sensory systems, reproduction, electrosensitive and electrogenic fishes, coloration and bioluminescence in fishes, migratory patterns, trophic ecology, territorial behavior, and phylogenetic interrelationships. Pre: BIOL/MARE 171 or BIOL 176 or their equivalent, or consent of instructor. (Same as MARE 484)
- BIOL 484L Biology of Fishes Laboratory (1 3-hr. lab) (1) (IO)** Anatomy of jawless, cartilaginous and bony fishes. Review of common local reef fishes. Optional laboratory and field trips for Biology of Fishes. (Same as MARE 484L)
- BIOL 494 Special Topics in Biology (1-3)** Advanced topics chosen by the instructor. The course content will vary and may be repeated for credit, provided that a different topic is studied.
- BIOL 495A Seminar (1) (S)** Lectures, discussions and research reports of topics in biology presented by faculty, students, and visiting scholars. Students attend seminars and receive CR/NC grade for the course.
- BIOL 495B Seminar (1) (S)** Lectures, discussions, and research reports of topics in biology presented by faculty, students and visiting scholars. Each student must attend seminars and present a talk to receive a CR/NC grade for the course.
- BIOL 496 Teaching Assistance and Tutoring in Biology (1-3) (S)** Practice in individual tutoring, and in the preparation and presentation of selected topics in Biology lecture or laboratory courses, under direct instructional supervision. This course may be repeated for a maximum of 6 credits and may not be used to replace any specific course requirements of the Biology major other than elective units. Statements of planned teaching assistance and tutoring activities required. Pre: consent of the supervising instructor and the department chair.
- BIOL 499 Directed Studies (1-3)** Statement of planned reading or research required. Pre: senior standing and consent of instructor.

BUSINESS (BUS)

College of Business and Economics

- BUS 100 Introduction to Business (3) (S)** A study of business functions, methods of business operation, types of business ownership, and the role of business organizations in contemporary society.
- BUS 240 Business Law (3) (S)** The law of contracts, agency and employment, and the elements of property and government regulation. Law of business organizations, with emphasis on partnerships and corporations and law of sales and commercial paper. Pre: sophomore standing.
- BUS 400 Internship (3) (S)** Supervised on-the-job experience in the business community. Comprehensive report by student, meetings with faculty advisor, and performance evaluation from employer required. May be repeated for a total of 6 credits. Pre: MGT 300, MKT 310, FIN 320, QBA 361, QBA 362; minimum cumulative GPA of 3.00; compatibility with career interests; consent of instructor; pre-approved job placement and internship contract.

CHEMISTRY (CHEM)

College of Arts and Sciences

- CHEM 111 Chemistry for Non-Science Majors (3) (IO)** A basic principles course designed for students in the humanities and social sciences.

- Current problems and the factors affecting them are presented from a simplified chemical viewpoint.
- CHEM 111L Chemistry for Non-Science Majors Laboratory (1 3-hr. lab) (1) (IO)** Laboratory principles and techniques presented from the non-science major viewpoint. When possible, experiments will involve everyday phenomena.
- CHEM 114 Introductory Chemistry (3) (Y)** Introduction to basic chemical principles. Pre: competence in high school algebra as demonstrated by a) the math placement test or b) the first 20 questions of the ACS chemistry placement exam. (Both exams are offered at UH Hilo)
- CHEM 114L Introductory Chemistry Laboratory (1 3-hr. lab) (1) (Y)** Introduction to basic chemical laboratory principles and techniques. Pre: concurrent registration in CHEM 114.
- CHEM 124-125 General Chemistry I, II (3-3) Yr. (S)** A mathematically rigorous introduction to chemistry designed for majors in the natural sciences. Pre: high school chemistry (or CHEM 114) and high school algebra (or MATH 104) and placement by exam. Concurrent registration in CHEM 124D-125D and 124L-125L required. (CHEM 124 and 124L satisfy General Education requirements)
- CHEM 124D-125D General Chemistry I/II Discussion Section (1-1) Yr. (S)** Applied problem solving methods discussion section that will cover topics presented during the lecture. The discussion section is required to be taken concurrently with the corresponding General Chemistry (CHEM 124/125) lecture section.
- CHEM 124L-125L General Chemistry Laboratory I, II (1 3-hr. lab) (1-1) Yr. (S)** Experiments illustrating the fundamental principles and techniques of chemistry. Pre: concurrent registration in CHEM 124-125.
- CHEM 141 Survey of Organic Chemistry and Biochemistry (3) (Y)** Brief introduction to organic chemistry, and selected topics in biochemistry of interest to students in health and related fields.
- CHEM 141L Organic Chemistry and Biochemistry Laboratory (1 4-hr. lab) (1) (Y)** Introduction to Organic Chemistry and Biochemistry laboratory principles and techniques. Pre: concurrent registration in CHEM 141.
- CHEM 241-242 Organic Chemistry (3-3) Yr. (Y)** The study of carbon compounds. Topics include molecular structure, stereochemistry, molecular spectroscopy, reactions and methods of preparation of principal classes of organic compounds. Reaction mechanisms. Pre: CHEM 125-125L or consent of instructor.
- CHEM 241L-242L Organic Chemistry Laboratory (1 4-hr. lab) (1-1) (Y)** Techniques of organic chemistry, including synthesis and qualitative analysis. Applications include spectroscopy and chromatography. Pre: concurrent registration in CHEM 241-242.
- CHEM 299 Directed Studies (1-3) (S)** Statement of planned reading or research required. Pre: sophomore standing and consent of instructor.
- CHEM 330 Quantitative Analysis (2) (Y)** The principles of modern quantitative analysis. Pre: CHEM 125-125L and concurrent registration in CHEM 330L.
- CHEM 333 Quantitative Analysis with Laboratory (5) (Y)** Expanding upon general chemistry principles for application in quantitative analysis. Extensive training in laboratory techniques and report writing. Pre: Receive a C or better in CHEM 125 and 125L.
- CHEM 331-331L Instrumental Analysis (2 lec., 2 3-hr. lab) (4) (Y)** Introductory instrumental analysis for chemistry majors but recommended for other natural science majors. Pre: CHEM 330-330L or consent of instructor.
- CHEM 341-341L Qualitative Organic Analysis (2 lec., 2 3-hr. lab) (4) (IO)** Identification and characterization of organic compounds and mixtures by chemical and spectroscopic techniques. Pre: CHEM 242-242L or consent of instructor.
- CHEM 350 Physical Chemistry for the Life Sciences (3) (AY)** Principles and theories of Physical Chemistry as applied to the life sciences. FOR Chemistry majors and other natural science majors. Pre: CHEM 242, MATH 205 or consent of instructor.
- CHEM 350L Physical Chemistry for the Life Sciences Laboratory (1 lec., 1 4-hr lab) (2) (AY)** Laboratory techniques in Physical Chemistry with emphasis in the life sciences. Pre: CHEM 125L and CHEM 350, which may be taken concurrently.
- CHEM 351 Physical Chemistry I (3) (AY)** Principles and theories of physical chemistry at the macroscopic level such as thermodynamics, phase equilibria, and kinetics. FOR chemistry majors and other physical science majors. Pre: CHEM 242, MATH 206, which may be taken concurrently, or consent of instructor. PHYS 171 is recommended.
- CHEM 351L Physical Chemistry Laboratory (1 4 hr. lab) (1) (AY)** Laboratory techniques in physical chemistry at macroscopic level. Pre: CHEM 351, which may be taken concurrently.
- CHEM 352 Physical Chemistry II (3) (AY)** Principles and theories of physical chemistry at the microscopic level such as quantum mechanics, molecular spectroscopy, and reaction dynamics. FOR chemistry and other physical science majors. Pre: CHEM 351, PHYS 171, MATH 231, which may be taken concurrently, or consent of instructor.
- CHEM 352L Physical Chemistry Laboratory (1 4 hr. lab) (1) (AY)** Laboratory techniques in physical chemistry at microscopic level. Pre: CHEM 352, which may be taken concurrently.
- CHEM 360 Environmental Chemistry (3) (Y)** We will use chemical concepts and principles to explore and understand the environment. Natural and anthropogenic aspects of environmental chemistry will be addressed including chemical cycles and systems, pollution, "green" chemistry, and how chemical events can affect local and global processes. Pre: CHEM 125 with C or better. Offered Fall semester only.
- CHEM 380 Principles of Industrial Hygiene and Toxicology (3) (Y)** Essential principles of Industrial hygiene and toxicology with an emphasis on workplace hazards encountered in the Hawai'i, Asia, Pacific region.
- CHEM 394 Special Topics in Chemistry (3) (IO)** Advanced topics chosen by the instructor. The course content will vary. It may be repeated for credit, provided that a different topic is studied. Pre: junior standing and consent of instructor.
- CHEM 399 Directed Studies (1-3) (S)** Statement of planned reading or research required. Pre: junior standing and consent of instructor.
- CHEM 421 Intermediate Inorganic Chemistry (3) (AY)** The classification of inorganic compounds, description and fundamental theories. Course includes molecular orbital consideration. Pre: credit or concurrent registration in CHEM 352. MATH 206 is recommended.
- CHEM 431-431L Instrumental Analysis (2 lec., lab TBA) (4) (AY)** Introductory instrumental analysis for chemistry majors but recommended for other natural science majors. Pre: CHEM 330-330L with C or better or consent of instructor.
- CHEM 441 Intermediate Organic Chemistry (3) (IO)** The study of more advanced topics in organic chemistry, such as physical organic chemistry, natural products, advanced synthesis, macromolecules, and molecular spectroscopy. Pre: CHEM 242.
- CHEM 451 Intermediate Physical Chemistry (3) (IO)** Advanced topics in Physical Chemistry such as chemical kinetics, molecular spectroscopy, electrochemistry, thermodynamics and statistical thermodynamics, surface chemistry, and crystallography. Pre: CHEM 352 or consent of instructor.
- CHEM 487 Environmental Toxicology (3) (AY)** Biochemical basis for toxicity. Chemical distribution and fate in the body; molecular mechanisms and effects of toxic action. Emphasis on environmental toxicants. Pre: upper-division courses in biochemistry and physiology, or consent of instructor.
- CHEM 495A-495B Seminar (1-1) Yr. (S)** Seminar presentations of topics in the physical sciences by faculty, enrolled students and invited speakers. The first semester (495A) is taken CR/NC; in the second semester (495B), students are required to present a seminar for a letter grade. Pre: senior standing or consent of instructor. (Same as ASTR 495A-495B, PHYS 495A-495B, GEOL 495A-495B and MATH 495A-495B)
- CHEM 499 Directed Studies (1-3) (S)** Statement of planned reading or research required. Pre: senior standing and consent of instructor.

CHINESE (CHNS)**College of Arts and Sciences, Languages**

CHNS 101-102 Elementary Chinese (4-4) Yr. (Y) Development of listening, speaking, reading and writing Mandarin Chinese. Structural points introduced inductively. Laboratory drill.

CHNS 201-202 Intermediate Chinese (4-4) Yr. (IO) Second-level training in listening, speaking, reading and writing skills. Pre: CHNS 101-102 or consent of the instructor.

COMMUNICATION (COM)**College of Arts and Sciences**

COM 100 Human Communication in a Diverse Society (3) (S) The role of human communication in meeting the task and social needs of a multicultural society. Emphasis on communication concepts, principles, and cultural issues in interpersonal, small group, organizational, public, mediated, and global contexts.

COM 199 Directed Studies (1-3) Permission of instructor and statement of planned reading or research required.

COM 200 Fundamentals of Interpersonal Communication (3) (Y) The fundamental concepts of interpersonal communication: verbal and non-verbal communication in face-to-face encounters.

COM 231 Oral Interpretation of Literature (3) (AY) Principles of interpretative reading. Practice in textual analysis. Training in individual and group performance techniques. Development, arrangement, and performance of program. (Same as DRAM 231)

COM 241 Health Culture and Diversity (3) (AY) This course is an overview of the study of health communication. It is aimed to provide exposure to concepts and principles in the field, focusing on advocacy and individual awareness in current events. Topics will include the dynamics shared between health care providers and patients, the role of mass media, promotion of public health campaigns, and culturally diverse approaches to health care. Offered Fall Semester only.

COM 251 Public Speaking (3) (Y) Analysis, preparation and delivery of speeches. Emphasis on content, organization and style.

COM 260 Mass Communication (3) (AY) Historical and contemporary overview of television, radio, film, and the press in American culture.

COM 270 Introduction to Theories of Human Communication (3) (Y) Examination of the theoretical foundations of the human communication discipline. Coverage of traditional and contemporary theories in such areas as interpersonal, small group, organizational, intercultural, public and mass communication.

COM 285 Introduction to News Writing and Reporting (3) (Y) Prepares students to write for newspapers, the Internet, and other journalistic outlets. Includes coverage of news conferences, county council meetings, trials, sports, and writing feature stories. (Same as ENG 285)

COM 299 Directed Studies (1-3) Permission of instructor and statement of planned reading or research required. Pre: sophomore standing.

COM 340 Interviewing (3) (AY) This course focuses on the interview process as a collaborative dialogue. Emphasis is placed on framing the interview, listening ethics, cultural diversity, and the development of interviewing skills. Pre: COM 200 or consent of instructor.

COM 350 Introduction to Human Communication Research (3) (AY) An introduction to basic communication research approaches, reviewing the literature, and reporting research.

COM 351 Communication in the Multicultural Workplace (3) (AY) This course provides intercultural insights into organizational communication and addresses leadership and membership, decision-making, and conflict resolution in the multicultural workplace.

COM 352 Communication in Small Groups (3) (AY) Discussion processes in small groups. Effects of variables such as group organization, leadership, membership, goals on how a group attempts to achieve its purpose.

COM 354 Communication in Innovation (3) (AY) The role of communi-

cations as a change agent in society. Communication strategies in diffusion of information.

COM 359 Intercultural Communication (3) (AY) Linguistics and non-verbal variables that influence the effectiveness of cross-cultural communication.

COM 360 Impact of the Mass Media (3)(AY) Analysis of some of the major effects of the mass media on the individual and society.

COM 361 Media Ethics and Law (3) (Y) Media Ethics and Law is an introduction to the ethical and legal issues related to communication and speech. It also gives students a better understanding of the U.S. Constitution and its role in our legal system. Students are provided tangible guidelines within which to communicate. They will understand how and why speech is protected and when that speech crosses the line into becoming unprotected speech. Offered Fall Semester only.

COM 365 Modern American Cinema (3) (AY) The study of American film since WWII, drawing from such film genres as the detective-hero, the musical, the western, comedy, social realism, and melodrama.

COM 370 Persuasion (3) (AY) Inquiry into the nature of persuasion or attitude change with focus on the message as a major determinant of the effects of persuasion on receivers.

COM 375 Nonverbal Communication (3) (Y) The nonverbal dimensions of human communication.

COM 391 General Semantics (3) (AY) Understanding language, verbal meaning and implication, roles of perception and assumption (inference and judgment) in human relationships.

COM 399 Directed Studies (1-3) Statement of planned reading or research required. Pre: junior standing and consent of instructor.

COM 400 Seminar in Human Dialogue (3) (AY) An exploration of the writings of those who contemplate "dialogue", generally considered to be the highest quality form of human communication. Pre: COM 200 and 251 or consent of instructor.

COM 420 Family Communication (3) (AY) Foundational concepts and theories are introduced. Communication dynamics within families are explored. Narrative, functional, interpretive, and systems approaches to family communication are included. Cultural influences are examined. Conditions necessary for optimal family functioning are addressed. (same as WS 420)

COM 440 Organizational Communication (3) (AY) Organizational communication is an intensive consideration of the role of human communication in organizational effectiveness. The course emphasizes both theory and practice and focuses on historical and contemporary trends affecting organizations. Pre: COM 200 and 251 or consent of instructor.

COM 441 Leadership and Communication (3) (AY) Relationships between communication and leadership including a consideration of relevant theories, concepts, tools, and skills. Leadership and communication are examined in relation to organizational culture, change, diversity, technology and decision making. Pre: COM 200 and 251 or consent of instructor.

COM 442 Communication and Conflict (3) (AY) Relationship between human communication and conflict. The relationship among personal history, culture, gender, power, communication, and conflict is considered. Students gain experience in assessing and intervening in conflict situations in both professional and personal contexts. Western, Eastern, and Hawaiian approaches to conflict management are included. Pre: COM 251 or consent of instructor.

COM 444 Public Relations (3) (AY) An overview of the practice of public relations in business, educational institutions, non profit organizations, and government. Students will learn how to interact with public relations professionals, the media, write press releases, and design and evaluate campaigns. Pre: COM 251 or consent of instructor.

COM 451 Communication and Ethnography (3) (AY) Study of ethnography as a qualitative research method. Opportunities to collect data in the field by participating and observing (writing field notes, videotaping, and/or audio taping), interviewing (videotaping or audio taping), and investigating texts (documents, diaries, photographs, films, etc.) are provided. New ethnographic form such as autoethnography, co-con-

structured narrative, interactive interviewing, creative non-fiction, poetry, fiction, and performance are introduced. Includes 1-3 field trips during the semester.

COM 455 Communication and Culture of Asian Americans (3) (AY) Examination of communication patterns of the major Asian-American ethnic groups. Particular emphasis will be placed on the influence of ethnic-cultural identities, cultural variability, immigration patterns, and other relevant issues on the communication behavior of Asian Americans.

COM 456 Asian Perspectives on Communication (3) (AY) This course surveys indigenous concepts and theories of Asian cultures and communication and compares Eastern and Western perspectives on humans communicating. Fall Semester only.

COM 457 Japanese Culture and Communication (3) (AY) This course explores aspects of Japanese communication from cross-cultural perspectives and examines problems in intercultural interactions between Japanese and non-Japanese. Offered Spring Semester only. Same as JPST 457.

COM 460 Mass Media Analysis (3) (AY) Advanced study in mass communication theory, analysis, and criticism, with emphasis upon the electronic mass media. Pre: COM 260 or 360 recommended.

COM 475 Seminar in Listening (3) (Y) The exploration of effective and ineffective listening behaviors in everyday life is the primary course topic. Research and scholarship on the topic of listening will be surveyed. An effort will also be made to refine students' actual listening skills. Pre: COM 200.

COM 494 Special Topics in Speech and Communication (1-3) (IO) Advanced-level topics chosen by the instructor. The course content will vary and the course may be repeated for credit, provided that a different topic is studied. Pre: junior standing or consent of instructor.

COM 499 Directed Studies (1-3) Statement of planned reading or research required. Pre: senior standing and consent of instructor.

COMPUTER SCIENCE (CS)

College of Arts and Sciences

CS 100 Principles of Computer Science (3) (S) General survey of the entire field of computer science. Principles of machine architecture, human/machine interface, data organization, and their interrelationship.

CS 101 Digital Tools for the Information World (3) (S) Hands-on computer class with emphasis on producing professional-level documents, spreadsheets, presentations, databases, and web pages for problem solving. Includes concepts, terminology, and a contemporary operating system. Prepares students for the UH Hilo College of Business and Economics mandatory "Computer Competency Certification" test and meets requirements for UH Manoa College of Business, Biology program, and Botany Department.

CS 102 MS Office Tools for Math and Science (3) (S) Use of symbols, equations, images in scientific documents. Computations using spreadsheets with sums, averages, and scientific functions. Data analysis: curve fitting, interpolation, statistics. Data presentation: visualization, charts, and graphs. Symbolic computation. Database processing: forms, queries, reports, VBA. Additional topics chosen from: real-time data acquisition, more advanced statistical methods, system simulation. Intended for science majors. (Same as MATH 111) (Satisfies a Quantitative Reasoning General Education requirement as a Mathematics course)

CS 110 Visual Basic Programming (3) (S) An introduction to windows-based programming using Visual Basic. Topics covered include the Visual Basic environment, user-interface design, data types, scope, control structures, data structures, graphics, and software engineering.

CS 130 Beg Graphics, Game Programming (3) (S) Introduction to 2-D graphics and game programming: graphic elements, layers, and simple animation; principles of game design and implementation; emphasis on Flash and Action Script programming; game physics; simple AI techniques. Previous programming experience helpful but not required.

CS 135 Animation Programming (3) (S) A gentle introduction to programming with user-friendly software (Alice). Students use storyboard-

ing design strategies and create Disney/Pixar-like animations with objects in 3D virtual worlds. These animations promote an understanding of basic programming constructs, including control structures and object-oriented programming. Projects based on Hawaiian and Pacific themes will be emphasized. Open to all students; especially intended for those with no programming experience. Computer science majors may take this course to prepare for CS 150.

CS 137 Digital Media with Flash (3) (Y) Use digital images, sounds, and video to create slide shows, animations, podcasts, tutorials, demonstrations, e-portfolios, etc. Save to DVD and web pages. Learn Flash and other software. Students may use existing content such as research project photos. Pre: Any prior CS course or permission of instructor.

CS 141 Discrete Mathematics for Computer Science I (3) (Y) Includes logic, sets, functions, matrices, algorithmic concepts, mathematical reasoning, recursion, counting techniques, probability theory. Not open to student with credit in MATH 310. Pre: MATH 104, or 104F and 104G, or consent of instructor. Offered in Spring semester only.

CS 150 Introduction to Computer Science I (3) (S) Intended for Computer Science majors and all others interested in the first course in programming. An overview of the fundamentals of computer science emphasizing problem solving, algorithm development, implementation, and debugging/testing using an object-oriented programming language. Co-requisite: MATH 104 or MATH 205.

CS 151 Introduction to Computer Science II (3) (S) Reinforces and strengthens problem solving skills using more advanced features of programming languages and algorithms such as recursion, pointers, and memory management. Emphasizes the use of data structures such as arrays, lists, stacks, and queues. Pre: CS 150.

CS 200 Web Technology I (3) (S) Introductory web page authoring. Creation of client-side web pages using web authoring language and style sheets. Consideration of graphical design elements, validation, browser compatibility, and accessibility. Use of scripting language to add dynamic elements to web pages.

CS 201 Web Technology II (3) (Y) Intermediate web page authoring. Creation of web pages that present data from XML sources and use XSLT transformations. Development of an e-commerce web site that uses a standard browser to accept user input, processes the user input with business logic, and connects to a backend SQL database. Publication of Web site to a web server. Pre: CS 200 or consent of instructor.

CS 241 Discrete Mathematics for Computer Science II (3) (Y) Includes functions, matrices, graph theory, trees and their applications, Boolean algebra, introduction to formal languages and automata theory. Pre: CS 141 and MATH 205. Offered in Fall semester only.

CS 266 Computer Organization and Assembly Language (3) (Y) Organization of computers; assembly language; instruction sets; CPU; memory; input/output; interrupts; DMA. Pre: CS 150.

CS 299 Directed Studies (1-3) (IO) Statement of planned reading or research required. Pre: sophomore standing and consent of instructor.

CS 300 Web Site Management (3) (AY) Advanced topics in web site administration. Issues covered include: site management (operating system, web server and database installation and administration); security (cryptography, authentication, digital certificates); and content (site design, ethical and business considerations). Pre: CS 201 or consent of instructor.

CS 321 Data Structures (3) (Y) Basic concepts of space/time efficiencies. Algorithms and data structures for searching (binary search trees, AVL trees, hash tables) and sorting. Graph algorithms. Data compression using Huffman codes. Pre: CS 151 and 241 or consent of instructor.

CS 340 Graphical User Interfaces (3) (AY) Study of the graphical user interface as applied to computer software. Examination of history, human factors, design, technology and implementation of graphical user interfaces. Co-requisite: CS 321.

CS 350 Systems Programming (3) (AY) Introduction to systems programming in the UNIX environment. Topics include the UNIX command shells and scripting, the C programming language, UNIX programming tools and system calls, processes and process management, file and console I/O, and other selected topics. Designed for students interested in

- scientific, engineering or systems programming, systems administration or graduate education in computer science. Pre: CS 151
- CS 407 Introduction to Numerical Analysis I (3) (AY)** Solutions of equations in one variable, direct and iterative methods for systems of linear equations, the algebraic eigenvalue problem, interpolation and polynomial approximation, error analysis and convergence for specific methods. Offered Spring semester. Pre: C in MATH 206 and MATH 311 and programming experience. (Same as MATH 407)
- CS 410 Elements of Computer Architecture (2 lec., 1 3 hr. lab) (3) (AY)** Basic machine architecture, cache memory, computer arithmetic, RISC, instruction-level parallelism, superscalar processors, microprogrammed control, parallel processing. Performance evaluation. Pre: CS 266, 321
- CS 420 File Management (3) (AY)** Concepts and methods for managing persistent data. Study of stream, sequential, relative and indexed organizations. Implementation techniques and performance. Introduction to SQL. Embedded SQL as a data access technique. Pre: CS 321.
- CS 421 Database Management System Design (3) (AY)** Data models: hierarchical, network, relational, object oriented. Relational database management systems. Database design. Client/server systems. Web access to databases. Pre: CS 420.
- CS 422 Advanced Database Systems (3) (AY)** Further study of database design. Administrative and user capabilities of a modern database management system. Database security. Transaction management. Database programming: client and server. Two-tier and three-tier client server systems. Web services and mobile applications. Data transformation. XML as a data transport, and storage mechanism. Pre: CS 421.
- CS 430 Operating Systems (3) (AY)** Covers the concepts, issues and design of modern operating systems. Topics include processes and state, concurrency, resource management algorithms for memory, processors and I/O devices, protection and security. Case studies of popular workstation, server and mainframe operating systems. Laboratory projects teach concurrent programming and OS implementation techniques. Pre: CS 266, CS 321.
- CS 431 Computer Networks and Data Communications (3) (AY)** Thorough survey course covering major networking concepts such as link-level flow, error control, congestion control and QOS. Modern network protocols such as TCP/IP, ATM, frame relay, Ethernet, fiber channel and wireless LANs will be compared and contrasted. Pre: CS 321.
- CS 435 Information Assurance (3) (AY)** An overview of the field of information assurance and computer security. Covers issues of confidentiality, integrity, and availability that arise in different areas of computer technology, as well as legal, ethical, and managerial aspects of security. Pre: CS 321
- CS 440 Artificial Intelligence (3) (IO)** Fundamental concepts of artificial intelligence including problem solving, heuristic search and knowledge representation. Discussion of applications such as game playing, theorem proving, and knowledge based expert system. Pre: CS 321.
- CS 450 Organization of Programming Languages (3) (AY)** Advanced introduction to the concepts and issues in the design of computer programming languages. Topics include classification of languages, types, semantics, special forms, parameter passing, closures, object-orientation, continuations, concurrency, exceptions, interpreters and garbage collection. Laboratory projects highlight design decisions and teach interpreter implementation techniques. Pre: CS 321.
- CS 451 Compiler Theory (3) (AY)** Study of LL, LR, LALR grammars and compiler techniques suitable for programming languages for use in constructing scanners, parsers, code generators, code optimizers for a compiler. Use of compiler construction tools such as lex and yacc to develop a compiler for a block structured programming language. Pre: CS 321.
- CS 460 Software Engineering I (3)(AY)** Emphasizes planning, analysis, and design phases of the Software Development Life Cycle with one model of the SDLC covered. Goal is to learn tools and techniques for sound requirement assessment and, working as a team, produce a verified design of a real software product. Pre: CS 321, ENG 209 or ENG 225.
- CS 461 Software Engineering II (3)(AY)** Emphasizes implementation, installation and maintenance phases of the SDLC covered in CS 460. Goals are to learn specific techniques and tools for product development testing, measurement and documentation. Team will complete product. Pre: C or better in CS 460 the previous semester.
- CS 470 Theory of Computing (3) (AY)** Study of various models of computation and their relation to formal languages: finite automata, push-down automata, Turing machines, regular, context-free, and recursively enumerable languages. Unsolvability, NP completeness. Pre: CS 321.
- CS 482 Computer Graphics (3) (IO)** Principles for the design, use, and understanding of graphics systems. Both hardware and software components are examined. Pre: MATH 311 and CS 321.
- CS 494 Special Topics in Computer Science (1-3) (S)** Special topics chosen by instructor. Course content will vary. May be repeated once for credit provided that a different topic is studied.
- CS 495 CS Professional Seminar (1) (AY)** Computer Science and Software Engineering are careers demanding technological and ethical application of computer hardware, software and human factors. Course emphasis is on entry into and growth in these careers showing the balancing of needs amongst technology, employee, employer and society. Co-requisite: CS 461.
- CS 499 Directed Studies (1-3)** Statement of planned reading or research required. Pre: senior standing and consent of instructor.

DANCE (DNCE)

College of Arts and Sciences, Performing Arts Department

- DNCE 110 Pilates Beginning Matwork (1) (Y)** Body conditioning program in Pilates method. Emphasis on fundamentals and beginning mat exercises.
- DNCE 150 Introduction to Dance (3) (AY)** History, scope, and theory of human movement. Study of the correlation of dance, music, and visual expression. Not a performance course.
- DNCE 160 Ballet I (3) (Y)** Introduction to classical ballet. Movements, techniques and appreciation of ballet. Previous dance experience not required. May be repeated once for credit.
- DNCE 180 Jazz Dance I (3) (Y)** Introductory course in jazz dance style and techniques. May be repeated once for credit.
- DNCE 190 Modern Dance I (3) (Y)** Basic techniques of Modern Dance as an art form. May be repeated once for credit.
- DNCE 210 Pilates Intermediate Matwork (1) (Y)** Continuation of DNCE 110. Emphasis on additional strength and stamina skills. Pre: DNCE 110 or consent of instructor.
- DNCE 250 Dance Techniques (2) (AY)** Study of the basic vocabulary of dance and the collaborative contributions of choreographers, dancers and musicians. Experiential work in the development of basic stage movement, including understanding of period demands. May be taken concurrently with music and drama technique courses. Required for all Performing Arts majors
- DNCE 260 Ballet II (3) (Y)** Continuation of Ballet I. Movements, techniques, and appreciation of ballet. Emphasis on developing strength, flexibility, and control in classical balletic style. Pre: DNCE 160 or consent of instructor. May be repeated once for credit.
- DNCE 280 Jazz Dance II (3) (AY)** A continuation of Jazz Dance I. May be repeated once for credit. Pre: DNCE 180 or consent of instructor.
- DNCE 290 Modern Dance II (3) (Y)** Second level Modern Dance. Designed to develop physical flexibility, body control, and a more acute rhythmic sense. May be repeated once for credit. Pre: DNCE 190 or consent of instructor.
- DNCE 360 Ballet III (3) (AY)** Intermediate ballet technique for the dancer with previous training. Begins the study of pointe work for qualified females and jumps and turns specifically for males. Pre: DNCE 160, DNCE 260 or consent of instructor. May be repeated once for credit.
- DNCE 371 Choreography (3) (Y)** An introduction to the basic techniques of creating dance. Public performance required. May be repeated once for credit. Pre: DNCE 180 or 190, consent of instructor.
- DNCE 401 Dance Ensemble (3) (Y)** Preparation and performance of

techniques and repertoire at the advanced level. Public performance required. May be repeated for credit. Pre: audition.

DNCE 419 Dance in Education (3) (AY) Dance activities for young people. Appropriate for teachers, group workers, recreation majors, and others working with children. Supervised field activities. Pre: Performing Arts Core, upper-division standing or consent of instructor.

DNCE 450 History of Dance (3) (AY) Development of Western theatrical dance from Ancient Greece through 19th-century ballet to the present, including modern dance, contemporary ballet, and dance forms of musical theater and film. Pre: Performing Arts Core, upper-division standing or consent of instructor.

DNCE 460 Ballet IV (3) (AY) Intermediate/advanced ballet technique with the continuation of pointe work for qualified females. Introduction to classical partnering work. Pre: DNCE 360 and audition. May be repeated once for credit.

DNCE 494 Special Topics in Dance (1) (AY) Focused study of a specific area of dance. Readings, research and/or field experiences. Topics may include notation, improvisation, Alexander technique, ethnic dance, folk dance, Graham technique, character dance, ballroom dance, musical theatre techniques, tap dance, etc. Pre: Performing Arts Core, DNCE 160, 180, 190 or consent of instructor. Repeatable if topic changes.

DNCE 499 Directed Studies: Senior Project (3) Statement of planned reading, research and/or performance. Can be used for senior project after permission of instructor. Pre: Senior standing.

DRAMA (DRAM)

College of Arts and Sciences, Performing Arts Department

DRAM 170 Introduction to Theater (3) (Y) Required for all Performing Arts majors. Theatre history and play analysis from the standpoint of production. Lab work in three aspects of play production: acting, directing, design.

DRAM 221 Beginning Acting (3) (AY) Concentration on individual exercises and group activities that emphasize voice, movement, and relaxation through in-class improvisation and performance of monologues and two-person scenes. Beginning play analysis.

DRAM 222 Beginning Acting II (3) (AY) Continuation of DRAM 221, with emphasis on building the ensemble, basic character work, refining vocal production, and expanding movement vocabulary. Performance of group scenes from modern and contemporary plays. Play analysis based on method acting theory. Pre: DRAM 221

DRAM 231 Oral Interpretation of Literature (3) (AY) Principles of interpretive reading. Textual analysis, training in individual and group performance techniques. Development, arrangement and performance of program. (Same as COM 231)

DRAM 270 Stage Techniques (2) (AY) Required for all Performing Arts majors. Study of the basic vocabulary of the stage and the collaborative contributions of directors, actors, technicians, and house personnel. Experiential work in the development of stage presence and etiquette. May be taken concurrently with music and dance technique courses.

DRAM 280 Basic Stagecraft (3) (S) Required of all Performing Arts majors. Introduction to beginning concepts of design and construction of scenery for the stage. Overview of the development of scenography from Greek theatre to the modern proscenium stage. Study will include two- and three-dimensional scenery, properties, and finishing techniques. To be taken concurrently with DRAM 280L.

DRAM 280L Basic Stagecraft Laboratory (1) (S) Supervised work in stagecraft, lighting, and sound. To be taken concurrently with DRAM 280.

DRAM 321 Styles of Acting (3) (Y) Advanced study for actors who have completed Beginning Acting. Concentrated scene work, script analysis, character development, and style study. Comparative exercises in acting for the stage and the camera. Performance of workshop material. Pre: DRAM 221, 222, and consent of instructor.

DRAM 322 Acting Shakespeare (3) (Y) In-depth study of Shakespearean texts from the standpoint of production and acting style. Historical

study of Renaissance production techniques. Performance of scenes resulting from work on vocal production, period movement, and text analysis.

DRAM 340 Stage Makeup (3) (Y) Studio work in design and application of stage makeup. Study and development of character, corrective, and three-dimensional makeup. Required work on major production. Pre: consent of instructor and DRAM 170 or 221 or previous stage makeup experience.

DRAM 350 Stage Costume (3) (IO) Study of costume design, theory, and practice. Survey of historical and modern costume. Practical experience in design and construction including required work on major production. Pre: DRAM 170 or 221, or consent of instructor. **Note: Students with no previous sewing experience must enroll concurrently in DRAM 350L: Stage Costume Laboratory.**

DRAM 350L Stage Costume Laboratory (1) (IO) Basic instruction in the use of sewing machines, patterns, and hand-sewing techniques for costume building. Includes understanding of fabrics and specific skills related to garment construction. Pre: Concurrent enrollment in DRAM 350 and consent of instructor.

DRAM 364 Advanced Theatre Practicum (1-4) (S) Supervised work and/or performance for the advanced student in one or more of the following areas: acting, stagecraft/construction, lighting, costuming, sound, makeup, publicity, arts administration, box office techniques. May be repeated for a total of 8 semester hours. Pre: DRAM 264 or 340 or 350 and consent of the instructor.

Hrs/wk: Lectures 2 Lab Variable*
 *Lab hours reflect variable credit(s):
 1 credit=32 lab hrs./semester
 2 credits=64 lab hrs./semester
 3 credits=96 lab hrs./semester
 4 credits=128 lab hrs./semester

DRAM 380 Theatre Design (3) (AY) Study of elements of scenic and lighting design for the stage. Production of renderings, models, elevations, and plots. Work on mainstage and/or studio production. Pre: DRAM 264, and art & physics courses required for Performing Arts degree in Technical Theatre.

DRAM 390 Survey of Drama Literature (3) (AY) Analysis and discussion of plays from the canon of Western dramatic literature, focusing on dramatic action, character relationships, play structure, staging, and thematic considerations.

DRAM 419 Drama in Education (3) (AY) Study of the theory and application of creative dramatics, developmental theatre, and curriculum-centered drama activities in educational settings serving children and youth. Opportunities for field work will be incorporated into class activities. Pre: Performing Arts core or consent of instructor.

DRAM 421 Acting Troupe (3) (AY) Rehearsal and performance of works from Western literature and ethnic non-Western sources, including period drama, avant-garde theatre, and the contemporary drama of Hawai'i and the Pacific, emphasis on ensemble performance. Refinement of individual skill and group interactions acquired in DRAM 321, 322. Public performance required. May be repeated for a total of 6 semester hours. Pre: DRAM 221, 222, 321, 322, audition, or consent of instructor.

DRAM 430 Directing (3) (IO) Basic practical course in how to direct a play. Students direct one-act plays or scenes from full length plays. Pre: DRAM 170, 221, 260, or 264, and 321, and consent of instructor.

DRAM 480 Stage Management (3) (Y) Study of the responsibilities of a production stage manager, from rehearsals through mounting a show, as coordinator of a production team. Development of the prompt book and forms needed to organize the technical elements of a production. Pre: DRAM 170, 264, and 364, and art & physics courses required for Performing Arts Degree in Technical Theatre.

DRAM 483 Contemporary Drama (3) (AY) A study of works which have established or refined major traditions in modern and contemporary theater, with some reading in critical theory. Pre: ENG 100 or 100T or ESL 100 or ESL 100T and 200-level coursework in literature. (Same as ENG 483)

DRAMA ■ COURSES

DRAM 490 Lyric Theatre (3) (IO) Extensive study of history, theory, and techniques that shaped the American Musical Theatre genre, with emphasis on major composers, choreographers, and performers. Lab work in singing, dancing, costuming, makeup, and technical requirements, leading to a final performance project. Pre: DRAM 170, 221, 321 and consent of the instructor.

DRAM 490L Lyric Theatre Lab (1) (AY) Experiential study of notable choreographers, directors, and actors through complete scenes, songs and dances that are representative of the major periods and styles within musical comedy from the 1920s to the present. Emphasizes in-class performance derived from training in voice, dance and acting.

DRAM 494 Special Topics: Lighting, Painting, Props, Sound (1) (AY) Specialized focus on one of the topic areas, to include research, design, execution for mainstage, studio, touring, or found space productions. Pre: DRAM 170, 264, and 364 and art & physics courses required for Performing Arts degree in Technical Theatre. Repeatable up to 4 credits.

DRAM 499 Directed Studies: Senior Project (3) Statement of planned reading, research, performance, and/or technical project. Can be used for senior project after permission of instructor. Pre: Senior standing.

ECONOMICS (ECON)

College of Business and Economics

ECON 100 Introduction to Economics (3) (S) Economic principles for non-majors. Emphasis on the applications of theory to problem solving. (Not more than 3 credits may be granted for completion of both ECON 100 and ECON 150 at Hawai'i Community College.)

ECON 130 Introduction to Microeconomics (3) (S) (Formerly 201) How individual prices are determined. Efficient consumer-producer decision making.

ECON 131 Introduction to Macroeconomics (3) (S) (Formerly 200) The functioning of economic systems with emphasis on the forces determining levels of, and changes in, national income, employment and the price level. Pre: ECON 130 (formerly ECON 201).

ECON 210 The Global Economy (3) (Y) An introductory course for non-majors: fundamentals of supply and demand; international trade and finance; current global economic problems such as poverty, income distribution, and pollution; dynamics of economics and politics; economic cooperation.

ECON 300 Intermediate Macroeconomic Theory (3) (Y) Determination of income, employment, price levels; fiscal and monetary policies. Pre: ECON 131.

ECON 301 Intermediate Microeconomic Theory (3) (Y) Price determination under monopoly, oligopoly, and competition. Analysis of demand and cost. Pre: ECON 130, MATH 115 or MATH 205.

ECON 302 Managerial Economics (3) (AY) Application of economic and statistical concepts for business decisions. Subjects cover projection of demand and production, case analysis, problems of forecasting, multifactors and multiproducts, technological change: capital budgeting, input-output analysis, and programming techniques. Pre: QBA 361 and ECON 130.

ECON 305 The History of Economic Thought (3) (Y) The ideas and theories of major contributors to economic thought since the mid-18th century. The development of economic thought and the interrelationships between the several branches of economic theory. Pre: ECON 130, 131.

ECON 310 Economic Development (3) (Y) Analysis of growth, structural change, development patterns, foreign investment, foreign trade, and development policies and strategies; emphasis on Far East and South Pacific Islands. Pre: ECON 130, 131.

ECON 330 The Hawaiian Economy (3) (AY) Analysis of the local and state economy in terms of structure; problems and issues as they relate to the U.S. mainland and international arena. Pre: ECON 130, 131.

ECON 340 Money and Banking (3) (S) Relation of monetary system to price level, employment and income; nature and functions of money

and banking; role of money in international trade and inflation. Pre: ECON 131.

ECON 350 Urban-Regional Economic Analysis (3) (IO) Locational analysis of economic activity. Metropolitan and regional growth and development. Pre: ECON 130, 131.

ECON 360 International Trade and Welfare (3) (Y) Theoretical analysis of international trade, current international economic problems, and trade impact on international welfare. Pre: ECON 130, 131, and ECON 301 or consent of instructor.

ECON 361 International Finance (3) (Y) Balance of payments, foreign exchange rate policies, and their impact on domestic employment, inflation, internal and external balances, and other related topics. Pre: ECON 130, 131.

ECON 370 Government Finance (3) (Y) An explicit introduction to the behavior and objectives of government in the economic system. Analysis focuses on the rationale of nonmarket institutions and on the two groups of agents that operate government, the politicians and the bureaucrats, as these agents allocate expenditures for government activities.

ECON 380 Natural Resource and Environmental Economics (3) (Y) An analytical framework for examining the relationships among environmental quality, natural resource use, and economic and political systems; analysis of circumstances that give rise to environmental problems, resource use conflicts, and possible policy solutions to these problems and conflicts. The course will emphasize issues pertaining to Hawai'i. Pre: ECON 130 and ECON 301 or consent of instructor.

ECON 381 Labor Economics (3) (AY) Labor market analysis; demand for, and supply of labor, determination of wages, trade unions and collective bargaining; Human capital investment, household production theory, mobility and migration. Specific applications to Hawai'i. Pre: ECON 130.

ECON 390 Econometrics (3) (Y) Use of mathematical and statistical techniques to model and test the reality of economic theory, tests of hypotheses and forecasting. Pre: MATH 121 or QBA 260; MATH 115 or MATH 205.

ECON 399 Directed Studies (1-3) Statement of planned reading or research required. Pre: junior standing and consent of instructor.

ECON 415 Southeast Asia-China Economic Relations (3) (Y) Analysis of Southeast Asia-China economic relations. China's role in economic development of Southeast Asian nations, the bilateral economic relations between each of the Southeast Asian countries and China, the ASEAN-China multilateral relations, and the importance of the ASEAN-China Free Trade Agreement to the future of the region and the world. Offered Fall semester.

ECON 420 Mathematical Economics (3) (IO) Equilibrium analysis, comparative-static analysis, dynamic economic analysis, unconstrained and constrained optimization, input-output analysis, linear and non-linear programming, game theory, etc. Pre: ECON 130, 131, or MATH 205 or ECON 301.

ECON 494 Special Topics in Economics (1-3) Advanced topics chosen by the instructor. The course content will vary. It may be repeated for credit, provided that a different topic is studied. Pre: ECON 130, 131. Senior standing and consent of instructor.

ECON 499 Directed Studies (1-3) Statement of planned reading or research required. Pre: senior standing and consent of instructor.

EDUCATION (ED)

College of Arts and Sciences

ED 310 Introduction to Education (3) (S) Introduction to the tasks of teaching, realities and complexities of schooling, basic educational research, and observational and conceptual tools for interpreting what goes on in classrooms. The course is designed to help students think seriously about education as a potential career and to prepare them for admission into the Teacher Education Program. Required for admission into the Teacher Education Program. Must be taken for a grade. Pre: GPA of 2.5 and junior standing or consent of instructor.

- ED 314 Educational Media & Technology (3) (S)** Introduction to theories, application of principles, acquisition of practical skills of educational media and technology relevant to teaching/learning situations, in classrooms as well as non-school settings. Special emphasis on artistic/aesthetic principles of design. Required for admission into the Teacher Education Program. Must be taken for a grade. Pre: CS 100, GPA of 2.5 and junior standing or consent of the instructor.
- ED 341 Teaching Beginning Reading, Grades K-3 (3) (S)** Basic knowledge and skills of teaching reading to developing readers including the use of a variety of reading strategies which focus on engagement in reading, oral language, early concepts of reading, word recognition and phonics, and strategic reading comprehension. Emphasis on instructional and assessment reading strategies which may be used in the K-3 classroom.
- ED 342 Science for Elementary School Teachers (3) (Y)** This course is a hands-on inquiry course designed to help the elementary teacher develop a basic understanding of the process and thinking that relate to scientific inquiry, habits of mind, safety, and science and technology in society. In a supportive classroom environment, using place-based education as a model, teacher candidates will build a scientific foundation through exploration of science concepts and processes related to the five strands in the Hawaii Content and Performance Standards III (HCPS III). Offered Spring semester only. Required for admission into the Teacher Education Program. Must be taken for a grade. Pre: CS 100, GPA of 2.5 and junior standing or consent of the instructor.
- ED 343 Math for Elementary School Teachers (3) (S)** This course is a hands-on, problem-based course designed to help the elementary teacher develop a basic understanding of the ten National Council for Teachers of Mathematics (NCTM) standards. The course includes content area skills as well as process and thinking that relate to mathematical problem-solving, reasoning, connections, communication, and representation. These areas combine to create the Mathematic Hawaii Content and Performance Standards III (HCPS III). Must be taken for a grade. Pre: CS 100, GPA of 2.5 and junior standing or consent of the instructor.
- ED 344 Social Studies for Elementary School Teachers (3) (S)** This is an inquiry based course designed to help the elementary teacher develop a basic understanding of the ten social studies themes identified by the National Council of Teachers of Social Studies. This course will include the content area skills related to the five disciplines of history, geography, economics, political science/civics, and cultural anthropology which create the Social Studies Hawaii Content and Performance Standards III (HCPS III). Required for admission into the Teacher Education Program. Must be taken for a grade. Pre: CS 100, GPA of 2.5 and junior standing or consent of the instructor.
- ED 346 Teaching Children's Literature (3) (Y)** This course focuses on children's literature and its impact on social, emotional, and intellectual development for elementary school children. Aesthetic appreciation and creative development will be explored by examining theory and practice about the use of literature with children. Offered Spring semester only. Must be taken for a grade. Pre: CS 100, GPA of 2.5 and junior standing or consent of the instructor.
- ED 350 Developmental Concepts of Learning (3) (S)** Theories of development focusing on the integration of physical, social, emotional and cognitive development during the school-aged years, children (grades K-6) and adolescents (grades 7 - 12). Systematic observation and analysis of the behavior of school-aged children at home, in the community and at school. 20 field hours in schools required. Must be taken for a grade. Pre: GPA of 2.5 and junior standing or consent of instructor.
- ED 399 Directed Studies (1-3)** Statement of planned reading or research required. Pre: junior standing and consent of instructor.
- ED 469 Principles of Instructional Planning (1) (S)** Inquiry, decision-making processes, strategies of integrated planning in learning environment, and evaluating student learning outcomes. Overview of national and state standards, materials, content and meta-curricular methodologies. Teacher candidates will design unit blueprints collaboratively as outlined in the Field Experience Handbook using content standards and representing one subject area to design the unit blueprint.
- ED 470 Diverse Learners in the Regular Classroom (3) (Y)** An examination of individual differences related to intelligence, achievement, and school success. Legal, ethical, and professional responsibilities and strategies for meeting the needs of diverse students in regular education classrooms under the Individuals with Disabilities Education Act (IDEA) and Section 504 of the Rehabilitation Act of 1973. Focus on elementary age children or adolescents. Special emphasis on integrating diverse learners including handicapped students into the regular classroom. Pre: TEP Cohort acceptance.
- ED 471 Art of Classroom Management (3) (Y)** Theoretical framework and practical strategies of planning and managing elementary or secondary learning environments. Exploration of instructional principles and theories of classroom management. Application of two- and three-dimensional media to represent self exploration and demonstrate professional reflection. Pre: TEP Cohort acceptance.
- ED 472 Elementary Integrated Math/Science Methods (4) (Y)** Exploration of mathematical and scientific concepts through national/local standards using problem solving and inquiry to develop integrated, multi-disciplinary units. Strategies of teaching math and science in grades K-6, including classroom organization, set up and safety. Pre: TEP Cohort acceptance.
- ED 473 Elementary Literacy, Language Arts and Social Studies Methods (4) (Y)** Overview of sociopsycholinguistic reading and writing processes. Emphasis on meaning-based strategies, literature-based literacy development and reading-writing connections. Exploration of the social studies strands and language, as a K-6 integrated and inter-disciplinary approach to thematic planning to enhance the study of culture while reinforcing concepts and skills in each discipline. Pre: TEP Cohort acceptance.
- ED 474 Secondary Language Arts and Social Studies Methods (4) (Y)** Methods of teaching social studies and language arts at the secondary level (grades 7-12). Integrated and inter-disciplinary approaches to enhance the study of culture while reinforcing concepts and skills in each discipline. Pre: TEP Cohort acceptance.
- ED 475 Secondary Math/Science Methods (4) (Y)** Exploration of mathematical and scientific concepts through national/local standards using problem solving and inquiry to develop integrated, multi-disciplinary units which include technology. Strategies of teaching math, science at the secondary level (grades 7-12) including classroom organization, set up and safety. Pre: TEP Cohort acceptance.
- ED 476 Literacy in the Secondary School (2) (Y)** Content area literacy, sociocultural theories and strategies to enhance students' text comprehension and study. Writing in the content areas, use of reference material, young adult literature, and non-print media in the teaching of content area concepts within and across content areas in multicultural classrooms. Pre: TEP Cohort acceptance.
- ED 477 Art Education Methods (1) (Y)** Scope and organization of art in the elementary school curriculum, creative use of art media through lab experiences. The integration of art across content areas through the application of two- and three-dimensional media. Pre: TEP Cohort acceptance.
- ED 478 Issues in Assessment & Evaluation in Secondary Schools (2) (Y)** Theory and techniques of measurement and evaluation in secondary education, including supervised experience in authentic/performance based assessment, traditional instrument development and analysis, grading and reporting results. Pre: TEP Cohort acceptance.
- ED 479 Field Experience I (2) (Y)** Practical application of theories and teaching methods and strategies in local schools. Supervised observation and teaching with an emphasis on lesson and unit planning and instruction. Offered on a CR/NC basis. Pre: TEP Cohort acceptance.
- ED 483 Seminar in Teaching I (1) (Y)** Professional development through discussion of educational issues and applications of theories and teaching methods through field experiences in local schools. Offered on CR/NC basis. Pre: TEP Cohort acceptance.
- ED 484 Effective Teaching Portfolio (1) (Y)** The integration of art, media, and technology in the preparation of an effective teaching portfolio. Offered on CR/NC basis. Pre: TEP Cohort acceptance.

ED 485 Seminar in Teaching II (3) (Y) Analysis and discussion of common management and instructional concerns of beginning teachers by student teachers and their supervisors. Individual identification and analysis of teaching problems. Offered on CR/NC basis. Pre: TEP Cohort acceptance.

ED 486 Field Experience II (10) (Y) Supervised student teaching and professional development experiences in local schools. Supervised observation and teaching with an emphasis on advanced lesson and unit planning. Offered on CR/NC basis. Pre: TEP Cohort acceptance.

ECON 494 Special Topics in Economics (1-3) Advanced topics chosen by the instructor. The course content will vary. It may be repeated for credit, provided that a different topic is studied. Pre: ECON 130, 131, or consent of instructor.

ED 499 Directed Studies (1-3) (S) Statement of planned reading or research required. Pre: senior standing and consent of instructor.

ENGINEERING (CE and EE)

College of Arts and Sciences, Pre-Engineering Program CIVIL ENGINEERING (CE)

CE 270 Applied Mechanics I (3) (Y) Equilibrium of particles, rigid bodies, frames and machines; vectors, centroids, friction, and moments of inertia. Pre: PHYS 170, 170L and MATH 206. Offered in Fall semester only.

CE 271 Applied Mechanics II (3) (Y) Dynamics of particles and rigid bodies; force-acceleration; impulse-momentum; work-energy. Pre: CE 270 and MATH 231. Offered in Spring semester only.

ELECTRICAL ENGINEERING (EE)

EE 211 Basic Circuit Analysis (3 lec, 1 lab) (Y) Linear circuits, time-domain analysis, transient and steady-state responses, phasors, impedance and admittance; network or system functions, frequency response and filtering, resonance. Pre: MATH 206. Offered in Spring semester only.

ENGLISH (ENG)

College of Arts and Sciences

ENG 100 Expository Writing (3) (S) Instruction and practice in writing clear, effective university-level essays and research paper. Attention to all stages of the process-generating ideas, drafting, revising, and editing. Entry requirements: ENG 100 recommendation on Writing Placement Examination.

ENG 100T Expository Writing with Tutorial Assistance (3) (S) Instruction and practice in writing clear, effective university-level essays and research paper. Attention to all stages of the process generating ideas, drafting, revising, and editing. Attending regular sessions is required. Equivalent to ENG 100 or ESL 100. Entry requirements: ENG 100T recommendation on Writing Placement Examination.

ESL 100 Expository Writing for Non-Native Speakers (3) (S) Instruction and practice in writing clear, effective university-level essays and research paper. Fulfills the Expository Writing (ENG 100) requirement for non-native speakers of English only. Entry requirements: ESL 100 recommendation on Writing Placement Examination and completion, exit by test, or concurrent enrollment in ESL 083. Once enrolled concurrently in ESL 100, a student may NOT drop the required ESL 083 class without dropping ESL 100 as well.

ESL 100T Expository Writing for Non-Native Speakers with Tutorial Assistance (3) (S) Instruction and practice in writing clear, effective university-level essays and research paper. Fulfills the Expository Writing (ENG 100) requirement for non-native speakers of English only. Entry requirements: ESL 100T recommendation on Writing Placement Examination and completion, exit by test, or concurrent enrollment in ESL 083. Once enrolled concurrently in ESL 100T, a student may NOT drop the required ESL 083 class without dropping ESL 100T as well.

ENG 199 Directed Studies (1-3) Permission of instructor and statement of planned reading or research required. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T

ENG 200 Introduction to Genre (3) An introduction to major genres in English literature. This class focuses on prose, poetry, and drama via a range of older and more recent works from a variety of backgrounds. Emphasis on reading, writing, and discussion. Pre: C or higher in ENG 100, 100T, ESL 100 or ESL 100T.

ENG 209 Writing for Business (3) (S) Working from logical and rhetorical principles, this course prepares students to write in the informative, analytical, and persuasive modes required for their major field and in their careers. Intended for students majoring in Business and related fields. Includes a formal research project and report. Pre: C or higher in ENG 100T, 100, or ESL 100, 100T.

ENG 215 Writing for Humanities and Social Sciences (3) (S) Develops research skills and further prepares students to do types of source-based writing commonly expected in the humanities and social sciences. Emphasis on writing from logical and rhetorical principles, especially assertion, analysis, and evaluation. Pre: C or higher in ENG 100T, 100, or ESL 100, 100T.

ENG 225 Writing for Science and Technology (3) (S) Working from logical and rhetorical principles, this course prepares students to write about science and technology in their academic disciplines and careers. Assignments include synthesis, process analysis, and argumentation. Intended for students majoring in the applied and natural sciences. Includes a formal research project and report. Pre: C or higher in ENG 100 or ENG 100T, or ESL 100, or ESL 100T.

ENG 251, 252 Major Works of British Literature (3-3) Yr. (Y) 251: Middle Ages to 1800; 252: 1800 to the present. Pre: ENG 100, 100T, ESL 100 or ESL 100T or consent of instructor.

ENG 253, 254 World Literature (3-3) Yr. (AY) Major works in translation. 253: Classical to 17th century; 254: 17th century to the present. Pre: Pre: ENG 100, 100T, ESL 100 or ESL 100T or consent of instructor.

ENG 275 Literature of the Earth (3) (Y) This course studies how people from a variety of eras and cultures have shaped their poetry, fiction, drama, and essays to respond to changes in the natural world. This class will examine issues of globalization and environmental sustainability, with opportunities for research on connections between local and global environmental problems. Pre: ENG 100, 100T, ESL 100 or ESL 100T.

ENG 285 Introduction to News Writing and Reporting (3) (Y) Prepares students to write for newspapers, the Internet, and other journalistic outlets. Includes coverage of news conferences, county council meetings, trials, sports, and writing feature stories. (Same as COM 285)

ENG 286 Introduction to Creative Writing (3) (Y) An introduction to the theoretical, practical, and artistic concerns of writing vivid and compelling prose fiction, poetry, and creative non-fiction. Students will be exposed to a range of critical and primary creative writing texts as they produce their own works in each genre. Pre: C or higher in ENG 100, 100T, ESL 100 or ESL 100T. Offered Fall Semester only.

ENG 287 Introduction to Rhetoric (3) (Y) Survey of rhetorical history, studies and practices from Classical to Contemporary. Discussion of social, political, legal, and ethical aspects of rhetoric and rhetorical theory. Pre: C or higher in ENG 100, 100T, ESL 100 or ESL 100T. Offered Fall semester only.

ENG 294 Special Topics in English (1-3) (Y) Advanced topics chosen by the instructor. The course content will vary. Course may be repeated for credit, provided a different topic is studied. Pre: C or better in ENG 100, 100T, ESL 100 or ESL 100T or consent of the instructor.

ENG 299 Directed Studies (1-3) Permission of instructor and statement of planned reading or research required. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T or consent of instructor.

ENG 300 Introduction to Literary Studies (3) (Y) Introduces majors to the methods of research, analysis, close reading and argumentation that are essential to the successful reading of and writing about literature. Included is a comprehensive survey of literary terms, key concepts, literary forms and genres. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T and ENG 251 or 252 or 253 or 254, or consent of instructor.

ENG 301 The Bible as Literature (3) (IO) Selected books of the Old and the New Testaments, examined with respect to their composition,

- form, and literary merit. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T and 200 level literature course or consent of instructor.
- ENG 303 Backgrounds to English Studies (3) (Y)** Comparative in focus, extending student's knowledge of literary works that have influenced literature in English. It is intended to educate students in the similarities and differences in literatures of various times and cultures, and to discern the common themes that are present in many literatures. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T
- ENG 315 Advanced Composition (3) (S)** Writing of essays with an emphasis on rhetorical and stylistic methods, structure, and voice. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T and one of the following: ENG 209, 215, 225, or 287.
- ENG 318 Playwriting (3) (IO)** Writing one-act plays for the stage and for radio. Examining and applying the requirements and uniqueness of writing for the stage play and for the radio-drama. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T.
- ENG 320 History of the English Language (3) (AY)** The major developments in the English language from the 5th century to the present day. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T, LING 102 or LING 121, or consent of instructor.
- ENG 321 Morphology and Syntax (3) (IO)** Introduction to grammatical analysis and theory; practical experience in solving problems in morphology and syntax, using data drawn from a wide variety of languages. Pre: LING 102 or consent of instructor. (Same as ANTH 321, LING 321)
- ENG 323 The Literature of Hawai'i (3) (Y)** A critical analysis of the history of literature in the Hawaiian Islands. Study will touch upon the politicization of the Hawaiian language, the insider/outsider debate, the emergence of local literature, and ethnic/racial divides in contemporary discussions of literary craft and study. Class will include oral narratives (chants, hula), expatriate literature (Bingham, London, Michener), and a wide range of local texts. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T or consent of instructor. A 200-level English literature class is recommended.
- ENG 324 Modern English Grammar and Usage (3) (IO)** The fundamentals of English morphology and syntax, conventions of written and spoken English, and sociolinguistic aspects of major English registers and dialects. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T, LING 102 or LING 121, or consent of instructor.
- ENG 344 Children and Language (3) (AY)** Strategies of language acquisition used by children; emphasis on investigative skills and methods, including some field work. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T or consent of instructor. Recommended prerequisite: ANTH/LING 121 or ENG/LING 203.
- ENG 345 Children and Literature (3) (AY)** Literature in English for and by children, with special emphasis on the ways in which literature promotes social, emotional, and intellectual development. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T or consent of instructor.
- ENG 347 Pidgins and Creoles (3) (Y)** A study of the world's pidgins and creoles with special reference to the Pacific region; the origin and nature of pidgins and creoles; the relationship between Hawai'i Creole English to other creoles in the world. The link between the development of a creole and language acquisition. (Same as ANTH 347; recommended LING 102 or 121)
- ENG 349 Instruction and Practicum in Tutoring Writing (3) (Y)** This course introduces students to various theories about the role of The Writing Center, the tutor, and the ethical and professional responsibilities of tutoring. The practicum provides students an opportunity to tutor in the UH Hilo Writing Center under the supervision of the Center's director. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T and one 200-level writing course. Course offered only in Fall semester.
- ENG 350 Second Language Acquisition Theory (3) (Y)** Current research and theories of learning a second or additional language from social, psychological and linguistic perspectives. Topics include the attainment of communicative competence, the critical period hypothesis, focus on form, individual learning styles, and learner autonomy. The emphasis is on how the knowledge of second language acquisition theory helps improve the quality of classroom language teaching. Pre: LING 102 or consent of instructor.
- ENG 351, 352 Survey of American Literature (3-3) Yr. (Y)** 351: American literature to the Civil War; 352: from the Civil War to the present. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T and 200-level literature course or consent of instructor.
- ENG 355 Women in Modern Literature and Film (3) (AY)** Literature and film by and about women from 1900 to the present Feminist literary theory. Pre: ENG 100/ESL 100 and 200-level literature course or college-level Women's Studies course or consent of instructor. (Same as WS 355)
- ENG 356 Language and Gender (3) (AY)** Students engage in the analysis of gender as it relates to language and society. Provides students with analytic resources for thinking critically about the relationship between language and social practice. Students gather and analyze data based on current theories. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T and LING 102 or consent of instructor. (Same as WS 356)
- ENG 365 Japanese Literature in English (3) (AY)** Survey of major works from earliest times to the present. Knowledge of Japanese is not required. (Same as JPST 365)
- ENG 371 Topics in Contemporary Literature (3) (AY)** The development of contemporary fiction, poetry and drama concentrating upon representative works from 1945 to the present. This course may be taken twice provided that different topics are studied. The letter suffix indicates the topic. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T and one college-level literature course or consent of the instructor.
- ENG 387 Literature of the Environment (3) (Y)** A study of modern nature writing and environmental issues in several genres. Students will explore how humans negotiate their place in a variety of physical environments. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T and a 200-level college literature course, or consent of instructor. (Same as GEOG 387)
- ENG 394 Special Topics in English (1-3) (Y)** Advanced topics chosen by the instructor. The course content will vary. Course may be repeated for credit, provided that a different topic is studied. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T and 200-level literature course or consent of instructor.
- ENG 399 Directed Studies (1-3)** Statement of planned reading or research required. Pre: junior standing; Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T and 200-level literature course or consent of instructor.
- ENG 422 ESL Teaching Practicum (3) (Y)** A course requiring students to engage in supervised teaching in an authentic classroom setting with actual learners of ESL. Provides the student with opportunities to observe, describe, interpret, and understand the classroom environment and to reflect on the personal and professional attributes required for success in teaching. Students design and implement their own lesson plans and also analyze and reflect on the classroom environment in relation to current research. Pre: LING 102, 121 or 331, ENG or LING 324, 350, ENG 484.
- ENG 423 Post-Colonial Literature (3) (AY)** A critical analysis of the development of contemporary world literature in the wake of the fall of European empires. This class is designed to address the importance of writing in an age of changing national identities, shifting alliances, and volatile conflicts. Texts from Africa, Latin America, the Middle East, the Caribbean, and Hawai'i will be featured. Pre: ENG 100 or ESL 100 or ENG 100T or ESL 100T and 200-level English literature class or consent of instructor.
- ENG 430 Pacific Islands Literature (3) (AY)** A study of a representative range of contemporary poems, short stories, novels, and plays written in English by Pacific Islanders from Polynesia, Micronesia, and Melanesia. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T and 200-level literature course or consent of instructor.
- ENG 431 Fiction Writing (3) (Y)** Advanced study and writing seminar in fiction. Students may repeat for credit (maximum 6 credits). Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T and college-level literature course and ENG 315, or consent of instructor. Offered Spring semester only.

- ENG 432 Non-Fiction Writing (3) (Y)** Advanced study and writing seminar in non-fiction. Students may repeat for credit (maximum 6 credits). Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T and college-level literature course and ENG 315, or consent of instructor. Offered Fall semester only.
- ENG 433 Poetry Writing (3) (Y)** Advanced study and writing seminar in poetry. Students may repeat for credit (maximum 6 credits). Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T and college-level literature course and ENG 315, or consent of instructor. Offered Spring semester only.
- ENG 435 Chaucer (3) (AY)** The works of Chaucer. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T and 200-level literature course or consent of instructor.
- ENG 437 Renaissance Poetry and Prose (3) (AY)** Poetry and prose of the period 1500-1660, exclusive of Milton. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T and 200-level literature course or consent of instructor.
- ENG 438 Milton (3) (AY)** Selected poetry and prose, including *Areopagitica*, *Paradise Lost*, *Paradise Regained* and *Samson Agonistes*. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T or consent of instructor.
- ENG 440 Restoration and Eighteenth Century Literature (3) (AY)** Poetry and prose of the Restoration and the 18th century. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T or consent of instructor.
- ENG 442 Romantic Literature (3) (Y)** Poetry and prose from 1780 to 1832. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T and 200-level literature course or consent of instructor.
- ENG 445 Victorian Literature (3) (Y)** Poetry and prose from 1832 to 1900. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T and 200-level literature course or consent of instructor.
- ENG 459 Medieval Literature (3) (AY)** Early English poetry and prose, with an emphasis on Anglo-Saxon literature, medieval an dramatic poetry, and the works of Sir Thomas Malory. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T and 200-level literature course or consent of instructor.
- ENG 460 Renaissance Drama (3) (AY)** The contemporaries and successors of Shakespeare, with particular emphasis on the plays of Jonson, Beaumont & Fletcher, Webster, and Tourneur. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T and 200-level literature course or consent of instructor.
- ENG 461 Shakespeare (3) (AY)** Selected histories, comedies, and tragedies not studied in ENG 462. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T and 200-level literature course or consent of instructor.
- ENG 462 Shakespeare II (3) (AY)** The study of selected histories, comedies, and tragedies, with emphasis on performance choices as they determine and determined by varying interpretations. Most plays studied in ENG 462 will differ from those studied in ENG 461. When the approach is different in the two courses, a play may be studied in both. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T and any college-level literature or drama class or consent of instructor.
- ENG 464 Modern Literature (3) (AY)** British and American literature from 1900 to WWII with emphasis on the development of Literary Modernism. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T and at least one college-level literature course or consent of instructor.
- ENG 475 Theoretical and Practical Criticism (3) (AY)** Analysis of historical and contemporary literary theories accompanied by theory and practical criticism of selected literary works. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T and 200-level literature course or consent of instructor.
- ENG 480 Women and Rhetoric (3) (AY)** Survey of key female figures that have figured (or not figured) into the rhetorical canon. Analysis of women's used of rhetoric in everyday life and at historic moments and consideration of methodological and theoretical issues intersecting women, rhetoric, and historical research. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T and ENG 287 or 315 or consent of instructor. (Same as WS 480).
- ENG 482 Teaching Composition (3) (AY)** Overview of current theory and research informing contemporary English composition instruction at elementary, secondary, and college levels with methods for application to teaching of writing at any level or within any discipline. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T and ENG 209 and ENG 315 or consent of instructor.
- ENG 483 Modern/Contemporary Drama (3) (AY)** A study of works which have established or refined major traditions in modern and contemporary theater, with some reading in critical theory. Pre: ENG 100 or 100T or ESL 100 or ESL 100T and 200-level coursework in literature. (Same as DRAM 483)
- ENG 484 ESL Materials and Methods (3) (IO)** Overview of current theory and practice in the teaching of English as a Second Language. In addition to studying and evaluating various theoretical approaches to ESL teaching and second-language learning, students will gain experience developing and using their own teaching materials. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T and ENG/LING 350.
- ENG 485 World Wide Web Writing: Praxis (3) (AY)** Introduction and practice in concepts of writing for the World Wide Web, including document design, web publishing, designing, and evaluating web documents. Hands-on HTML, XHTML, and how to build, launch, and maintain a web page for non-computer science students. Pre: Eng100/ESL 100 and a 200- or 300-level writing course, or consent of instructor.
- ENG 486 Applied Professional Writing (3) (Y)** Preparation and practice in professional writing in real work settings. Includes planning, executing, and analyzing a writing project in the community. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T and ENG 209 or consent of instructor.
- ENG 487 Technical Writing (3) (IO)** Advanced writing for engineering, science, and technology. Topics covered include analysis of and practice in planning, preparing, and critiquing technical reports, proposals, instructions, and correspondence. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T and ENG 209 or consent of instructor.
- ENG 488 Single Author (3) (AY)** A semester-long consideration of the literary output of a single author selected by the instructor. May be repeated for credit provided that a different topic is studied. Credit may be earned in each different period: (A) Pre-1700; (B) Post-1700. Pre: ENG 100 or ENG 100T or ESL 100 or ESL 100T, 251 or 252 or 253 or 254, ENG 300 or consent of instructor.
- ENG 490 World Wide Web Writing: Theory and Rhetoric (3) (AY)** Considers composition and rhetoric in relation with technology and the Internet. Discussion of social, political, legal, and ethical aspects of writing for the World Wide Web. Focus on theory and rhetoric. Pre: ENG 315 and a 200- or 300-level writing course, or consent of instructor.
- ENG 494 Special Topics in English (1-3) (Y)** Advanced topics chosen by the instructor. The course content will vary. It may be repeated for credit, provided that a different topic is studied. Pre: senior standing; ENG 100 or ENG 100T or ESL 100 or ESL 100T and 200-level literature course or consent of instructor.
- ENG 499 Directed Studies (1-3)** Statement of planned reading or research required. Pre: senior standing; ENG 100 or ENG 100T or ESL 100 or ESL 100T and 200-level literature course or consent of instructor.

ENGLISH AS A SECOND LANGUAGE (ESL)

English Language Institute (ELI), College of Continuing Education and Community Service

- ELI courses, while carrying administrative credit, do not count toward graduation from UH Hilo. For tuition and immigration purposes, the courses count as three semester credit hours each.
- ESL 061 Listening and Speaking in English (0) (S)** Practice in listening comprehension, conversational skills, discussion skills, and understanding cultural differences. Includes language lab. Entry requirement: ESL 061 placement in English Proficiency Test. **This course does not count towards graduation from UH Hilo.**
- ESL 062 Essentials of English Grammar (0) (S)** Intensive drill in and contextual practice of the rules of noun and verb forms and usage in English, and in connectives and other function forms. Entry require-

ment: ESL 062 placement in English Proficiency Test. **This course does not count towards graduation from UH Hilo.**

ESL 063 Basics of Reading in English (0) (S) Preparation for college-level reading with work in vocabulary, understanding complex sentence structures, reading strategies, and relation of writing to reading. Includes self-paced reading lab. Entry requirement: ESL 063 placement in English Proficiency Test. **This course does not count towards graduation from UH Hilo.**

ESL 064 Preparation for English Composition (0) (S) Preparation for college-level writing with work in vocabulary, sentence structure, and the development and reinforcement of paragraph skills. Entry requirement: 064 placement in the English Proficiency Test and Writing Placement Exam. **This course does not count towards graduation from UH Hilo.**

ESL 071 Basic Communication Skills (0) (S) Designed for non-native speakers to improve listening, thinking, and communicating ideas in English. Native-speaker lectures and speech practice accelerate the learning skills needed for college work. Includes language lab. Entry requirement: ESL 071 placement in the English Proficiency Test or successful completion of ESL 061. **This course does not count towards graduation from UH Hilo.**

ESL 072 Basics of English Grammar (0) (S) Introduction and the practice of English grammar. Emphasis on accurate use of basic structures in both speaking and writing. Entry requirement: ESL 072 placement in English Proficiency Test or successful completion of ESL 062. **This course does not count towards graduation from UH Hilo.**

ESL 073 English Reading Skills (0) (S) Designed for non-native English speakers to build and acquire academic reading skills. Focus is on increasing reading speed, building vocabulary, previewing and predicting, skimming and scanning, and finding main ideas and details. The course also includes work in a self-paced reading lab. Entry requirement: ESL 073 placement in the English Proficiency Test or successful completion of ESL 063. **This course does not count towards graduation from UHH.**

ESL 074 Introduction to Composition (0) (S) Introduction and practice in writing coherent, well-organized paragraphs as well as multi-paragraph essays in a variety of rhetorical styles. Entry requirement: ESL 074 placement in English Proficiency Test and Writing Placement Exam or successful completion of ESL 064. **This course does not count towards graduation from UH Hilo.**

ESL 081 Academic Communication Skills (0) (S) Designed for non-native English speakers to practice listening, thinking, and communicating ideas in English requisite for college study. Authentic lectures and formal speech practice expose students to the language used and required in academic coursework. Includes language lab. Entry Requirement: ESL 081 placement in English Proficiency Test or successful completion of ESL 071. **This course does not count towards graduation from UH Hilo.**

ESL 082 Intermediate English Grammar (0) (S) An overview of advanced grammatical structures that are used in college-level speaking and writing. One-third of the class is a writing lab. The lab will focus on identifying grammar problems and developing editing skills for academic writing. Entry requirements: ESL 082 placement in English Proficiency Test or successful completion of ESL 072. **This course does not count towards graduation from UH Hilo.**

ESL 083 Introduction to Academic Reading (0) (S) A course for non-native speakers of English using authentic texts and selected fiction which is designed to develop reading skills necessary for college-level work. Emphasis on vocabulary development, finding main ideas and specific details, and drawing inferences. Training and practice in developing increased reading rates. Includes work in a self-paced reading lab. Entry requirements: ESL 083 placement in English Proficiency Test or successful completion of ESL 073. **This course does not count towards graduation from UH Hilo.**

ESL 084 Intermediate Composition (0) (S) Introduction and practice in writing expository essays. Attention to various stages of the writing process: generating ideas, drafting, peer review, and revision. Special emphasis on identification and editing of grammatical errors. Entry requirement: ESL 084 placement in English Proficiency Test and Writ-

ing Placement Exam or successful completion of ESL 074. **This course does not count towards graduation from UH Hilo.**

ENTOMOLOGY (ENTO)

College of Agriculture, Forestry and Natural Resource Management

ENTO 262 Introductory Beekeeping (2 lec., 1 lab) (3) (Y) Biology, behavior, and management of honeybees for honey production. Limited enrollment. Consent of instructor.

ENTO 304 General Entomology (2 lec., 1 lab) (3) (S) Structure, classification and identification of insects. Pre: BIOL 175 or 176 or consent of instructor. (Same as BIOL 205)

ENTO 350 Advanced Beekeeping (2 lec., 1 lab) (3) (Y) Advanced beekeeping practices designed to improve hive quality such as queen rearing, artificial insemination, and requeening as well as the utilization of products from the hive. Limited enrollment. Pre: ENTO 262 or consent of instructor.

ENTO 361 Insect Morphology (2 lec., 1 lab) (3) (IO) Comparative and gross morphology; homologies of structure; anatomy; development in representative groups. Pre: ENTO 304 or consent of instructor.

ENTO 374 Insect Pest Control (2 lec., 1 lab) (3) (Y) Destructive and beneficial insects; principles of cultural, mechanical, legislative, biological, and chemical control. Pre: ENTO 304 or consent of instructor.

ENVIRONMENTAL STUDIES/SCIENCE (ENSC)

College of Arts and Sciences

ENSC 100 Introduction to Environmental Science (3) (Y) An introductory course linking the human and physical/chemical/biological world. Emphasis on current global and local issues related to pollution, biodiversity, ecosystem services, climate change, resource consumption, and sustainability. Focus on critical thinking and the integration of both natural and social science perspectives in understanding and addressing environmental issues. Fall semester only.

ENSC 385 Field Methods in Geography and Environmental Science (3) (Y) Geographic field methods for assessment and monitoring of the physical/biological/anthropogenic environment. Instrumentation, data collection, and analysis; planning and land management applications. Pre: GEOG 201 or consent of instructor. (Same as GEOG 385).

ENSC 441 Environmental Impact Assessment (3) (Y) Introduction to the theory and methods of environmental impact assessment (EIA). Emphasis on the biophysical, cultural, social, economic, and legal foundations of the federal and state EIA process as well as strategies to mitigate the negative environmental impact of development. Students engage in critical evaluation and preparation of an EIA. Pre: Junior or senior standing or consent of instructor. (Same as GEOG 441). Fall semester only.

ENSC 495 Senior Seminar: Environmental Science (3) (Y) Capstone course for Environmental Studies/Science Major integrating previous coursework into a disciplinary framework. Seminar focus is on research in, writing about, and discussion of themes in contemporary environmental problems. Each student will choose an environmental sub-field of interest and prepare two seminar papers: (1) survey of historical development of sub-field including theoretical and cutting-edge issues and (2) identify and investigate an original research problem in the chosen sub-field. (Same as GEOG 495). Spring semester only.

FINANCE (FIN)

College of Business and Economics

FIN 320 Principles of Business Finance (3) (S) Introduction to concepts and techniques of business finance. Topics include organizational forms, agency relationships, financial analysis and planning, the capital formation process and capital markets, risk and return, time value of money, stock and bond valuation, and capital budgeting. Pre: Admission to Professional Business Program, ACC 250 and MATH course numbered 104F, 115, 205, or higher.

FIN 321 Investment and Security Analysis (3) (Y) Fundamentals of the securities market; development of skills needed to analyze current

portfolios and potential investments. Topics include risk reduction, investment analysis, security valuation, portfolio management and option/futures speculation. Pre: Admission to Professional Business Program, FIN 320 and junior standing.

FIN 322 Corporate Finance (3) (Y) Development of tools to help managers analyze and solve financial problems. Topics include capital budgeting, capital structure, dividend policy, lease financing, short and long term asset and liability management, options and futures contracts, merger / take-over analysis and bankruptcy analysis. Pre: Admission to Professional Business Program, FIN 320, ACC 251.

FIN 325 Small Business Finance (3) (Y) Application of financial principles to small business firms; Topics include planning, valuation, investment decision making (fixed and working capital investments) and procurement of funds. Pre: Admission to Professional Business Program, FIN 320 and junior standing.

FIN 370 Principles of Real Estate (3) (AY) Real estate principles including legal, physical, and economic elements, as well as concepts of valuation, market analysis, and finance. Examined are public and private externalities affecting the allocation and utilization of real estate resources. Pre: Admission to Professional Business Program, FIN 320 and junior standing.

FIN 399 Directed Studies (1-3) Statement of planned reading or research required. Pre: Admission to Professional Business Program, junior standing and consent of instructor.

FIN 494 Special Topics in Finance (1-3) Advanced topics chosen by the instructor. The course content will vary. It may be repeated for credit, provided that a different topic is studied. Pre: Admission to Professional Business Program, varies with topic.

FIN 499 Directed Studies (1-3) Statement of planned reading or research required. Pre: Admission to Professional Business Program, senior standing and consent of instructor.

FORESTRY (FOR)

College of Agriculture, Forestry and Natural Resource Management

FOR 202 Forestry and Natural Resources (2 lec., 1 lab) (3) (Y) Development of forestry and agroforestry, forest biology, soils, ecology, conservation, management, and products. Field trips to various forestry operations.

FOR 301 Forest Mensuration (2 lec., 1 lab) (3) (Y) Practical techniques in mapping and measuring forest land and the inventory of forest resources. Principles of log, tree, stand, and growth measurements; instrumentation and simulation models.

FOR 340 Remote Sensing and GIS in Forestry (3) (Y) Application of remote sensing and GIS to Forestry. Spatial data structure, map projection, global positioning system. How to create spatial datasets through GPS survey. Utilization of GIS software and performance of basic spatial analyses. Offered Spring semester.

FOR 350 Tropical Silviculture (2 lec., 1 lab) (3) (Y) Sustainable methods and techniques for manipulation of tropical forest ecosystems to meet management objective, artificial and natural regeneration, site preparation and harvest methods, soil and water resources management, silviculture and the gene pool, intermediate stand tending and maintenance of forest health.

FOR 410 Physiological Ecology of Tropical Forests (2 lec., 1 lab) (3) (Y) Chemical, physical, and physiological processes that determine how tropical trees and forests function; emphasis on carbon, nitrogen, and phosphorus budgets; productivity, consequences of forest management, and global climate change.

FRENCH (FR)

College of Arts and Sciences, Languages

Students who have demonstrated competence in French in high school will not be admitted to FR 101 and must take a placement test before enrolling in a course in French.

FR 101-102 Elementary French (4-4) Yr. (Y) Conversation, laboratory

drill, grammar, reading, using film strips, interactive software, slides and tapes.

FR 111 Traveling in France and Western Europe (3) (Y) Introduction of basic culture, civilization and language survival skills for travel in France and the neighboring countries of Western Europe to minimize travel difficulties and to learn more about area to be visited.

FR 111L Traveling in France and Western Europe (1) (Y) Studies of oral communication in French using CD-ROM, tapes, videos and classroom conversation to prepare students to benefit from travel in France. Pre: FR 101 or permission of the instructor. (Must be taken with FR 111)

FR 150 Basic Conversational French (3) (Y) Basic conversation vocabulary and structure enabling students to express themselves in French. Emphasis will be on pronunciation, grammar and vocabulary skills in the context of everyday situations. Offered only in the Summer session.

FR 201-202 Intermediate French (4) Yr. (Y) Reading, conversation, laboratory drill, composition, using film strips, interactive software, slides and tapes. Pre: FR 102 or equivalent.

FR 299 Directed Studies (1-3) (S) Permission of the instructor and statement of planned reading or research required.

FR 311-312 Advanced Conversation and Composition (3-3) Yr. (IO) Major emphasis on strengthening oral and written language skills through reading and discussion of current French-language periodicals, writing informal essays, grammar review, and laboratory drills. Video tapes, movies, interactive software, and film strips also will be used. Pre: FR 202 or equivalent.

FR 394 Special Topics in French (3) (IO) Advanced topics chosen by instructor. Course content will vary. May be repeated for credit, provided that a different topic is studied. Pre: FR 102 or equivalent.

FR 399 Directed Studies (1-3) (S) Permission of the instructor and statement of planned reading or research required. Pre: junior standing.

FR 499 Directed Studies (1-3) (S) Permission of the instructor and statement of planned reading or research required. Pre: senior standing.

GEOGRAPHY (GEOG)

College of Arts and Sciences

GEOG 101 Geography and the Natural Environment (3)* (S) Survey of the earth's physical environment, including distribution and associations between energy, climate, vegetation, and landforms. Human interrelationships with the physical landscape.

GEOG 101L Geography and the Natural Environment Lab (2 Hrs) (1)* (IO) Analysis of the natural environment through the use of maps, airphotos, field and laboratory observation and experimentation. Emphasis on Hawai'i and upon human modification of the environment. Pre: credit or concurrent enrollment in GEOG 101.

GEOG 102 Geography of World Regions (3) (S) Geographic survey of the world's major cultural regions. Processes of spatial integration and differentiation of economic, geo-political, and cultural landscapes. Natural resource distribution and the contrasts and linkages between the developed and under-developed world.

GEOG 103 Geography and Contemporary Society (3) (S) Examines aspects of culture such as population, agriculture, industry, and religion. Focus on the relationships between people and their environment and resulting regional contrasts.

GEOG 105 Geography of the United States (3) (Y) Major features of the United States. Emphasis on what gives character or distinctiveness to various places.

GEOG 120 Weather and Climate of Hawai'i (3)* (IO) For non-science majors and prospective science teachers. Basic meteorology, sun-earth-ocean-atmosphere interrelationships, weather types, seasonal changes, trade winds, clouds, rainfall, with examples drawn from the local weather and climate. (Same as PHYS 120)

GEOG 201 Interpretation of Geographic Data (3) (Y) Introduction to methods of analysis and display of a variety of geographical data.

- Introduction to geographical research design, common statistical and graphical methods, basic computer programs, concepts of computer cartography, map interpretation and design, and more advanced techniques including GIS, GPS, and remote sensing.
- GEOG 300 Climatology (3)* (AY)** Elements and controls of climate. Dynamic processes of atmospheric circulation: the distribution patterns of solar radiation, temperature, precipitation, and evaporation. Energy and water balance concepts, climate classification. Pre: GEOG 101 or consent of instructor.
- GEOG 309 Biogeography (3)* (AY)** Basic evolutionary and ecological principles underlying the dynamics of plant and animal populations. Mechanisms of isolation, speciation, dispersal, migration, and competition as they affect past and present world distribution patterns. Island biogeography. Pre: GEOG 101; BIOL 101 or 175 or 176; or consent of instructor. (Same as BIOL 309)
- GEOG 312 Food and Societies (3)* (Y)** Different types of food production and consumption systems, and the cultural and environmental constraints operating to produce the resultant patterns. Globalization of agricultural production and consumption. Pre: one introductory Geography course. (Same as AG 312)
- GEOG 319 Natural Hazards and Disasters (3)* (AY)** Survey of origins, processes, distributions, and effects of hazardous physical forces: hurricanes, tornadoes, drought, floods, earthquakes, volcanism, landslides, erosion, and beach degradation. Hazard perception and adjustment by humans also considered. Pre: GEOG 101 or consent of instructor.
- GEOG 320 Earth Surface Processes (3)* (AY)** Processes of landform development at large and small scales. Theoretical and applied aspects, including human environment considerations. Field excursions may be required. Pre: GEOG 101 or GEOL 111 or equivalent. (Same as GEOL 342)
- GEOG 321 Geography of Economic Activity (3)* (Y)** Factors influencing the distribution of economic activities at different spatial scales: world, national, local. Consideration of general theories of decision making for urban and industrial locations. Pre: GEOG 103.
- GEOG 326 Natural Resources (3)* (AY)** Philosophy and history of the conservation movement in the United States. Ecological considerations in the management of renewable and nonrenewable resources. Current conservation issues in Hawai'i. Pre: GEOG 101 or consent of instructor.
- GEOG 328 Cultural Geography (3)* (Y)** Key concepts in cultural geography and introduction to qualitative research methods in geography. Topics include: histories of cultural geography; landscapes; nature-society relations; critical cultural geographies. Pre: one introductory Geography course.
- GEOG 329 Development Geographies (3) (Y)** Major theoretical approaches to economic development will be examined. The environmental and cultural sustainability of these approaches along with emerging alternative development (green) perspectives will be highlighted through specific case studies. Pre: Any introductory course in geography, anthropology, economics, biology, or agriculture. Offered Fall semester only.
- GEOG 331 Tourism Geographies (3) (Y)** Survey of tourism geographies, addressing a wide range of topics: tourism representations, tourism development strategies, indigenous tourism development, planning for "sustainable" tourism, and tourism's environmental impact. Pre: Junior or Senior standing or consent of instructor. Offered Fall semester only.
- GEOG 332 Geography of the Hawaiian Islands (3) (Y)** Introduction to the physical and human geography of Hawai'i. Development of island ecosystems. Polynesian pre-history, post-contact resource exploitation and environmental transformation. History of land tenure and management. Spatial aspects of agriculture, urbanization, and tourism. Pre: GEOG 101 or 103, or consent of instructor.
- GEOG 335 Geography of Oceania (3) (AY)** Physical and human geography of the Pacific Islands region including Australia and New Zealand (excluding Hawai'i). Topics include: regional marine and terrestrial resources; human settlement and landscape transformation; population and political geography; economic development, and resource management and environmental issues.
- GEOG 340 Principles of Land Use Planning (3)* (Y)** Land use planning and relationship of geographic concepts to urban, regional, and environmental planning. Emphasis on examples from Hawai'i.
- GEOG 350 Geography of Asia (3) (AY)** Introduction to the lands and peoples of Asia. Emphasis on the physical and cultural features which characterize the geography of Asia.
- GEOG 380 Quantitative Methods in Geography (3)* (AY)** Application of statistical and mathematical models in a geographic context. The use of multivariate techniques in assessing spatial relationships. Pre: GEOG 201 or consent of instructor.
- GEOG 385 Field Methods in Geography and Environmental Science (3)* (Y)** Geographic field methods for assessment and monitoring of the physical/biological/anthropogenic environment. Instrumentation, data collection, and analysis; planning and land management applications. Pre: GEOG 201 or consent of instructor. (Same as ENSC 385).
- GEOG 387 Literature of the Environment (3) (Y)** A study of modern nature writing and environmental issues in several genres. Students will explore how humans negotiate their place in a variety of physical environments. Pre: ENG 100 and one of the following: ENG 200, 251, 252, 253, or 254 or consent of instructor. (Same as ENG 387)
- GEOG 399 Directed Studies (1-3) (S)** Statement of planned reading or research required. Pre: junior standing and consent of instructor.
- GEOG 409 Principles of Landscape Ecology (3)* (Y)** Introduction to landscape ecology as a framework for landscape research, analysis, and management. Emphasis on spatial patterning—the causes, development, importance of ecological processes, and the spatial interactions of dynamic processes. Focus on concepts, methods, and applications of landscape ecology through reading classic and contemporary literature. Pre: GEOG 101, GEOG 201, GEOG 309, or BIOL 281 or consent of instructor. Some familiarity with geographic information systems (GIS) and statistics desirable. Offered in Spring semester only.
- GEOG 410 Plants and People (3) (Y)** Plants have had a profound impact on economic, social, and cultural history as sources of food, shelter, clothing, drugs, and raw materials. Contemporary issues related to plants-people also will be emphasized including problems of agriculture, plant industry, medicine, and conservation. Case studies from the Pacific world and Latin America will be highlighted. Pre: Any introductory course in geography, anthropology, biology, or agriculture. Offered in Spring semester only.
- GEOG 421 Urban Geography (3) (IO)** Cities: their origins, functions, and physical structure. Problems of urban growth, decay, and adaptation; evolution of urban institutions. Pre: GEOG 103 or consent of instructor.
- GEOG 430 Gender, Place, and Environment (3) (Y)** Surveys of trends in geography of gender related to place, space, and the environment. Addresses spatial interactions of gendered bodies of different ages, class, and ethnicities. Pre: Junior or Senior standing or one college level course in Women's Studies or consent of instructor. (Same as WS 430) Offered in Spring semester only.
- GEOG 435 Senior Seminar in Pacific Studies (3) (AY)** A reading and research seminar under the supervision of the Pacific Islands Studies faculty aimed at demonstrating competence in research and writing on issues related to Pacific Islands environments, culture, society and economy. Pre: consent of instructor for students near completion of Pacific Islands Studies Certificate coursework. (Same as ANTH 435)
- GEOG 440 Advanced Environmental Planning (3)* (Y)** Advanced topics in planning with emphasis on local land use plans, policies and ordinances as well as methodology for collection and analysis of data for environmental impact assessment. Pre: GEOG 340.
- GEOG 441 Environmental Impact Assessment (3)* (Y)** Introduction to the theory and methods of environmental impact assessment (EIA). Emphasis on the physical environmental, cultural, social, and legal foundations of the federal land state EIA process as well as how to minimize negative impacts on economic development. Students engage in critical evaluation and preparation of EIA. Pre: Junior or Senior standing or consent of instructor. Offered Fall semester only. (Same as

ENSC 441).

GEOG 470 Remote Sensing and Air Photo Interpretation (3)* (AY)

Analysis of film and digital images of the Earth's surface collected from cameras and sensors aboard aircraft and satellites. Applications to resource planning, forestry, hydrology and geology. Pre: GEOG 201 or consent of instructor.

GEOG 480 Geographic Information Systems and Visualization (3)* (Y)

Introduction to basic concepts and skills for using Geographic Information Systems (GIS) to analyze and visualize geospatial data. Topics covered include: computer representation of geographic information, construction of GIS databases, geospatial analysis and applications. Additional focus on visualization skills including cartographic principles and techniques. Pre: GEOG 201 or consent of instructor.

GEOG 481 Advanced Geo-Spatial Techniques (3)* (Y)

Advanced methods in GIS and spatial technologies for analysis of physical and human systems. Topics include network analysis, cartographic modeling, geospatial analysis, interpolation, as well as GIS project management. The course will include lecture, discussion, lab exercises, and a final GIS project. Pre: GEOG 201, GEOG 480 or GEOG 470 and consent of instructor. Familiarity with basic statistics also essential. Offered Fall semester only.

GEOG 490 Senior Thesis (3) (S)

Individual research project in area of interest. Pre: invitation by geography faculty.

GEOG 494 Special Topics in Geography (1-3) (IO)

Advanced topics chosen by the instructor. The course content will vary. It may be repeated for credit, provided that a different topic is studied.

GEOG 495 Senior Seminar, Geography (3) (Y)

Capstone course for Geography major, integrating previous coursework into disciplinary framework. Seminar focuses on research, writing, and discussion of themes in contemporary geography. Each student will choose a geographic sub-field of interest and prepare two seminar papers: (1) survey of historical development of sub-field including theoretical and cutting edge issues; (2) identify and investigate an original research problem in the chosen sub-field. Pre: Geography major, Senior standing. Offered Spring semester only. (Same as ENSC 495).

GEOG 496 Internship (3) (S)

Juniors and seniors majoring in geography may undertake in-service training in government or private agencies. Pre: junior standing and consent of instructor.

*Field trips are sometimes conducted outside of class hours.

GEOLOGY (GEOL)

College of Arts and Sciences

GEO 100 Environmental Earth Science (3)* (S)

Introduction to geology for non-science majors with an emphasis on the interaction between the Earth and its human population. The focus is on the solid Earth, natural hazards, natural resources, and pollution. Note: Geology students with an interest in environmental geology are encouraged to take GEO 300.

GEO 100L Environmental Earth Science Laboratory (1 3-hr. lab) (1) (Y)

Application of basic geological principles toward the understanding of man's relationship with the environment. Laboratory experiences in hazards mapping and assessment, environmental pollution, global change, and management of our geological resources. Develops skills in interpreting maps and remote sensing images. Pre: GEO 100 or GEO 300, which may be taken concurrently.

GEO 111 Understanding the Earth (3)* (S)

The study of the Earth, with emphasis placed on the materials, surface features, structures, various erosional and depositional processes, and the role of plate tectonics. Prepares student for further studies in geology.

GEO 111L Understanding the Earth Laboratory (1 3-hr. lab) (1) (S)

The basic techniques of topographic map/air photo interpretation and rock and mineral identification as applied to principles of physical geology. Pre: GEO 111, which may be taken concurrently. (Optional)

GEO 112 History of the Earth and Its Life (3)* (Y)

The evolution of the earth from the origin of the solar system to the present. Emphasis on plate tectonics, the history of life, and techniques used to reconstruct

past events from geologic evidence. Pre: GEO 111 or consent of instructor.

GEO 112L History of the Earth Laboratory (1 3-hr. lab) (1) (Y)

Includes topics on fossils and fossilization, measurement of geologic time, stratigraphy, biostratigraphy, geotectonics, paleoecology, sedimentology, and the interpretation of geological maps. Pre: GEO 112, which may be taken concurrently, and GEO 111L. (Optional)

GEO 194 Special Topics in Geology (1-3)* (IO)

Topics chosen by the instructor. The course content will vary. It may be repeated for credit, provided that a different topic is studied.

GEO 195 Introductory Field Experience (1) (AY)

Pre- or post-semester field trip (1-2 weeks) to exceptional geologic localities. During the semester students will become familiar with the geologic formations, structure, and history of the area to be visited. Pre: Prior course in Geology. CR?NC grade. Repeatable for credit. Offered in Spring Semester only, alternate years.

GEO 202 Coasts and Beaches (3) (S)

Survey of the natural processes and human influences shaping the world's beaches and coasts. Required weekend field trips to sites that illustrate the traditional use of coastal resources by native Hawaiians.

GEO 205 Geology of the Hawaiian Islands (3)* (S)

A survey of the geological phenomena particular to the Hawaiian Islands, including volcanism, rock and mineral occurrences, landform development, and water resources.

GEO 212 Earth Materials I: Minerals (3 lec., 1 3-hr. lab) (4) (AY)

A systematic study of the common minerals involving crystallography, optical properties, crystal chemistry, and occurrence. Laboratory work stresses identification of minerals in hand specimen and using the petrographic microscope. Pre: GEO 111 and either CHEM 114 or 124 or consent of the instructor.

GEO 299 Directed Studies (1-3) (IO)

Statement of planned reading or research required. Pre: sophomore standing and consent of instructor.

GEO 300 Advanced Environmental Earth Science (3) (AY)

In-depth study of the interactions between the human population and our planet. Natural resources, pollution and natural hazards, current issues such as the food supply and the energy crisis. Community concerns such as waste, natural hazards and environmental legislation. Pre: Upper division standing and GEO 111 or GEO 100 or GEO 170 or GEO 101 or ENSC 100 or MARE 201.

GEO 320 Earth Materials II: Igneous/Metamorphic Rocks (3 lec., 1 3-hr. lab) (4) (AY)

An introduction to the study of rocks, including their origin, occurrence, composition and classification. Laboratory work involves the identification of rocks in hand specimen and thin section by means of composition and texture. Emphasis on igneous and metamorphic rocks. Pre: GEO 212 or consent of instructor.

GEO 330 Deformation of the Earth (2 lec, 1 3-hr. lab) (3)* (AY)

Effects and mechanics of deformation of the earth's crust, involving the description, classification, and origin of geologic structures. Aspects of geotectonics are considered. Pre: GEO 112 and prerequisites listed for MATH 205, or consent of instructor.

GEO 340 Sedimentary Processes (2 lec, 1 3-hr. lab) (3) (AY)

Emphasis on sedimentary processes, properties of sediments and sedimentary rocks, environmental interpretation, and stratigraphic principles and nomenclature. Required field trips. Pre: GEO 112.

GEO 342 Earth Surface Processes (3)* (AY)

Processes of landform development at large and small scales. Theoretical and applied aspects, including human environment considerations. Pre: GEO 101 or GEO 111 or equivalent. (Same as GEO 320)

GEO 352 Comparative Planetology (3) (IO)

Study of the geology and geophysics of Earth-like planets and satellites in the Solar System, with emphasis on understanding terrestrial geology in a border, astronomical context. Study of the atmosphere of Solar System planets and satellites, and also the formation and evolution of the Solar System and extra solar planetary systems. Pre: GEO 111, ASTR 180 (Same as ASTR 352)

GEO 360 Surface Water (3) * (AY)

Introduction to surface hydrology. Topics include streamflow, hydraulics, flooding, soil moisture, evapo-

transpiration, and stream water quality. Introduction to measurement techniques, quantitative descriptions of hydrologic phenomenon, and practical applications. Pre: GEOL 111 and competence in algebra, or consent of instructor.

GEOL 370 Field Methods (1 lec, 2 3-hr. lab) (3) (AY) Familiarization with field instrumentation and techniques. The study of methods used to collect, graphically represent, and interpret geological field data. For the last third of the class, students choose between a post-semester geologic mapping project in California or a geologic mapping project in Hawaii. Pre: GEOL 330 or consent of instructor.

GEOL 394 Special Topics in Geology (1-3)* (IO) Advanced topics chosen by the instructor. The course content will vary. It may be repeated for credit, provided that a different topic is studied. Pre: junior standing and consent of instructor.

GEOL 399 Directed Studies (1-3) (IO) Statement of planned reading or research required. Pre: junior standing and consent of instructor.

GEOL 431 Geology of North America (3) (AY) Survey of the structure, stratigraphy, and tectonic evolution of the North American continent from the Precambrian to Recent. Pre: GEOL 112 or consent of instructor.

GEOL 445 GIS for Geology (2 lec, 1 3-hr. lab) (3) (AY) Introduction to the use of Geographical Information Systems for storing, displaying, and analyzing geospatial data. Theories, applications in earth and environmental sciences, databases, and data analysis. Pre: GEOL 111 and upper-division standing or consent of instructor. Basic computer skills are strongly recommended.

GEOL 450 Geological Remote Sensing (2 lec, 1-2-hr. lab) (3) (IO) Application of remote sensing to volcanic hazards, global change, and geologic mapping. Exploration of both satellite and airborne sensor imagery with laboratory exercises focused on modern remote sensing visualization tools and interpretation of optical, thermal and thematic data suites. Pre: Any lower-division geology class.

GEOL 460 Groundwater (3) (AY) Introduction to groundwater hydrology. Topics include aquifer properties, principles of groundwater flow, quantity and quality of groundwater resources, water chemistry, groundwater contamination and the role of groundwater in geologic processes. Quantitative focus. Pre: GEOL 111, 111L, prior course in chemistry at the high school or college level, and MATH 115 or 205, or consent of instructor.

GEOL 470 Volcanology (2 lec, 1 3-hr lab) (3)* (AY) In-depth study of volcanic processes, products, and phenomena, including the classification of volcanic eruptions, evaluation of volcanic hazards, and an introduction to eruption monitoring. Pre: GEOL 320 or consent of instructor.

GEOL 471 Volcano Monitoring (3) * (Y) Survey of deformation, seismological, geochemical, and field mapping methods of monitoring active volcanoes, and their use in forecasting eruptions. Emphasis on field applications. Pre: Previous college credit in geology, mathematics, and other physical science, or consent of the instructor.

GEOL 472B Seismology of Volcanoes (1) * (IO) Investigation of seismotectonic processes of active volcanoes, including sources of earthquakes, volcanic tremor, seismic tomography, and seismic methods for volcanic monitoring. Field deployment of portable seismographs and operation of telemetered, digital seismic networks. Pre: College credit in geophysics and calculus, or consent of instructor.

GEOL 495A-495B Seminar (1-1) Yr. (S) Seminar presentations of topics in the physical sciences by faculty, enrolled students and invited speakers. The first semester (495A) is taken CR/NC; in the second semester (495B), students are required to present a seminar for a letter grade. Pre: senior standing or consent of instructor. (Same as ASTR 495A-495B, CHEM 495A-495B, PHYS 495A-495B and MATH 495A-495B)

*Field trips are sometimes conducted outside of class hours.

HAWAIIAN LANGUAGE (HAW)

Ka Haka 'Ula O Ke'elikōlani College of Hawaiian Language

HAW 100 Hawaiian Language in Action (2) (S) A beginning immersion experience in Hawaiian focusing on the spoken use of the language. A) usage referring to locations and relationships, E) usage referring to

processes and actors, I) other. (May be repeated for credit if subletters are different.) Meets two times weekly. No prerequisites.

HAW 101-102 Elementary Hawaiian (4-4) Yr. (Y) Development of listening, speaking, reading and writing skills. Taught within the context of the contemporary culture of the Hawaiian people. Language laboratory required.

HAW 107 Accelerated Elementary Hawaiian (8) (Y) Contents of 101-102 covered in one semester. Meets 2 hours daily, Monday through Friday. Language laboratory required. Pre: consent of instructor.

HAW 194 Special Introductory Topics in Hawaiian (1-4) Topics chosen by the instructor. Course content will vary. May be repeated for credit, provided that a different topic is studied. Pre: consent of instructor.

HAW 199V Directed Studies (1-3) Permission of instructor and statement of planned reading or research required.

HAW 201-202 Intermediate Hawaiian (4-4) Yr. (Y) Continuation of 102. Conducted in Hawaiian. Language laboratory required. Pre: HAW 102 or equivalent.

HAW 207 Accelerated Intermediate Hawaiian (8) (Y) Contents of 201-202 covered in one semester. Meets 2 hours daily, Monday through Friday. Language laboratory required. Pre: 102 or 107.

HAW 294 Special Intermediate Topics in Hawaiian (1-4) (AY) Topics chosen by instructor. Course content will vary. May be repeated for credit, provided that a different topic is studied. Pre: Hawaiian course at the introductory level and consent of instructor.

HAW 299V Directed Studies (1-3) Permission of instructor and statement of planned reading or research required. Pre: sophomore standing.

HAW 303-304 Third-Level Hawaiian (4-4) Yr. (Y) Continuation of 202. Advanced structures, expressions and patterns. Conducted in Hawaiian. Language laboratory required. Pre: C or better in HAW 202 or 207, or permission from the instructor.

HAW 399V Directed Studies (1-3) Permission of instructor and statement of planned reading or research required. Pre: junior standing.

HAW 403-404 Fourth-Level Hawaiian (4-4) Yr. (Y) Continuation of 304. Advanced structures, expressions, and patterns. Conducted in Hawaiian. Language laboratory required. Pre: C or better in 304 or permission from the instructor.

HAW 425 Translation into Hawaiian (3) This course trains students to translate from English into Hawaiian. A wide range of materials is covered, from school texts to news items and legal material. Pre: HAW 404, which, with permission, may be taken concurrently.

HAW 453 Hawaiian Phonetics and Phonology (3) (AY) Sound system of the Hawaiian language. Stylistic and regional variation. Interaction of the Hawaiian sound system with the sound systems of other languages, especially that of English. Conducted in Hawaiian. Pre: HAW 202 or equivalent, which, with permission, may be taken concurrently, or equivalent. LING 102, LING 211, LING 311 recommended. (Same as LING 453)

HAW 454 Hawaiian Morphology and Syntax (3) (AY) Grammatical system of the Hawaiian language. Conducted in Hawaiian. Pre: HAW 202 or equivalent, which, with permission, may be taken concurrently, or equivalent; LING 102 recommended. (Same as LING 454)

HAW 455 Hawaiian: A Polynesian Language (3) (AY) The similarities and differences among Polynesian languages and the reconstruction of their common ancestor language. The development of Hawaiian from that common ancestor. Conducted in Hawaiian. Pre: HAW 303, which may be taken concurrently, and HAW 453. HAW 454, LING 102, LING 371 recommended. (Same as LING 455)

HAW 490 Base-Level Fluency for Hawaiian Medium Education (1) A review and strengthening of Hawaiian language fluency skills with focus on their applicability to Hawaiian medium education. Must be taken credit/no credit. Conducted in Hawaiian. Pre: Six semester hours of college fourth-level Hawaiian and permission from the Division.

HAW 494 Special Advanced Topics in Hawaiian (3) (AY) Topics chosen by instructor. Course content will vary. May be repeated for credit, provided that a different topic is studied. Conducted in Hawaiian. Pre: Hawaiian language course at the intermediate level and consent of instructor.

HAW 499V Directed Studies (1-3) Permission of instructor and statement of planned reading or research required. Pre: senior standing.

HAWAIIAN STUDIES (HWST)

Ka Haka 'Ula O Ke'elikōlani College of Hawaiian Language

HWST 111 The Hawaiian 'Ohana (3) (S) The culture of the Hawaiian people as expressed in the home and family. The position of the family as the basis of the larger Hawaiian society and culture. Both ancient and modern aspects covered; extensive use of Hawaiian terminology.

HWST 175 Introduction to the Music of Polynesia (3) (AY) A general survey of the indigenous and acculturated music of eight major Polynesian island groups: Tonga, Samoa, New Zealand, Cook Islands, Society Islands, Marquesas Islands, Easter Island and Hawai'i. Music is viewed as both an organization of sound and as a product of culture and people. (Same as MUS 175)

HWST 176 The History and Development of Hawaiian Music (3) (AY) A general survey of the interrelationships of indigenous and acculturated Hawaiian music. Vocal music genres to be discussed include: chant; Christian hymn singing; secular choral singing; male and female falsetto singing; Chalangalang; Hapa Haole; and contemporary. Instrumental music genres include: pre-European instrumental styles; slack key guitar; 'ukulele; and steel guitar. (Same as MUS 176)

HWST 194 Special Topics in Hawaiian Studies (1-3) Topics chosen by instructor. The course content will vary. It may be repeated for credit, provided that a different topic is studied. Pre: consent of instructor.

HWST 199V Directed Studies (1-3) Permission of instructor and statement of planned reading or research required.

HWST 205 Hawaiian Music in Action (2) (S) Learning Hawaiian songs as a means of strengthening knowledge of language, poetry and culture. A) mele 'āina, E) mele pili kanaka, I) other. (May be repeated for credit if subletters are different.) Conducted in Hawaiian. Pre: HAW 101 or 107.

HWST 211 Hawaiian Ethnobotany (3) (S) Hawaiian herbs and plants: their identification, their place in the heritage of the Hawaiian people, their medicinal properties, and other practical uses; extensive use of Hawaiian terminology.

HWST 213 Hawaiian Ethnozoology (3) (S) Hawaiian fishes, birds, and other creatures: their identification, their place in the heritage of the Hawaiian people, methods of capture, their practical uses; extensive use of Hawaiian terminology.

HWST 294 Special Topics in Hawaiian Studies (1-3) Topics chosen by the instructor. The course content will vary. It may be repeated for credit, provided that a different topic is studied. Pre: Hawaiian Studies course at the introductory level and consent of instructor.

HWST 299V Directed Studies (1-3) Permission of instructor and statement of planned reading or research required. Pre: sophomore standing.

HWST 394 Special Topics in Hawaiian Studies (1-3) Topics chosen by the instructor. The course content will vary. It may be repeated for credit provided a different topic is studied. Pre: Hawaiian Studies course at the intermediate level and consent of instructor.

HWST 399V Directed Studies (1-3) Permission of instructor and statement of planned reading or research required. Pre: junior standing.

HWST 405 Hana No'eau (1) (S) Traditional Hawaiian arts taught in Hawaiian. (A) lau hala, (E) 'upena/kōkō (types of nets), (I) hulu manu (feather work), (O) other. (May be repeated for credit if topics are different.) Pre: HAW 202 or equivalent, which, with permission, may be taken concurrently, or equivalent.

HWST 431 Living Hawaiian Language Communities (3) An examination of the Hawaiian-speaking community of Hawai'i today and the

interface between language, culture, and other languages and cultures in Hawai'i. Pre: HAW 403 or equivalent, which, with permission, may be taken concurrently.

HWST 461 Pana Hawai'i (3) (Y) Traditions and literature of pana (named sites of cultural importance). Emphasis on islands of (A) Hawai'i, (E) Maui, (I) Moloka'i and Lāna'i, (O) O'ahu, (U) Kaua'i and Ni'ihau. Conducted in Hawaiian. (May be repeated for credit if subletters are different.) Pre: HWST 111; HAW 202 or equivalent, which, with permission, may be taken concurrently, or equivalent.

HWST 462 Haku Mele (3) (AY) Hawaiian poetry as literature. Survey and analysis of traditional and modern forms, methods of composition, poetic language, imagery, and kaona (hidden meaning). Interpreting and composing poetry in Hawaiian. Pre: HAW 303, which may be taken concurrently, or consent of the instructor; HWST 361 recommended. Conducted in Hawaiian.

HWST 463 Introduction to Hawaiian Narrative Literature (3) Introduction to Hawaiian narrative literature, both oral and written. Short traditional tales, excerpts from longer forms, comparison of narrative literature with poetry and conversational event recordings. Pre: HAW 304, which, with permission may be taken concurrently.

HWST 464 Hawaiian Composition (3) Essays and articles in Hawaiian focusing on traditional Hawaiian aesthetics and well-formed presentation. Attention to cultural differences in presentation of material. Pre: HAW 404, which, with permission, may be taken concurrently. Recommended: ENG 315, HAW 453.

HWST 471 Mele 'Auana (3) (AY) Hawaiian musical traditions initiated since 1778 (e.g., falsetto singing, slack key, hīmeni, etc.). Traditions concerning their sources and history. Some attention given to performance. Conducted in Hawaiian. Pre: HAW 202 or equivalent, which, with permission, may be taken concurrently; HWST 361, HWST 462.

HWST 472 Hula 'Auana (3) (AY) Hawaiian dance forms initiated since 1778. Traditions concerning their sources and history. Some attention given to performance. Conducted in Hawaiian. Pre: HAW 202 or equivalent, which, with permission, may be taken concurrently; HWST 361, 462, 471 recommended.

HWST 473 Oli/Mele Kahiko (3) (AY) Hawaiian musical forms initiated prior to 1778 (e.g. chanted lamentations, chanted greetings, dance chants, etc.). Traditions concerning their sources and history. Some attention given to performance. Conducted in Hawaiian. Pre: HAW 202 or equivalent, which, with permission, may be taken concurrently; HWST 361, 462, 471 recommended.

HWST 474 Hula Kahiko (3) (AY) Hawaiian dance forms initiated prior to 1778. Traditions concerning their sources and history. Some attention given to performance. Conducted in Hawaiian. Pre: HAW 304 or equivalent, which, with permission, may be taken concurrently; HWST 361, 462, 471, 473 recommended.

HWST 494 Special Advanced Topics in Hawaiian Studies (3) (AY) Topics chosen by the instructor. Course content will vary. May be repeated for credit, provided that a different topic is studied. Pre: Hawaiian Studies or Hawaiian language course at the intermediate level and consent of instructor.

HWST 497 Hawaiian Studies Seminar (3) (Y) Readings, research and field work on the traditional and contemporary Hawaiian community. Conducted in Hawaiian. Pre: HAW 303 and senior standing, or consent of instructor.

HWST 499V Directed Studies (1-3) Permission of instructor and statement of planned reading or research required. Pre: senior standing.

HISTORY (HIST)

College of Arts and Sciences

HIST 151, 152 World History (3/3) Yr. (Y/Y) History of the world from prehistoric origins to the present. HIST 151: prehistory to 1500; HIST 152: from 1500 to the present. Satisfies General Education World Cultures Requirement.

HIST 274 History of Hawaii (3) (Y) A survey course in the history of the Hawaiian Islands from Polynesian origins to contemporary multi-

cultural society. Traces the impact of major events and historical figures upon Hawaiian society, and also considers the Hawaiian response to these changes.

HIST 300 Historical Methods (3) (Y) Methods of conducting historical research, including library, Internet, and archival research, in addition to an introduction to issues of professional historiography. Students will complete a wide variety of exercises designed to prepare them for the historical work of the major. Pre: Sophomore standing or consent of instructor.

HIST 309 History of Asian Religions (3) (AY) The historical development of Asian religious traditions from their origins to the present, with an emphasis on the major traditions of India, China, and Japan. Spring semester only. Pre: Sophomore standing or consent of instructor.

HIST 310 History of Japan I: Early Japan (3) (AY) Japanese history and culture from prehistory to the mid-17th century. Topics include: origins of Japanese people and culture; the Imperial state; contacts with China and Korea; aristocratic culture, particularly the role of women; the samurai class and the Shogunates; Buddhism and Shinto; late medieval disorder and development; unification and pacification. (Same as JPST 310) Pre: Sophomore standing or consent of instructor.

HIST 311 History of Japan II: Tokugawa to Meiji (3) (AY) Japanese history and culture from the 17th through 19th centuries. Topics include: samurai and the class system; political change, economic growth and social tensions; urban and rural evolution; popular culture and literature; Japan's isolation and reopening; collapse of the Tokugawa system; the Meiji Restoration; dissolution of the samurai class; social reorganization and rapid modernization; the Meiji Constitution and new Imperial state. (Same as JPST 311) Pre: Sophomore standing or consent of instructor.

HIST 312 History of China I: Early China (3) (AY) Chinese history and culture from prehistory through the Ming Dynasty. Topics include: Chinese philosophy, culture, religion, and literature; the Imperial State; family institutions; China's relationship with border societies; dynastic cycles and creative disorder; technology and economic change; education and the state examination system; Mongol invasion and empire; China's role in world trade. Pre: Sophomore standing or consent of instructor.

HIST 313 History of China II: Qing (3) (AY) Chinese history and culture from the 17th century through the fall of the Qing in 1912. Topics include: fall of the Ming and establishment of the Qing dynasty; Manchu-Han relations; economic growth and world trade; opium; international relations; reformers, reform movements, and uprisings; adapting Western ideas and technology; collapse of the Qing. Pre: Sophomore standing or consent of instructor.

HIST 314 History of Japan III: 20th Century to Present (3) (AY) Japanese history and culture from 1890 to present. Topics include: Meiji and 1947 constitutions; democracy and leadership; militarism and pacifism; evolving Imperial institution; economic growth and social change; tradition and modernity in Japanese culture; Japan's place in world systems and world culture. (Same as JPST 314) Pre: Sophomore standing or consent of instructor.

HIST 316 Pacific History I (3) (AY) Melanesia, Micronesia and Polynesia from pre-contact to 1900: Euro-American exploration, culture contact, and colonial annexation. Pre: Sophomore standing or consent of instructor.

HIST 317 Pacific History II (3) (AY) Melanesia, Micronesia and Polynesia from 1900 to the present: colonial exploitation, decolonization, independence and the search for identity in the contemporary world. Pre: Sophomore standing or consent of instructor.

HIST 318 History of China III: 20th Century to Present (3) (AY) Chinese history and culture from 1900 to present. Topics include: Fall of the Qing dynasty; Republic of China; warlordism; imperialism and Chinese resistance; Civil War; Communist reunification of the mainland; People's Republic under Mao Zedong; post-Mao Chinese economic reforms and leadership; Nationalist Taiwan's economic growth and slow democratization; international relations including overseas Chinese. Pre: Sophomore standing or consent of instructor.

HIST 319 European Women's History (3) (AY) Study of European women from pre-history through the 20th century with emphasis on women's social and cultural roles in western history. Current feminist theory is also studied. (Same as WS 319) Pre: Sophomore standing or consent of instructor.

HIST 321 History of Australia and New Zealand (3) (Y) Both Australia and New Zealand are part of the broader Pacific region, had colonies in the Pacific, and continue to have significant influence in the islands. This course examines the origin and nature of their indigenous populations, the evolving nature of their settler communities with Great Britain in the 19th century, and their development as independent nations in the 20th century. Offered in Spring Semester only. Pre: Sophomore standing or consent of instructor.

HIST 322 The Bible and History (3) (AY) Selected books of the Old and New Testaments with reference to their historical and cultural background. Pre: Sophomore standing or consent of instructor.

HIST 323 Ancient Greece (3) (AY) Political, social, and cultural history of ancient Greece from the Minoan to Hellenistic periods. Pre: Sophomore standing or consent of instructor.

HIST 331 World War II in the Pacific Islands (3) (AY) A survey of the impact of World War II in the Pacific Islands. Topics covered include the Pacific Islands in the pre-war period, effects of the battles and presence of foreign forces on Pacific Island societies, resulting changes in colonial relationships, and the new strategic position of the Pacific Islands in the post-war period. Pre: Sophomore standing or consent of instructor.

HIST 332 Hawaiian Kingdom (3) (Y) History of Hawai'i from early migrations and settlement to the 1890's with emphasis on political and social history: formation of the Kingdom of Hawaii, changes in land tenure, disease and de-population issues, the 1893 overthrow of the monarchy, and annexation. Offered Fall semester only. Pre: Sophomore standing or consent of instructor.

HIST 333 Twentieth Century Hawaii (3) (Y) History of Hawaii since the overthrow of the monarchy in 1893, covering the Republic of Hawaii and the period under United States control—immigration, World War II, the labor movement and the red scare, Hawaiian renaissance, and the sovereignty movement. Offered Spring semester only. Pre: Sophomore standing or consent of instructor.

HIST 336 Disease and Medicine in 19th Century Hawaii (3) (Y) This course considers the role of health, disease, and medicine in 19th century Hawaii by bringing together the approaches of history and medical anthropology with the understandings of biomedicine. Perceptions of health, the body, and medicine, and the impact of epidemic diseases in Hawaii's cultural, social, and political history, from both Native Hawaiian and Western perspectives, are examined. Offered Spring semester only. Pre: Sophomore standing or consent of instructor.

HIST 340 History of Religion in America (3) (AY) A historical and thematic study of the growth of religion in America from the seventeenth century to the present. Pre: Sophomore standing or consent of instructor.

HIST 341 Ancient Rome (3) (AY) Political, cultural, and social history of ancient Rome from the Etruscans to 476 C.E. Pre: Sophomore standing or consent of instructor.

HIST 353 English History and Shakespeare (3) (AY) This course explores the relationship between the events of 14th, 15th, and 16th century English history and Shakespeare's history plays.

HIST 354 Introduction to Islamic History (3) (AY) A history of the growth and development of Islam from the time of Muhammad to the present. Special attention given to relationship of Islam to the history and religious traditions of Europe. Fall semester only. Pre: Sophomore standing or consent of instructor.

HIST 356 Medieval Europe (3) (AY) A survey of the social, intellectual, cultural, and political development of Europe from the fall of the Roman Empire to the late fifteenth century. Topics covered include feudalism, religion, the crusades, trade, epidemic disease, and warfare. Pre: Sophomore standing or consent of instructor.

HIST 357 Renaissance and Reformation (3) (AY) Political, social, intel-

- lectual, religious, and artistic development of the Renaissance and the Protestant and Catholic Reformations. Pre: Sophomore standing or consent of instructor.
- HIST 358 Women in Christianity (3) (Y)** Examines issues relating to sex and gender throughout the history of Christianity. Emphasizing primary texts, the course will explore writings by Christian women and Christian writings about women. Offered Fall semester. (same as WS 358)
- HIST 359 Christianity and the Western Tradition (3) (AY)** An introduction to the history and spirituality of Christianity and its relationship to the “Western Tradition” from its origins to the present. Fall semester only. Pre: Sophomore standing or consent of instructor.
- HIST 360 American Women’s History (3) (AY)** Study of American women from the 17th through the 20th centuries. Special emphasis will be on women’s social and cultural roles. Current feminist theory is also studied. (Same as WS 360) Pre: Sophomore standing or consent of instructor.
- HIST 365 War and Empire in Eighteenth-Century Europe (3) (AY)** A survey of the social, intellectual, cultural, and political development of Europe from the War of the Spanish Succession to the advent of the Napoleonic era. Topics covered include absolutism, Enlightenment, mercantilism, military conflict, and revolution. Pre: Sophomore standing or consent of instructor.
- HIST 375 Europe in the Nineteenth Century (3) (AY)** A survey of the social, intellectual, cultural, and political development of Europe from the Napoleonic era to the outbreak of the First World War. Topics covered include industrialization, nationalism, socialism, liberalism, imperialism, warfare, and revolution. Pre: Sophomore standing or consent of instructor.
- HIST 379 History of Entrepreneurship in America (3) (AY)** The role of entrepreneurship in developing the American business system from its European origins to its current global manifestations and its future prospect. Focus on the value, characteristics, and practices of entrepreneur and on the changing relations over time between business, labor and government (Same as Mgt 379). Pre: Sophomore standing or consent of instructor.
- HIST 380 United States: 1620-1789 (3) (AY)** The political, social, and intellectual history of North America from the time of European contact until 1789. Topics include: Native American settlement and polity; European settlement; colonial America; causes and course of the American revolution; development of republican government; constitutional convention; ratification of the federal Constitution. Pre: Sophomore standing or consent of instructor.
- HIST 381 United States: 1790-1865 (3) (AY)** The political, social, and intellectual history of the United States from the Early National Period through the Civil War. Topics include: Marshall Court, market revolution and early industrialization, immigration, Jacksonian democracy, social reform movements, sectionalism, Mexican War, Civil War, emancipation. Pre: Sophomore standing or consent of instructor.
- HIST 382 United States: 1866-1929 (3) (AY)** The political, social, and intellectual history of the United States from Reconstruction through the Stock Market Crash of 1929. Topics include: key Supreme Court issues, Reconstruction, industrialization, immigration, racial tension, U.S. imperialism, Progressivism, World War I, economic change. Pre: Sophomore standing or consent of instructor.
- HIST 383 United States: 1930-1980 (3) (AY)** The political, social, and intellectual history of the United States from the Great Depression through the Carter presidency. Topics include: FDR’s New Deal, World War II, Civil Rights Movement, Cold War, Kennedy’s New Frontier, U.S. involvement in Vietnam, the Watergate crisis. Pre: Sophomore standing or consent of instructor.
- HIST 385 Europe in the Era of World War I (3) (AY)** A survey of the social, intellectual, cultural, and political development of Europe from the late nineteenth century to the interwar period. Topics covered include nationalism, imperialism, art, trade, culture and warfare. Special emphasis on World War I and its effect upon modern European development. Pre: Sophomore standing or consent of instructor.
- HIST 392 Japanese Women (3) (AY)** History of women in Japan from the earliest historical eras, including the Heian aristocracy and evolving samurai culture, through the present. Topics include property rights, family structures, the influence of religion and secular philosophies, effects of political and legal changes, women’s role in the economy and its effect on their status and lives, and women’s activism. (Same as JPST 392 and WS 392) Pre: Sophomore standing or consent of instructor.
- HIST 394 Special Topics in History (3) (S)** Advanced topics chosen by the instructor. The course content will vary. May be repeated for credit, provided that a different topic is studied: b) American, c) European, d) Asian, e) Pacific, h) Hawaiian. Pre: junior standing or consent of instructor.
- HIST 395 Europe in the Era of World War II (3) (AY)** A survey of the social, intellectual, cultural, and political development of Europe from the interwar period through the Cold War. Topics covered include the Depression, Fascism, totalitarianism, the Holocaust, the Cold War, and decolonization. Special emphasis on World War II and its effect upon modern European development. Pre: Sophomore standing or consent of instructor.
- HIST 420 Mao (3) (IO)** An in-depth investigation into the life, career, and legacy of Mao Zedong, China’s dominant 20th century figure. Competing political and historical interpretations will be examined using biography, primary sources in translation, and secondary scholarship. Pre: Junior standing and previous coursework in Asian history or consent of instructor. Fall semester only. **NOTE:** Course begins in Fall, 2008.
- HIST 425 History of Russia to 1700 (3) (AY)** Development of Russian thought, institutions, society, and culture. Warfare, dynastic consolidation, and territorial expansion to 1700. Pre: One 300-level European survey course, or consent of instructor.
- HIST 435 Russia Since Peter the Great (3) (AY)** The development of Russian thought, society, government and institutions from 1700 to the Second World War. Special emphasis on Russian westernization and reform as they were encouraged or abandoned during the reigns of Russian leaders from Peter the Great through Stalin. Pre: One 300-level European survey course, or consent of instructor.
- HIST 445 European Imperialism (3) (AY)** The origins and development of European imperialism and its political, social, and environmental impact on the world. Special emphasis on the period from 1850 to the First World War. Pre: One 300-level European survey course, or consent of instructor.
- HIST 455 European Intellectual History Since 1789 (3) (AY)** Intellectual and cultural development of Europe since 1789. Ideas in the arts, philosophy, science, literature, and politics as they have affected Europe. Pre: One 300-level European survey course, or consent of instructor.
- HIST 459 Germany Since Frederick the Great (3) (AY)** Development of Germany since 1740 in political, social, and economic fields. Special emphasis on the growth of the Prussian state, German unification, the two World Wars and the rise of totalitarianism. Pre: One 300-level European survey course, or consent of instructor.
- HIST 470 United States in the World 1865–2003 (3) (AY)** U.S. expansion, imperialism, diplomacy, and foreign relations from 1865. Pre: 300-level US survey course, or consent of instructor.
- HIST 471 U.S. Constitutional History (3) (AY)** U.S. constitutional history including discussions of constitutional development, state sovereignty, civil liberties, freedom of contract, affirmative action, and the modern presidency. Pre: One 300-level US survey course, or consent of instructor.
- HIST 481 Land and Sovereignty in the Pacific (3) (Y)** Land is fundamental to traditional Pacific Island societies. Colonial rule meant a loss of both political sovereignty and, in many cases, significant amounts of land through private alienation and government acquisition. Using case studies, this course will investigate the historical relationship between land and sovereignty as Pacific people have sought to regain and maintain their independence.
- HIST 485 Seminar in World History (3) (AY)** Investigation and discus-

sion of major issues and events in world history. May be applied to any track, depending on area of research. Pre: One 300-level history course or consent of instructor.

HIST 486 Women in Ancient European Civilization (3) (AY) Study of European women up to the year 800, with primary focus on the Mediterranean Basin. Themes encompass religion, social customs, and economic activities. Pre: One of the following 300-level courses (HIST 319, 323, 341, 356, or 360) or consent of instructor. Same as WS 486.

HIST 490 Historiography and Research Methods (3) (S) Course focuses on historiography and research methods in history, resulting in a research paper in the student's area of emphasis for the Senior Thesis. Required of all history majors. Pre: senior standing and HIST 300: Historical Methods or consent of instructor.

HIST 491 Senior Thesis (3) (S) Course focuses on the writing of a thesis paper on a topic in the student's area of emphasis. Required of history majors selecting the Thesis option. Recommended for students planning to enter graduate programs. Pre: HIST 490.

HIST 492 Senior Project (3) (Y) Application of historical knowledge and methods to community issues. Possible projects include historical society internships, collection of oral history, development of local historical materials, and cooperative projects with local schools. Pre: HIST 490 and consent of instructor. (offered every Spring)

HIST 494 Special Topics in History (1-3) (S) Advanced topics chosen by the instructor. The course content will vary. It may be repeated for credit, provided that a different topic is studied. b) American, c) European, d) Asian, e) Pacific, h) Hawaiian. Pre: Junior standing and consent of instructor.

HIST 499 Directed Studies (1-3) (S) Statement of planned reading or research required. Pre: senior standing and consent of instructor.

HORTICULTURE (HORT)

College of Agriculture, Forestry and Natural Resource Management

HORT 262 Principles of Horticulture (2 lec., 1 lab) (3) (S) Introduction to the various divisions of horticulture and the relationship of plants to environment. Plant structure and function. Opportunity for observation and practice of various horticultural technologies. Students are required to participate in a garden project.

HORT 263 Hydroponics (2 lec., 1 lab) (3) (Y) Introduction to circulating and non-circulating hydroponic methods. Students are required to participate in the construction and maintenance of a hydroponic system. Pre: HORT 262.

HORT 264 Plant Propagation (2 lec., 1 lab) (3) (Y) Seminal propagation; vegetative propagation by cuttings, grafting, budding, layering, division and separation. Propagating systems and plant tissue culture. Recommended: HORT 262.

HORT 266 Nursery Management (3 lec., 1 lab) (4) (Y) Horticultural and management practices involved in the operation of wholesale nurseries in Hawai'i with emphasis on production of tropical foliage plants. Practical laboratories will apply principles to cultivate crops. Excursions to various nurseries. Pre: HORT 262 or consent of instructor.

HORT 303 Introduction to Plant Tissue Culture (2 lec., 1 lab) (3) (S) Introduction to the basic concepts and principles of tissue culturing plants. Special emphasis will be placed on setting up a laboratory and other business concerns. Limited enrollment. Pre: HORT 262, CHEM 124 or consent of instructor; recommended: HORT 264.

HORT 304 Plant Tissue Culture Acclimatization (2 lec., 1 lab) (3) (Y) Discussion and application of methods employed to acclimate locally tissue cultured plants. Limited enrollment. Pre: HORT 262; recommended: HORT 303.

HORT 350 Tropical Landscape Horticulture (2 lec., 1 lab) (3) (Y) Identification of landscape plants; design, construction, installation, care and maintenance of landscapes. Limited enrollment. Pre: HORT 262 or BIOL 175.

HORT 351 Vegetable Crop Production (2 lec., 1 lab) (3) (Y) Vegetable

cultural methods, postharvest handling method and marketing. Special emphasis will be placed on growing crops for market sales. Pre: HORT 262 or consent of instructor.

HORT 352 Tropical Fruit Production (2 lec., 1 lab) (3) (Y) History, botanical relationships, climatic relationships, culture, management, and marketing. Excursions to various fruit orchards. Pre: HORT 262 or consent of instructor.

HORT 354 Floriculture and Ornamental Production (3 lec., 1 lab) (4) (Y) Cultural and management practices in production of cut flowers and flowering pot plants. Major Hawaiian and mainland flower crops are considered. Visits to anthurium and other enterprises. Pre: HORT 262 or consent of instructor.

HORT 360 Orchid Culture (3 lec., 1 lab) (4) (Y) Systematics, anatomy, physiology, and breeding of orchids with emphasis on production of orchid plants and flowers. Practical laboratories will include culture from pollination to marketing and field trips to local orchid nurseries.

HORT 437 Structure of Tropical Plants (3 lec., 1 lab) (4) (AY) Plant structure in relation to cultural practices, functions, genetic factors and development. Pre: BIOL 175. (Same as BIOL 417)

HORT 450 Advanced Plant Tissue Culture (2 lec., 1 lab) (3) (S) Provides the student with hands-on experience in plant tissue culture techniques. Evaluative and diagnostic skills will be emphasized. Students will design and test techniques most appropriate for tissue culturing plant(s) of interest. Limited enrollment. Repeatable for a maximum of 6 credit hours. Pre: HORT 303.

HORT 451 Plant Improvement (2 lec., 1 lab) (3) (IO) Application of plant breeding techniques and methods of improving crops with special emphasis on Hawaiian plants.

HORT 460 Turfgrass Management (2 lec., 1 lab) (3) (IO) The selection, propagation, establishment and maintenance of turfgrasses with special emphasis on warm season turfgrasses. Limited enrollment. Pre: HORT 262.

HORT 471 Post Harvest Handling (2 lec., 1 lab) (3) (IO) Methods of handling, storing, and shipping of fresh horticultural commodities with emphasis on Hawaiian fruits, vegetables, and ornamental plants. Pre: HORT 262 and CHEM 124.

HORT 481 Weed Science (2 lec., 1 lab) (3) (Y) Classification, identification, and adaptation of weeds. Principles of weed control, including properties, use, and action of herbicides. Pre: HORT 262 or BIOL 175 and one year of chemistry.

INTERDISCIPLINARY STUDIES (IS)

College of Arts and Sciences

IS 199 Directed Studies (1-3) Permission of instructor and statement of planned reading or research required.

IS 201 Pre-Pharmacy Orientation (2) (Y) This course is a requisite for the Pre-Pharmacy Program at UH Hilo. It will familiarize the student with the academic requirements of the Pre-Pharmacy Program and Doctorate of Pharmacy degree. Individual lectures will cover the clinical, technical, and ethical responsibilities of a pharmacist in the 21st century and allow students to become familiar with job opportunities for pharmacists. This course will provide interactions with local pharmacists and doctoral pharmacy students through mentor partnerships. Offered Spring semester only.

IS 299 Directed Studies (1-3) Permission of instructor and statement of planned reading or research required. Pre: sophomore standing.

IS 393 Foreign Field Experience (Arr) (3-15) Academic coursework, research, or internship in foreign locations which may transfer into specific disciplines after its completion.

D = Denmark, E = England, F = France, H = Hong Kong, J = Japan, K = Korea, P = People's Republic of China, R = Republic of China (Taiwan), T = Thailand. Foreign field experiences are not limited to the countries listed. May be repeated for credit.

IS 399 Directed Studies (1-3) Statement of planned reading or research required. Pre: junior standing and consent of instructor.

JAPANESE (JPNS)**College of Arts and Sciences, Languages**

Students who have demonstrated competence in Japanese in high school will not be admitted to JPNS 101 and must take a placement test before enrolling in a course in Japanese.

JPNS 101-102 Elementary Japanese (4-4) Yr. (S) Development of listening, speaking, reading, writing. Structural points introduced inductively. Laboratory drill. (Not more than four credits will be granted for the completion of both JPNS 101 and JPNS 121 at Hawai'i Community College.) (Same as JPST 101-102)

JPNS 201-202 Intermediate Japanese (4-4) Yr. (Y) Continuation of Japanese 102. More advanced colloquial structures and additional *kanji*. Pre: JPNS 102 or equivalent. (Same as JPST 201-202)

JPNS 299 Directed Studies (1-3) Permission of the instructor and statement of planned reading or research required. Pre: sophomore standing.

JPNS 301-302 Third-Year Japanese (3-3) Yr. (Y) Study of modern spoken and written Japanese involving advanced structures, expressions, and *kanji*. Pre: JPNS 202 or equivalent. (Same as JPST 301-302)

JPNS 340 Japanese Composition (3) (AY) Writing compositions using designated patterns, *kanji*, and themes. Pre: JPNS 202 or equivalent. (Same as JPST 340)

JPNS 365 Japanese Literature in English (3) (AY) Survey of major works from earliest times to the present. Knowledge of Japanese is not required. (Same as ENG 365, JPST 365)

JPNS 394 Special Topics in Japanese (1-3) Advanced topics chosen by the instructor. Course content will vary. May be repeated for credit, provided that a different topic is studied. Pre: junior standing and consent of the instructor.

JPNS 399 Directed Studies (1-3) Permission of the instructor and statement of planned reading or research required. Pre: junior standing.

JPNS 401 Fourth-Year Japanese (3) Yr. (Y) Study of modern spoken and written Japanese involving advanced structures, expressions and additional *kanji*. Pre: JPNS 302 or equivalent. (Same as JPST 401)

JPNS 425 Translation Workshop (3) (AY) Theory and practice of translation of Japanese materials into English. Emphasis on literary translation, but non-literary texts may also be considered. Pre: JPNS 302 or consent of instructor. May be repeated once for credit. (Same as JPST 425)

JPNS 451-452 Structure of Japanese (3-3) Yr. (AY) Phonology, morphology, syntax of modern colloquial grammar. Pre: LING 102 and JPNS 202, or consent of instructor. (Same as LING 451-452, JPST 451-452)

JPNS 481 Readings in Modern Japanese Literature (3) Yr. (AY) Reading and discussion in Japanese of selected works of fiction, poetry, and drama. Pre: JPNS 302 or consent of instructor. May be repeated once for credit. (Same as JPST 481)

JPNS 499 Directed Studies (1-3) Permission of the instructor and statement of planned reading or research required. Pre: senior standing.

JAPANESE STUDIES (JPST)**College of Arts and Sciences**

JPST 101-102 Elementary Japanese (4-4) Yr. (Y) Development of listening, speaking, reading, writing. Structural points introduced inductively. Laboratory drill. (Not more than four credits will be granted for the completion of both JPNS 101 and JPNS 121 at Hawai'i Community College.) (Same as JPNS 101-102)

JPST 201-202 Intermediate Japanese (4-4) Yr. (Y) Continuation of JPNS 102. More advanced colloquial structures and *kanji*. Pre: JPNS 102 or equivalent. (Same as JPNS 201-202)

JPST 299 Directed Studies (1-3) (S) Permission of instructor and statement of planned reading or research required. Pre: sophomore standing.

JPST 301-302 Third-Year Japanese (3-3) Yr. (Y) Study of modern spoken

and written Japanese involving advanced structures, expressions, patterns, *kanji*. Pre: JPNS 202 or equivalent. (Same as JPNS 301-302)

JPST 310 History of Japan I: Early Japan (3) (AY) Japanese history and culture from prehistory to the mid-17th century. Topics include: origins of Japanese people and culture; the Imperial state; contacts with China and Korea; aristocratic culture, particularly the role of women; the samurai class and the Shogunates; Buddhism and Shinto; late medieval disorder and development; unification and pacification. (Same as HIST 310)

JPST 311 History of Japan II: Tokugawa to Meiji (3) (AY) Japanese history and culture from the 17th through 19th centuries. Topics include: samurai and the class system; political change, economic growth and social tensions; urban and rural evolution; popular culture and literature; Japan's isolation and reopening; collapse of the Tokugawa system; the Meiji Restoration; dissolution of the samurai class; social reorganization and rapid modernization; the Meiji Constitution and new Imperial state. (Same as HIST 311)

JPST 314 History of Japan III: 20th Century to Present (3) (AY) Japanese history and culture from 1890 to present. Topics include: Meiji and 1947 constitutions; democracy and leadership; militarism and pacifism; evolving Imperial institution; economic growth and social change; tradition and modernity in Japanese culture; Japan's place in world systems and world culture. (Same as HIST 314)

JPST 315 East Asian Religions (3) (AY) The development of Buddhism, Confucianism, Taoism, Shinto and folk religion in China, Korea and Japan. Pre: Junior standing or consent of instructor.

JPST 340 Japanese Composition (3) (AY) Writing compositions employing designated patterns, *kanji*, and themes. Pre: JPNS 202 or equivalent. (Same as JPNS 340)

JPST 353 Politics of Japan (3) (Y) Aspects of Japanese politics, emphasizing the post-1945 period. Topics include political development and change, the political economy of Japan, major political institutions and organizations, policy-making processes, and controversial political issues. (Same as POLS 353)

JPST 356 Japan (3) (Y) Culture origins and development with emphasis on contemporary Japanese culture. (Same as ANTH 356)

JPST 358 Japanese Immigrants (3) (Y) Examination of social and cultural adaptations of Japanese immigrant populations, with foci on Hawai'i and Brazil. Topics include the role of the Japanese government and emigration companies, the factors of generation, kinship, ethnicity, and contemporary Japanese migrants. (Same as ANTH 358)

JPST 365 Japanese Literature in English (3) (AY) Survey of major works from earliest times to the present. Knowledge of Japanese is not required. (Same as JPNS 365, ENG 365)

JPST 375 Japanese Music (3) (AY) Historical survey of traditional, contemporary, and Western-influenced music of Japan and study of major genres. No previous musical knowledge is required. Pre: junior standing or consent of instructor

JPST 380 Japanese Mythology in Film (3) (Y) Interdisciplinary approaches to the study of Japanese myths and legends through contemporary films; mythological contexts related to Taoism, Buddhism, Shintoism as well as superstitions and legends are examined in relation with selected films from Japan. Offered Spring semester only.

JPST 381 Art of Japan (3) (AY) The history of art in Japan with emphasis on Buddhist art, the relationships between Chinese and Japanese arts. No prerequisites necessary for juniors and seniors - others admitted by special permission. (Same as Art 381)

JPST 392 Japanese Women (3) (AY) History of women in Japan from the earliest historical eras, including the Heian aristocracy and evolving samurai culture, through the present. Topics include property rights, family structures, the influence of religion and secular philosophies, effects of political and legal changes, women's role in the economy and its effect on their status and lives, and women's activism. (Same as HIST 392 and WS 392)

JPST 394 Special Topics in Japanese Studies (1-3) Advanced topics chosen by the instructor. Course content will vary. May be repeated for

credit, provided a different topic is studied. Pre: Junior standing and consent of instructor.

JPST 399 Directed Studies (1-3) Permission of the instructor and statement of planned reading or research required. Pre: junior standing.

JPST 401 Fourth-Year Japanese (3) (IO) Study of modern spoken and written Japanese involving advanced structures, expressions and additional *kanji*. Pre: JPNS 302 or equivalent. (Same as JPNS 401)

JPST 425 Translation Workshop (3) (AY) Theory and practice of translation of Japanese materials into English. Emphasis on literary translation, but non-literary texts may also be considered. Pre: JPNS 302 or consent of instructor. May be repeated once for credit. (Same as JPNS 425)

JPST 430 Philosophy of Zen (3) (AY) Chief philosophical teachings of Zen, its methods and cultural influences. Comparative study of Zen and Western thought. Pre: previous work in philosophy or religious studies, or consent of instructor. PHIL 302 is recommended. (Same as PHIL 430)

JPST 450 Mahayana Buddhist Philosophy (3) (AY) Important tenets and major schools of Mahayana Buddhist philosophy in India, China, Japan, Tibet, and Hawai'i. Comparative study of Mahayana and Western philosophy. Pre: previous work in philosophy, religious studies, or consent of instructor. PHIL 302 is recommended. (Same as PHIL 450)

JPST 451-452 Structure of Japanese (3-3) Yr. (AY) Phonology, morphology, syntax of modern colloquial grammar. Pre: LING 102 and JPNS 202, or consent of instructor. (Same as LING 451-452, JPNS 451-452)

JPST 457 Japanese Culture and Communication (3) (AY) This course explores aspects of Japanese communication from cross-cultural perspectives and examines problems in intercultural interactions between Japanese and non-Japanese. Offered Spring Semester only. Same as COM 457.

JPST 481 Readings in Modern Japanese Literature (3) (IO) Reading and discussion in Japanese of selected works of fiction, poetry, and drama. Pre: JPNS 302 or consent of instructor. May be repeated once for credit. (Same as JPNS 481)

JPST 494 Special Topics in Japanese Studies (3) (IO) Advanced topics selected by the faculty in Japanese Studies.

JPST 499 Directed Studies (1-3) Permission of the instructor and statement of planned reading or research required. Pre: senior standing.

KE'ELIKŌLANI ANTHROPOLOGY, EDUCATION & INDIGENOUS STUDIES

Built upon a core commitment to Hawaiian language and culture education, Ka Haka 'Ula O Ke'elikōlani provides courses that also address the broader world of indigenous peoples and the use of Hawaiian as an official medium of education for the State of Hawai'i. Courses other than Hawaiian language (HAW) and Hawaiian Studies (HWST) are marked with an initial K (for Ke'elikōlani) followed by an appropriate alpha, e.g. IND (Indigenous Studies), ANT (Anthropology), ED (Education), etc.

KANT 486 Mo'omeheu Hawai'i i Ku'una (3) (Y) Traditional Hawaiian culture in the 18th and early 19th centuries: fishing and farming, political-economic organization, and religion. Conducted in Hawaiian. Based on reading Malo's Ka Mo'olelo Hawai'i. Pre: HAW 303 or equivalent.

KED 463 Substitute Teacher Seminar for a Maui Ola Setting (1) Preparation to teach in a Hawaiian medium environment as a substitute teacher. Content includes the completion of Hawai'i State requirements for substitute teacher certification, basic classroom management, lesson design and delivery, learning and implementation of policies and procedures to be employed as a substitute in Hawai'i's DOE schools. Must be taken credit/no credit. Conducted in Hawaiian. Offered in summer.

KIND 240 Culture Revitalization Movements (3) (Y) Efforts throughout the world to preserve the linguistic and cultural distinctiveness of indigenous and regional minorities. The interrelationship of such efforts with political, cultural, educational, and economic structures. Focus on comparison of other movements with that of Hawai'i. (When followed by H, taught through Hawaiian.)

KINESIOLOGY AND EXERCISE SCIENCE (KES)

College of Arts and Sciences

KES 101 Physical Fitness (1) (S) Conditioning exercises and activities to develop and maintain physical efficiency. Motor fitness tests administered to measure status and progress.

KES 103 Swimming: Beginning (1) (Y) Adjusting to water, immersing in water, floating, sculling, correct arm stroke, leg kick, breathing techniques and their coordination.

KES 104 Swimming: Intermediate (1) (Y) Perfecting and integrating basic strokes with added emphasis on swimming for distance and speed.

KES 105 Open Water Scuba Certification (1) (IO) The science and physiology of SCUBA diving. Explores the theory and practice of underwater diving. Commonly used equipment and safety considerations covered. Includes in-class instruction, underwater pool diving experience and open water ocean diving. Students who successfully complete the course will receive PADI Open Water Diver certification. Pre: No less than a 3.0 average in all UH Hilo courses, a certification from a physician and permission of the instructor. May be taken only once. Additional charges for equipment rental and underwater diving may be incurred.

KES 107 Tennis: Beginning (1) (S) Rules, etiquette, grip, forehand and backhand strokes, serving, volleying, singles and doubles play.

KES 108 Tennis: Advanced (1) (S) Improving the serve, forehand and backhand strokes, volleying, chop strokes, competitive strategy, problems in rules.

KES 110 Golf: Beginning (1) (S) Rules, etiquette, and skill (grip, stance, stroke) in using the irons, woods, and putter. Driving range and play on golf course require additional fees.

KES 117 Mountain Biking (1) (S) Basic knowledge and skills of mountain biking. Emphasis will be placed on the safe operation and maintenance of the bike for recreational purposes. Uses such as commuting and racing will be discussed.

KES 120 Badminton (1) (Y) Rules, etiquette, grip, forehand and backhand strokes, serving, smash, drive, netplay, offensive and defensive strategy in singles and doubles play.

KES 134 Volleyball: Beginning (1) (Y) Rules, fundamental skills of passing, setting, hitting, blocking, digging, and team strategies.

KES 136 Team Sports (1) (Y) Skills, knowledge, attitudes and appreciation. Combination of soccer and softball.

KES 138 Basketball: Beginning (1) (Y) Rules, etiquette, skills in footwork, body balance, passing, shooting, dribbling, rebounding, individual and team strategies, and plays.

KES 152 Weight Training (1) (S) Fundamental techniques of weight training which includes safety and precautions, diet and nutrition, basic weight training principles and individualized exercise programs for total physical fitness.

KES 194 Special Topics in Health (1-3) (IO) Activity and Physical Education topics chosen by instructors. Course content will vary. May be repeated for credit, provided that a different topic is studied.

KES 199 Directed Studies (1-3) Statement of planned reading or research and consent of instructor required.

KES 201 School Health Problems (2) (Y) Responsibilities of the elementary school teacher in recognizing and meeting pupil's needs, teacher's role in health instruction, health services, healthful school living, school health policies.

KES 204 Introduction to Coaching Athletics (2) (Y) Nature, responsibilities, personal and professional requirements of a coach. Scientific principles applicable to coaching methodology and athletic competition.

KES 206 Basic Human Movement (3) (Y) Developing skills to understand the nature and function of human movement in every day life, sport, dance, physical education, and adapted movement activities.

- KES 207 Basic Human Nutrition (3) (Y)** Fundamental principles of normal nutrition and the importance of nutrition in promoting growth and health.
- KES 208 Elementary Tests and Measurements (3) (Y)** Basic understanding and appreciation of the why and how of testing in health, physical education, and athletics. The development and evaluation of neuromuscular and organic abilities and the handling of test data by elementary statistical methods will be covered.
- KES 232 Safety Procedures and Accident prevention (2) (Y)** Understanding the fundamental principles and techniques of safety and accident prevention in school, home, work, motor vehicle, and recreational situations.
- KES 233 Physical Education: Elementary (3) (S)** Content and methods for physical education in elementary school. Selection, planning, teaching, evaluation of movement skills, and activities. Pre: Junior standing.
- KES 234 Care and Prevention of Athletic Injuries (3) (Y)** Fundamentals in athletic training and sports medicine designed to introduce principles and concepts in prevention and treatment of sports-related injuries. Additional fees required.
- KES 263 Intramural Athletics (2) (Y)** The organization, administration, and supervision of intramural sports programs in schools with emphasis on leadership, program content, facilities, scheduling, rules and regulations, promotion, financing, and evaluation.
- KES 294 Special Topics in Health and Physical Education (1-3) (IO)** Topics chosen by instructors. The course content will vary. It may be repeated for credit, provided that a different topic is studied.
- KES 299 Directed Studies (1-3)** Statement of planned reading or research and consent of instructor required.
- KES 300 Psycho-social Aspects of Sport (3) (Y)** The functions and dysfunctions of the sporting system will be examined from sociological perspectives. In addition, specific psychological constructs are presented in order to examine the relationship between environmental sources of influence and the individual's capacity for self-management in the sporting world.
- KES 306 Advanced Human Movement (3) (Y)** The advanced skills necessary to understand the nature and function of human movement in every day life, sport, dance, physical education and adapted movement activities. Pre: KES 206.
- KES 308 The Science Behind the Training of Athletes (3) (AY)** Basic understanding of training theory and the physiological and biomechanical factors that determine muscle strength and conditioning progression, including timing in training, factors in exercise selection, and injury prevention.
- KES 310 Basic Motor Learning (3) (AY)** Basic understanding of the principles of motor learning and performance in a variety of contexts including teaching, coaching, design of performer-friendly equipment and work environments, and everyday motor skill learning.
- KES 320 Drug Awareness (3) (S)** For students interested in the prevention and treatment of victims of legal and illegal use, misuses, and abuse of drugs and related substances. Examines the problems and consequences of people who have to deal with this dilemma.
- KES 330 Applied Motor Learning (3) (AY)** Applying the principles of motor learning in different contexts such as teaching, coaching, design of performer-friendly equipment and work environments, rehabilitation, and everyday motor skill learning. Developing of motor learning programs. Pre: KES 310.
- KES 334 Advance Care and Prevention of Athletic Injuries (3) (Y)** An in-depth understanding and appreciation of the prevention, management, and care of athletic injuries. Application of tape and braces for prevention and management of injuries and first aid and CPR certification will also be covered. Pre: KES 234, BIOL 243-244 and BIOL 243-244L.
- KES 343 Musculoskeletal Anatomy (3) (Y)** Basic understanding of human anatomy from the perspective of movement, with emphasis on the skeletal and muscular systems. Pre: BIOL 243-244 and BIOL 243L-244L.
- KES 344 Musculoskeletal Physiology (3) (S)** Basic understanding of human musculoskeletal physiology from the perspective of internal function, with emphasis on aerobic and anaerobic metabolism during muscular function. Pre: KES 343
- KES 348 Exercise Physiology (3) (Y)** Basic understanding of human physiology and its response to exercise and adaptations to various types of training. Physiological systems are reviewed as they respond to acute bouts of exercise and long-term exposure to exercise. Pre: BIOL 125.
- KES 370 Sport Psychology (3) (Y)** Survey of methods and findings in the application of psychological principles in sport. Topics include arousal and anxiety, cognitive processes, team performance, coaching behavior and techniques to maximize sports performance. (Same as PSY 370)
- KES 380 Applied Sport Psychology (3) (AY)** Based on the principles of sport and exercise psychology. The course will focus on methods and programs applying sport psychology in the field of health and physical education to enhance performance, adhere people to physical exercise programs, and support the overall well-being. Pre: KES/PSY 370.
- KES 394 Special Topics in Health and Physical Education (1-3) (IO)** Advanced topics chosen by the instructor. The course content will vary. Course may be repeated for credit, provided that a different topic is studied. Pre: KES 206.
- KES 399 Directed Studies (1-3)** Statement of planned reading or research and consent of instructor required.
- KES 440 Physiology of Aging (3) (AY)** Study of the physiological mechanisms and effects of aging on the human systems including the cardiopulmonary, musculoskeletal, neurological, sensory, metabolic, and endocrinological. This course will present the topic of physiology of exercise and aging.
- KES 443 Adapted Physical Education (3) (Y)** Understanding the basics of various disabilities, how to assess the physical and motor skills of the disabled and how to develop individualized activity programs for children and youth with disabilities. How to effectively relate and deal with public and private agencies will also be covered. Pre: KES 206, 306, 343, 344.
- KES 494 Special Topics in Health and Physical Education (1-3) (IO)** Advanced topics chosen by the instructor. The course content will vary. Course may be repeated for credit, provided that a different topic is studied. Pre: KES 206 and junior standing.
- KES 499 Directed Studies (1-3)** Statement of planned reading or research and consent of instructor required.

LINGUISTICS (LING)

College of Arts and Sciences

- LING 102 Introduction to Linguistics (3) (Y)** A broad introduction to general linguistics: survey of phonology, morphological, syntactic, and semantic analysis, and historical and comparative linguistics. (Formerly LING/ENG 203).
- LING 121 Introduction to Language (3) (S)** Linguistically oriented approaches to human behavior, including ethnolinguistics, sociolinguistics, and psycholinguistics. The way language functions in culture, society, and the cognitive processes. (Same as ANTH 121)
- LING 299 Directed Studies (1-3)** Statement of planned reading or research required. Pre: sophomore standing and consent of instructor.
- LING 311 Phonetics and Phonology (3) (AY)** Provides a conceptual framework and practical skills to engage in work in phonetics and phonology. Course includes training in the production and perception of speech sounds, as well as the physiological and acoustic description of them. Students learn IPA transcription symbols and practice analyzing phonological data based on the languages of the world. Pre: LING 102 or 121 or consent of instructor.
- LING 320 History of the English Language (3) (AY)** The major developments in the English language from the 5th century to the present day. Pre: ENG/ESL 100, LING 102 or LING 121, or consent of instructor. (Same as ENG 320)

- LING 321 Morphology and Syntax (3) (IO)** Introduction to grammatical analysis and theory; practical experience in solving problems in morphology and syntax, using data drawn from a wide variety of languages. Pre: LING 102 or consent of instructor. (Same as ANTH 321, ENG 321)
- LING 324 Modern English Grammar and Usage (3) (IO)** The fundamentals of English morphology and syntax, conventions of written and spoken English, and sociolinguistic aspects of major English registers and dialects. Pre: ENG/ESL 100, LING 102 or LING 121, or consent of instructor. (Same as ENG 324)
- LING 331 Language in Culture and Society (3) (AY)** An examination of the articulation of language in social and cultural context, including topics relevant to sociolinguistics and ethnolinguistics. Pre: ANTH/LING 121 or LING 102 or consent of instructor. (Same as ANTH 331)
- LING 333 Psycholinguistics (3) (AY)** Theory and method in the investigation of the relationship between language and cognition, first- and second-language acquisition, speech pathologies. Pre: LING 102 OR PSY 100 or consent of instructor. (Same as PSY 333)
- LING 344 Children and Language (3) (AY)** Strategies of language acquisition used by children; emphasis on investigative skills and methods, including some field work. Recommended prerequisite: LING 102 or LING 121. (Same as ENG 344)
- LING 345 Historical and Comparative Linguistics (3) (Y)** This course provides an introduction to the principles of historical linguistics beginning with a survey of the features of the world's language families. A problem-solving approach is adopted as students learn the comparative method of reconstruction and actually engage in the linguistic reconstruction of protolanguages. Offered Fall semester only, beginning Fall, 2007.
- LING 347 Pidgins and Creoles (3) (Y)** A study of the world's pidgins and creole with special reference to the Pacific region; the origin and nature of pidgins and creoles; the relationship of Hawaiian Creole English to other creoles in the world; the link between the development of a creole and language acquisition. (Same as ANTH 347, ENG 347; recommended LING 102 or 121)
- LING 350 Second Language Acquisition Theory (3) (AY)** Current research and theories of learning a second language or additional language from social, psychological and linguistic perspectives. Topics include the attainment of communicative competence, the critical period hypothesis, focus on form, individual learning styles, and learner autonomy. The emphasis is on how the knowledge of second language acquisition theory helps improve the quality of classroom language teaching. Pre: LING 102 or consent of instructor. (Same as ENG 350)
- LING 351 Methodology of Foreign Language Teaching (3) (IO)** Foreign language teaching and learning from the perspectives of theory and practice. The application of modern linguistics to specific problems confronting the teacher. Pre: LING 102 or consent of instructor.
- LING 356 Language and Gender (3) (AY)** Students engage in the analysis of gender as it relates to language and society. Provides students with analytic resources for thinking critically about the relationship between language and social practice. Students gather and analyze data based on current theories. Pre: ENG 100/ESL 100 and LING 102 or consent of instructor. (Same as WS 356, ENG 356)
- LING 399 Directed Studies (1-3)** Statement of planned reading or research required. Pre: Junior standing and consent of instructor.
- LING 410 Semantics and Pragmatics (3) (IO)** Introduction to the fundamentals and modern theories of meaning, reference and the relations between language and knowledge of the world. Ways in which the interpretation of sentences in natural languages depends upon the literal meaning of propositions and their logical (semantic) and contextual (pragmatic) inferences. Pre: LING 102 or consent of instructor.
- LING 451-452 Structure of Japanese (3-3) Yr. (AY)** Phonology, morphology, syntax of modern colloquial grammar. Pre: LING 102 and JPNS 202 or consent of instructor. (Same as JPNS and JPST 451-452)
- LING 453 Hawaiian Phonetics and Phonology (3) (AY)** Sound system of the Hawaiian language. Stylistic and regional variation. Interaction of the Hawaiian sound system with the sound systems of other languages, especially that of English. Conducted in Hawaiian. Pre: HAW 202, which may be taken concurrently, or equivalent; LING 102, LING 211, LING 311 recommended. (Same as HAW 453)
- LING 454 Hawaiian Morphology and Syntax (3) (AY)** Grammatical system of the Hawaiian language. Conducted in Hawaiian. Pre: HAW 202, which may be taken concurrently, or equivalent; LING 102 recommended. (Same as HAW 454)
- LING 455 Hawaiian: A Polynesian Language (3) (AY)** The similarities and differences among Polynesian languages and the reconstruction of their common ancestor language. The development of Hawaiian from that common ancestor. Conducted in Hawaiian. Pre: HAW 303, which may be taken concurrently, and HAW 453 or LING 102; HAW 454, LING 371 recommended. (Same as HAW 455)
- LING 494 Special Topics in Linguistics (1-3) (IO)** Advanced topics chosen by the instructor. Course content varies from semester to semester and the course may be repeated for credit, provided that a different topic is studied. Pre: junior or senior standing and consent of instructor.
- LING 499 Directed Studies (1-3)** Statement of planned reading or research required. Pre: senior standing and consent of instructor.

MANAGEMENT (MGT)

College of Business and Economics

- MGT 235 Planning, Process and Structure in Electronic Business (3) (AY)** Issues in the management of businesses intending to engage in electronic commerce (EC). Topics include the forms, structures, internal processes, and organizational behaviors likely to be exhibited by e-businesses, and how e-businesses may differ from traditional businesses in these respects. Case studies will be used extensively to explore these issues. Also examined are startup and planning requirements for EC managers and entrepreneurs (netpreneurs).
- MGT 300 Management, Organizations and Human Behavior (3) (S)** Survey of classical and modern management theory and practice. Management implications of organization theory. Basic concepts in work motivation, communication, group dynamics, leadership, organizational change, conflict, personality, and leadership. Pre: Admission to Professional Business Program, COM 251 and ENG 209.
- MGT 330 Human Resource Management (3) (Y)** The contemporary theory and practice relating to the management of human resources: recruiting, selection, psychological testing, interviewing, job evaluation, performance review, training and development, wage and salary administration, benefit and service programs, and labor-management relations. Pre: Admission to Professional Business Program, MGT 300 and junior standing.
- MGT 332 Organizational Behavior and Management (3) (Y)** The human relations movement; basic concepts in behavior pertaining to organizations including personality, motivation, leadership, communication, change, conflict, and group dynamics. Course includes the relationship of these concepts to performance, job satisfaction and organizational commitment. Pre: Admission to Professional Business Program, COM 251 and ENG 209.
- MGT 333 International Business Management (3) (S)** Provides a systematic introduction to international business management, drawing examples from Pacific Rim business and commerce. Course introduces multinational marketing and international aspects of personnel management, plus introductory material on international business financial transactions. Pre: Admission to Professional Business Program, ECON 131 and MGT 300.
- MGT 379 History of Entrepreneurship in America (3) (AY)** The role of entrepreneurship in developing the American business system from its European origins to its current global manifestations and its future prospects. Focus on the values, characteristics, and practices of entrepreneurs and on the changing relations over time between business labor and government. (Same as HIST 379)
- MGT 399 Directed Studies (1-3)** Statement of planned reading or research required. Pre: Admission to Professional Business Program, junior standing and consent of instructor.

MGT 423 Business and Society (3) (S) Impact of business on society and the impact of the societal environment on business operations and decision making. Pre: Admission to Professional Business Program, BUS 240 and MGT 300 or consent of instructor. (PHIL 323 may be substituted for this course in the professional core.)

MGT 425 Business Planning for New Ventures (3) (Y) Development of a business plan for a new venture with attention to form of business organization; competitive advantage; accounting systems and controls; financial, marketing, human relations, operations and risk management; government regulation and compliance; social responsibility. Identification of sponsors and sources of help for small business. Pre: Admission to Professional Business Program, COM 251, ENG 209 and ECON 130 or BUS 100.

MGT 430 Labor Relations and Collective Bargaining (3) (AY) History, structure, current state, and future of organized labor in the U.S. Legal issues surrounding collective bargaining and labor agreements. Processes of collective bargaining and labor contract administration. Grievance systems, arbitration, and other forms of dispute resolution. Economic issues under collective bargaining. Pre: Admission to Professional Business Program, MGT 300.

MGT 490 Strategic Management (3) (S) Integrative capstone course using concepts of strategy formulation, competitive analysis, and strategy implementation as models for problem solving and decision making in an organizational setting. Computer software applications are used to aid in comprehensive case analysis. Pre: Admission to Professional Business Program, MGT 300, MKT 310, FIN 320, QBA 361 and senior standing.

MGT 491 Small Business Consulting (3) (AY) Development of a consulting report for a local small business. Student is assigned to a consulting team and a local small business or community organization. Each consulting team will produce a consulting report that identifies major issues facing the client organization and an action plan designed to address these issues and improve competitive position. In addition to the written report, each team is required to make an oral presentation of findings. Compliance with a binding non-disclosure agreement is required. Pre: Admission to Professional Business Program, MGT 300, MKT 310, FIN 320, QBA 361 and senior standing.

MGT 494 Special Topics in Management (1-3) Advanced topics chosen by the instructor. The course content will vary. It may be repeated for credit, provided that a different topic is studied. Pre: Admission to Professional Business Program, varies with topic.

MGT 499 Directed Studies (1-3) Statement of planned reading or research required. Pre: Admission to Professional Business Program, senior standing and consent of instructor.

MARINE SCIENCE (MARE)

College of Arts and Sciences

MARE 100 Marine Option Program Seminar (1) (Y) Orientation to the Marine Option Program with statewide overview of ocean issues and the organizations involved with marine activities, management, education, research and business. Exploration of opportunities for internships, research projects, independent study and careers. Portions on HITS with participation of students and faculty from throughout the UH system. CR/NC only.

MARE 101L Introduction to Marine Science Field Laboratory (2) (Y) (Summer Only) A basic introduction to field techniques in marine science including: the use of marine charts, measuring bathymetry, marine sediment sampling, techniques for measuring salinity, temperature, and ocean circulation, plankton sampling and identification, marine fishes and invertebrates, and marine wildlife management techniques used in tagging sea turtles. Field trips required.

MARE 110 Current Issues in Marine Science (3) (S) Introduction to marine science via the controversies and problems facing our ocean environment. Topics may include coastal population growth, sonar, fisheries, dolphin-safe tuna, cruise ship waste, global warming, mercury in fish, beach erosion, alien species, and coral reef decline. **Designed for non-majors. This course satisfies CAS general education requirements in the Natural Sciences.**

MARE 140 Introduction to Hawaiian Coral Reefs (3) (S) Explore the underwater world of the Big Island of Hawaii while learning about unique marine ecosystems found nowhere else on Earth. Students will acquire an appreciation for local aquatic fauna in the classroom including the basics of marine biology and natural history. Concurrent enrollment in MARE 140L required.

MARE 141L Introduction to Hawaiian Coral Reefs Laboratory (1) (S) Students will enter the natural laboratory that is Hawaii and investigate coral reefs, coastal beaches, and tide pool systems with mask, snorkel, and fins. Students will learn to identify common marine inhabitants while enjoying an unparalleled educational experience under the sea. A \$250 lab fee is payable upon registration. Concurrent enrollment in MARE 140 is required.

MARE 156 Natural History & Conservation - Hawaiian Islands (3) (Y) The formation of the Hawaiian Islands, establishment of their native terrestrial and marine flora and fauna, and human impacts and conservation. (Same as BIOL 156)

MARE 156L Natural History Field Trips (1) (Y) Field trips for Natural History and Conservation Hawaiian Islands. (Same as BIOL 156L)

MARE 171 Marine Biology - Diversity (3) (S) Marine organisms: classification, structure, physiology, ecology and adaptations to the marine environment. This course satisfies CAS general education requirements in the Natural Sciences. Pre: Two high school or college science courses, or consent of instructor.

MARE 171L Marine Biology Laboratory (1) (S) Provides students with direct exposure to the biota of Hawai'i via laboratory work and field trips to sites around Hilo. The course focuses on the identification, natural history, and ecology of common marine organisms. Pre: current or previous enrollment in BIOL/MARE 171. (Same as BIOL 171L)

MARE 172 Marine Biology - Cellular Processes (3) (S) Introduction to the fundamentals of biology as they pertain to marine organisms. Principles of cell biology, molecular biology and biochemistry. Focuses are biological molecules, prokaryotic and eukaryotic cell structure and function, basic metabolism, and cellular processes. Emphases will be given to cellular level adaptations to marine environment. Pre: high school Biology or BIOL 101 and high school chemistry or CHEM 114 recommended.

MARE 190 Hawaiian Marine Field Experience (2) (Y) (Summer Only) Provides a unique opportunity for students to experience the marine environment of the Big Island. Course consists of field trips to coastal and underwater sites around the island. Some swimming and snorkeling involved but not required. (Same as BIOL 190)

MARE 194 (A-Z) Special Topics in Marine Science (1-3) (S) Topics chosen by the instructor. The course content will vary. It may be repeated for credit, provided that a different topic is chosen. Pre: Varies with topic.

MARE 201 Oceanography (3) (S) Geological, chemical, physical and biological aspects of the ocean; structure, formation, and features of ocean basins; seawater's properties and their distribution; currents, waves, tides; characteristics of marine organisms; marine ecological principles. Pre: Two high school or college science courses recommended.

MARE 201L Oceanography Laboratory (2) (S) The basic techniques of oceanography including: marine charts and navigation, bathymetry, marine sediments, techniques for measuring salinity, temperature, dissolved oxygen, and surface and deep circulation, light and sound in seawater, wave dynamics, tides, plankton sampling and identification. In-class field trips required. Pre: concurrent or previous enrollment in MARE 201.

MARE 240 Small Boat Operations in Research (3) (S) This course is intended to provide the novice boater with the skills needed to safely operate and conduct research from a small boat. Topics include state and federal regulations, safety, navigation, small boat handling, and conducting research operations. The course will consist of lectures, lab sessions, and time on the water in a small boat. Participants must be able to swim. Admission by advance consent of the instructor.

MARE 250 Statistical Applications in Marine Science (3) (S) Hands-on approach to the design of field experiments, collection of ecological

- data, analysis of data on microcomputers using statistical methods, and presentation of results. Requires completion of an independent project using data collected in the field followed by the preparation of both written and oral reports. Pre: MARE/BIOL 171 or MARE 201; and CS 102 or placement by exam, or consent of instructor. (Same as BIOL 250)
- MARE 264 Quantitative Underwater Ecological Survey Techniques (QUEST) (3) (Y) Summer Only** The application of commonly utilized nearshore underwater ecological surveying techniques using SCUBA. Intensive two-week course combining lecture and field work. Data will be collected in the field, reduced, analyzed and presented in an oral report. Pre: authorization as a scientific diver in training before start of course, and consent of instructor.
- MARE 265 Marine Ecology and Evolution (3) (S)** Principles of ecology and evolution for Marine Science majors stressing integrated approach and recent advances. Topics include but are not limited to evolutionary mechanisms, macroevolution, systematics and origin of life, population and community ecology and ecological processes, marine communities, dispersal, biodiversity, and biogeography. Pre: MARE 171/171L, MARE 172, and MARE 201 or consent of instructor.
- MARE 282 Global Change (3) (Y)** Principal components of global change and impacts on the marine environment. Course focuses on the interdisciplinary nature of global change and interrelationships to biological, physical, anthropological, economic, and political concepts. Pre: college-level science course.
- MARE 282L Global Change Laboratory (1) (IO)** Elements of global change in the physical, chemical and biological properties of the Hawaiian Islands using laboratory exercises and field trips. Involves shipboard water sampling and analysis, snorkeling on coral reefs, and hiking in rain forests. Pre: previous or concurrent enrollment in MARE 282.
- MARE 294 Special Topics in Marine Science (1-3) (S) (Summer)** Topics chosen by the instructor. The course content will vary. It may be repeated for credit, provided that a different topic is chosen. Pre: Varies with the topic.
- MARE 299V Directed Studies (1-3)** Statement of planned reading or research required. Pre: sophomore standing and consent of instructor.
- MARE 301L Advanced Oceanography Laboratory (2) (Y) (Summer Only)** Analysis of mero/holoplanktonic composition and density in east Hawaiian waters, *in situ* quantification of piscine agonistic and feeding behavior, territory mapping using a common herbivorous pomacentrid fish, sea turtle population evaluation via Schnabel analysis, use of satellite-based navigation systems, computer controlled bathymetric profiling, marine sedimentation and turbidity monitoring, thermohaline circulation profiling by CTD, Eulerian and Lagrangian techniques.
- MARE 310 The Atoll Ecosystem (3) (Y)** Formation, structure, distribution, oceanography, biota and ecology of atolls. Human interactions, historical and modern, with atoll ecosystems. Atoll resource management issues and actions. Pre: MARE/BIOL 171, MARE 201, or BIOL 156 or consent of instructor.
- MARE 325 Coral Reef Ecology (3) (Y)** Provides a background in evolutionary and natural history of tropical reefs, coral reef community structure and interactions, and coral reef ecosystem processes/functions. Student will learn ecology of Hawaiian and global coral reefs. Student will review information on the increasingly important conservation issues related to tropical reef systems and review present management strategies employed. Pre: MARE 265 or consent of instructor. Offered in Spring Semester only.
- MARE 350 Coastal Methods and Analyses (3) (Y)** Planning of field and laboratory data collection and experimentation in the coastal environment. Course covers hypothesis development, experimental design, statistical analyses of data, data interpretation, scientific writing, and presentations. Pre: Junior standing; BIOL/MARE 250; MARE 201; MARE 265; CHEM 125. Must be taken concurrently with MARE 350L. Offered Fall Semester only.
- MARE 350L Coastal Methods and Analyses Lab (2) (Y)** Implementation of field and laboratory data collection and experimentation in the coastal environment. Techniques include measuring geological, chemical, and physical coastal properties; estimating the abundance and diversity of plankton, nekton, and benthos; and use of modern data recording and analyzing systems. Pre: Junior standing; BIO/MARE 250, CHEM 125, MARE 201, MARE 265. Must be taken concurrently with MARE 350. Offered Fall semester only.
- MARE 353 Pelagic Methods and Analyses (3) (Y)** Planning of field and laboratory data collection and experimentation in the neritic and pelagic marine environment from an oceanographic vessel platform. Course covers hypothesis development, experimental design, statistical analyses of data, data interpretation, scientific writing, and presentations. Pre: Junior standing; MARE 201, BIOL/MARE 250; MARE 265; CHEM 125. Must be taken concurrently with MARE 353L. Offered Spring Semester only.
- MARE 353L Pelagic Methods and Analyses Lab (2) (Y)** Implementation of field and laboratory data collection, and experimentation in the neritic and pelagic marine environment from an oceanographic vessel platform. Techniques include measuring geological, chemical, and physical properties; estimating the abundance and diversity of plankton, nekton, and benthos; and use of modern data recording and analyzing systems. Pre: Junior standing; MARE 201, BIOL/MARE 250; MARE 265; CHEM 125. Must be taken concurrently with MARE 353L. Offered Spring Semester only.
- MARE 360 Marine Resources (3) (IO)** A survey of human use of the marine environment including physical and biological resources. Topics covered include: fisheries, mariculture, marine mineral and energy resources, chemical resources of sea water, the use of coastal lands and waste disposal in the sea. Pre: MARE 201 or BIOL/MARE 171, or consent of instructor. (Same as BIOL 360)
- MARE 364 Advanced QUEST (3) (Y) (Summer Only)** Students lead a dive team learning underwater ecological surveying techniques; supervise field data collection, data reduction and analysis, and team presentation of written and oral reports; and assist in training students in identification of marine organisms. Pre: BIOL/MARE 264, authorization as a scientific diver in training before start of course, and consent of instructor. Students receive CR/NC for the course. as
- MARE 366 Tropical Marine Research Investigations (3) (Y) (Summer Only)** Research projects on marine-related problems. Students will do a literature search; develop experimental design; collect, reduce and analyze data; do a written final report; and present findings at a symposium. Projects will be selected from a list of topics or can be original with the consent of the instructor. Pre: consent of instructor. (Same as BIOL 366)
- MARE 371 Biology of Marine Invertebrates (3) (Y)** A survey of the major groups of invertebrates focusing on those dominant in the marine environment. Students will learn methods used to identify and classify invertebrates and will survey the anatomy, physiology, and natural history of the major groups. Pre: MARE 265 or BIOL 176 or their equivalent, concurrent enrollment in MARE 371L. (Same as BIOL 371)
- MARE 371L Biology of Marine Invertebrates Laboratory (1) (Y)** Direct exposure to the major groups of invertebrates in the marine environment, focusing on those present in Hawai'i. Students will learn to identify and classify invertebrates and will survey the anatomy and natural history of the major groups. Pre: concurrent or previous enrollment in BIOL/MARE 371. (Same as BIOL 371L)
- MARE 372 Biology of Marine Plants (3) (Y)** Diversity, distribution and ecology of marine macroalgae and seagrasses. Students will learn methods to identify common marine plants of the Hawaiian Islands and the tropical Pacific. Marine plants and their relation to human affairs will be discussed. Pre: MARE/BIOL 171 or BIOL 175 or consent of instructor; concurrent enrollment in MARE 372L. Offered in Spring Semester only.
- MARE 372L Biology of Marine Plants Laboratory (1) (Y)** Laboratory activities relating to the taxonomy, biology, chemistry, physiology, and human uses of seaweeds and seagrasses. Includes field trips. Pre: Concurrent enrollment in MARE 372. Offered in Spring Semester only.
- MARE 390 Biology of Marine Mammals (3) (Summer)** Comprehensive investigation of a diverse group of highly adapted marine vertebrates. Whales, dolphins, porpoises, seals, sea lions, walrus, manatees, dugongs, sea otters, and polar bears will be covered. Focus will be on

- taxonomy, anatomy and physiology, behavior, reproductive ecology, adaptations to the marine environment, and conservation and management. Pre: MARE 171 or consent of instructor.
- MARE 390L Biology of Marine Mammals Laboratory (1) (Summer)** Field and lab techniques employed by professional marine mammal biologists including shore and boat-based surveys, photo-identification, and acoustic sampling. Investigations will focus on local species of marine mammals. Pre: Concurrent or previous enrollment in MARE 390.
- MARE 394 Special Topics in Marine Science (1-3) (S) (Summer)** Advanced topics chosen by the instructor. The course content will vary. It may be repeated for credit, provided that a different topic is chosen. Pre: Varies with topic.
- MARE 399V Directed Studies (1-3)** Statement of planned reading and research required. Pre: junior standing and consent of instructor.
- MARE 425 Chemical Oceanography (3) (Y)** Chemical processes occurring in marine and estuarine waters and their impact on the nearshore and oceanic environments. Topics include: salinity, chlorinity, major and minor elements, and dissolved gasses in seawater; macro and micronutrients, dissolved and particulate organic matter; geochemistry of marine sediments; and radiometric dating and stable isotopes as water mass tracers. Pre: CHEM 125, MARE 201.
- MARE 434 Teaching Marine Science (3) (AY)** Marine science concepts and teaching strategies for pre-service and inservice teachers. Includes geological, chemical, physical and biological topics. Pre: MARE/BIOL 171, MARE 201, and MARE 265.
- MARE 435 Marine Field Experience for Teachers (3) (AY)** Training for pre-service and inservice teachers in marine science field experiences content and strategies. Includes geological, chemical, physical and biological topics. Pre: MARE/BIOL 171, MARE 201, and MARE 265..
- MARE 440 Physical Oceanography (3) (Y)** Topics in physical oceanography include: distribution of water characteristics in the ocean; dynamics of circulation and water masses; wave characteristics including formation, propagation, dispersion and refraction; dynamic and equilibrium theories of tides as well as tsunami, seiche, and internal waves; sound and optics; and the latest methods and instrumentation in physical oceanography. Pre: MARE 201; MATH 205 (and 206 recommended); PHYS 170/170L (or PHYS 106/170L and consent of instructor).
- MARE 444 Biological Oceanography (3) (Y)** This course focuses on the interaction of phytoplankton, zooplankton, and pelagic organisms in the open ocean environment. Students will learn aspects of plankton taxonomy, physiology, and pelagic population dynamics. Students will survey the current research status of the field using primary literature. The student's knowledge will then be applied to the study of local and global productivity and trophodynamics. Pre: Junior standing and MARE 265 and CHEM 125, or consent of instructor.
- MARE 445 Marine Microbial Ecology (3) (Y)** Marine microorganisms in a diversity of roles within the marine environment including microbial food webs, biogeochemical cycling, symbioses as well as hot-pathogen interactions, extreme environments and bioremediation. Microbial interactions in tropical and temperate systems are presented. Pre: MARE 265 or consent of instructor.
- MARE 460 Marine Conservation (3) (Y)** Concepts and issues in marine conservation ecology and marine resource management. Topics include resource exploitation, invasive species, eutrophication, marine pollution, and global climate change. Ecological impacts of resource depletion, environmental modification, and biodiversity loss will be discussed along with methods used to address impacts. Pre: MARE 265 or consent of instructor. Fall Semester only.
- MARE 461 Geological Oceanography (3) (Y)** A detailed study of the ocean floor to include marine stratigraphy, plate tectonics, oceanic sediments and paleoceanography. Pre: MARE 201, GEOL 111, and one of CHEM 124, 125 or MARE 440; or consent of instructor.
- MARE 470 Senior Thesis Research (3) (Y)** Practical experience in designing and completing a marine-related research project. Students will submit project proposals for evaluation and approval. Once approved, students will do a thorough literature review, develop an experimental design, and collect and record data, and present preliminary results. Pre: MARE 265; MARE 350 or MARE 353; and ENG 225 or consent of the instructor.
- MARE 471 Senior Thesis Report (3) (Y)** Second-semester continuation of MARE 470. Students finish their research projects no later than six weeks into the semester. Following data reduction and analysis, a final written report will be prepared. Students will also present 15-minute seminar presentations on the results of their projects. Pre: MARE 470 and consent of instructor.
- MARE 480 Senior Internship (3) (Y)** Applications of knowledge and skills in a public, private, or government agency involved in marine science education or research. Pre: junior or senior class standing, consent of instructor and preapproved placement.
- MARE 484 Biology of Fishes (3) (Y)** The biology of marine and freshwater fishes. Topics covered include: general anatomy, locomotion, respiration, osmoregulation, sensory systems, reproduction, electro-sensitive and electrogenic fishes, coloration and bioluminescence in fishes, migratory patterns, trophic ecology, territorial behavior, and phylogenetic interrelationships. Pre: BIOL/MARE 171 or BIOL 175 or their equivalent; MARE 265 or equivalent, or consent of instructor. (Same as BIOL 484)
- MARE 484L Biology of Fishes Laboratory (1) (IO)** Anatomy of jawless, cartilaginous and bony fishes. Review of common local reef fishes. Optional laboratory and field trips for Biology of Fishes. (Same as BIOL 484L)
- MARE 490 Marine Reptile Conservation and Ecology (3) (Summer)** All-encompassing look at the natural history of these ancient marine vertebrates. Topics include investigations of sea turtles, sea snakes, saltwater crocodiles, and marine iguanas throughout the world. Subjects will consist of conservation and management, human impacts, reproduction and feeding ecology, evolution, taxonomy, and anatomy and physiology of these unique marine animals. Pre: MARE 265 or equivalent or consent of instructor.
- MARE 490L Marine Reptile Conservation and Ecology Laboratory (1) (Summer)** Field and lab techniques employed by sea turtle biologists including shore and underwater photo-surveys, forage surveys, and evaluation of nests and hatchlings. Investigations will focus on local species of sea turtles. Pre: Concurrent or previous enrollment in MARE 490.
- MARE 494 Special Topics in Marine Science (1-3) (S) (Summer)** Advanced topics chosen by the instructor. The course content will vary. It may be repeated for credit, provided that a different topic is chosen. Pre: Varies with topic.
- MARE 495 Senior Seminar (3) (S)** Lectures, discussions, and research reports of topics in marine science presented by faculty, students, invited speakers, and visiting scholars. Students will be expected to present a seminar, as well as participate in other course activities. Pre: Senior standing or consent of instructor
- MARE 496 Teaching Assistance & Tutoring in Marine Science (1-3) (Y)** Practice in individual tutoring, and in the preparation of the selected topics in Marine Science lecture or laboratory courses, under direct instructional supervision. This course may be repeated for a maximum of 6 credits and may not be used to replace any specific course or elective requirements of the Marine Science major. Pre: consent of the supervising instructor and the department chair.

MARKETING (MKT)

College of Business and Economics

- MKT 310 Principles of Marketing (3) (S)** Fundamental marketing concepts and contemporary marketing issues are analyzed within present economic, social and legal environments; consumer and functional analysis are emphasized. Pre: Admission to Professional Business Program, ECON 130 and ACC 250.
- MKT 311 Marketing Management (3) (Y)** Planning, evaluation, and control of the marketing function. Procedures for developing the analysis and solution to common marketing management problems involving pricing, distribution, product development and promotion.

Pre: Admission to Professional Business Program, MKT 310.

MKT 313 Promotional Strategy (3) (Y) The role of promotion in an organization's communication processes from a theoretical and managerial perspective. Advertising, personal selling and sales promotion are analyzed from the view of both the organization and its consumer groups. Pre: Admission to Professional Business Program, MKT 310 and junior standing.

MKT 315 Consumer Behavior (3) (Y) An integrated framework for understanding consumer behavior from a marketing perspective. Course focuses on environmental issues, as well as consumer decision processes. Pre: Admission to Professional Business Program, MKT 310.

MKT 316 Services Marketing (3) (Y) Marketing function within a service organization, designing the service product, and establishing service price, communication and distribution policies. Distinctions are developed between marketing strategies of service and goods-oriented organizations, and between "for-profit" and "not-for-profit" organizations. Pre: Admission to Professional Business Program, MKT 310 and MGT 300.

MKT 319 Marketing Research (3) (Y) An overview of the marketing research process as part of an organization's decision support systems. Topics include research design, attitude measurement, along with data sources, collection and analysis. A research application component will emphasize the planning, execution, and analysis of a real-world marketing research project. Pre: Admission to Professional Business Program, MKT 310 and QBA 260.

MKT 399 Directed Studies (1-3) Statement of planned reading or research required. Pre: Admission to Professional Business Program, junior standing and consent of instructor.

MKT 494 Special Topics in Marketing (1-3) Advanced topics chosen by the instructor. The course content will vary. It may be repeated for credit, provided that a different topic is studied. Pre: Admission to Professional Business Program, varies with topic.

MKT 499 Directed Studies (1-3) Statement of planned reading or research required. Pre: Admission to Professional Business Program, senior standing and consent of instructor.

MATHEMATICS (MATH)

College of Arts and Sciences

MATH 100 Survey of Mathematics (3) (S) The role of mathematics in our modern technological society. Topics may include logic, number systems, computers, algebra, and probability. Pre: Recommendation in Math Placement Exam.

MATH 103 Fundamentals of Algebra (3) For students who need to improve algebraic skills prior to taking Pre-calculus or Applied Calculus, or for courses in introductory chemistry, physics, or statistics. Topics include exponents and radicals, factoring, systems of equations, linear equations, quadratic equations, general properties of functions, graphing, polynomial functions, exponential and logarithmic functions. Pre: Math Placement Test.

MATH 104 Precalculus Mathematics (4) (S) MATH 104 is an intensive one semester focus on the material covered in the sequence MATH 104F-104G. A student may not receive credit for both MATH 104 and MATH 104F-104G. Pre: A Math Placement Score greater than 29 or B+ or better in MATH 103 or C or better in MATH 104F.

MATH 104F Pre-calculus I: Functions (3) (S) Functions and relations; polynomial and rational functions; exponential and logarithmic functions; matrices; sequences and series. Pre: A Math Placement Score greater than 19 or C or better in MATH 103.

MATH 104G Pre-calculus II: Trigonometry and Analytic Geometry (3) (Y) Trigonometric functions; analytic trigonometry; analytic geometry. Pre: Math Placement Score greater than 39 or C or better in MATH 104F.

MATH 107 Mathematics for Education I (4) (Y) Concepts, properties and applications of number systems. Intended for prospective elementary school teachers. Class time spent on both lectures and projects. Pre: Recommendation in Math Placement Exam.

MATH 108 Mathematics for Education II (4) (Y) Concepts, properties and applications of topics from probability, statistics, and geometry. Intended for prospective elementary school teachers. Class time spent on both lectures and projects. Pre: MATH 107 or consent of the instructor.

MATH 111 Mathematical Applications of Personal Computers (3) (S) Use of symbols, equations, images in scientific documents. Computations using spreadsheets with sums, averages, and mathematical functions. Data analysis: curve fitting, interpolation, statistics. Data presentation: visualization, charts, and graphs. Symbolic computation. Database processing: forms, queries, reports, VBA. Additional topics chosen from: real-time data acquisition, more advanced statistical methods, system simulation. Intended for science majors. (Same as CS 102) Pre: Recommendation in Math Placement Exam.

MATH 115 Applied Calculus (3) (S) Emphasis on applications and computations rather than theory. Derivatives, curve sketching, optimization, exponential and logarithmic functions, integration, and applications in these areas. Pre: A Math Placement Score greater than 19 or C or higher in MATH 103.

MATH 121 Introduction to Statistics and Probability (3) (Y) Basic topics in statistics and probability. Pre: Recommendation in Math Placement Exam.

MATH 205-206 Calculus I-II (4-4) Yr. (S-S) Basic concepts of differentiation and integration with applications. Integrals of trigonometric, exponential and logarithmic functions; differential equations; techniques of integration and applications, infinite series. Pre: A Math Placement Score greater than 49 or C or higher in MATH 104 or 104G for enrollment in MATH 205. A Math Placement Score greater than 59 or C or better in MATH 205 for enrollment in MATH 206.

MATH 231 Calculus III (3) (Y) Discussion of topics in MATH 205 and MATH 206 in several variables; partial differentiation, max-min problems, multiple integration. Pre: "C" in MATH 206.

MATH 232 Calculus IV (3) (Y) Multiple integrals, line integrals, Green's Theorem, surface integrals, ordinary differential equations. Pre: "C" in MATH 231.

MATH 299 Directed Studies (1-3) (IO) Permission of instructor and statement of planned reading or research required. Pre: sophomore standing.

MATH 300 Ordinary Differential Equations (3) (Y) Theory and methods of solutions of ordinary differential equations and systems of linear differential equations with constant coefficients. Power series solutions, Laplace transforms, and applications. Pre: "C" in MATH 206.

MATH 301 Partial Differential Equations (3) (AY) Construction and behavior of solutions of partial differential equations in physical and engineering applications, classical equations of mathematical physics, initial and boundary value problems, and eigenvalue problems. Pre: MATH 300.

MATH 303-304 Complex Variables with Applications (3-3) Yr. (AY) Introduction to the theory of functions of a complex variable. Analytic functions, Riemann surfaces, complex integration, Taylor and Laurent series, residue theory, conformal mapping. Applications to scientific problems of interest. Pre: MATH 231 for MATH 303; MATH 303 for MATH 304.

MATH 310 Discrete Mathematics (3) (Y) Topics from discrete mathematics, including logic, proof techniques, recurrence relations, set theory, combinatorics, relations, functions, graphs, Boolean algebraic structures and applications to coding theory. Not open to students with credit in CS 215. Pre: MATH 206.

MATH 311 Introduction to Linear Algebra (3) (Y) Algebra of matrices, linear equations, vector spaces, linear transformations, eigenvalue eigenvector problems, diagonalization and basic applications. Pre: C in MATH 310 or CS 215.

MATH 317 Introduction to the Theory of Equations (3) (AY) Number systems as related to solutions of polynomial equations, division algorithm, factorization, fundamental theorem of algebra, location of roots, relations to other areas of mathematics. Pre: "C" in MATH 311, or consent of instructor.

MATH 380 Chaos (3) (AY) An introduction to non-linear dynamical systems for science majors. Topics include dynamics in one and several dimensions, stability, excitable media, fractals, and time series analysis. Applications in physics, chemistry, ecology and other fields are illustrated. Pre: MATH 206 and either PHYS 171 or MATH 232. (Same as PHYS 380)

MATH 394 Topics in Mathematics (1-3) (IO) Intermediate topics chosen by the instructor. Topics will be selected from both the theoretical and applied areas of mathematics. The course content will vary. It may be repeated for credit, provided that a different topic is studied.

MATH 399 Directed Studies (1-3) (IO) Statement of planned reading or research required. Pre: consent of instructor.

MATH 407 Introduction to Numerical Analysis I (3) (Y) Solutions of equations in one variable, direct and iterative methods for systems of linear equations, the algebraic eigenvalue problem, interpolation and polynomial approximation, error analysis and convergence for specific methods. Offered spring semester. Pre: C in MATH 206 and MATH 311 and programming experience. (Same as CS 407)

MATH 421 Elementary Probability Theory (3) (Y) Sets, sample spaces, combinatorial probability, random variables, mathematical expectation, classical distributions, applications. Pre: "C" in MATH 311 or consent of instructor.

MATH 422 Elementary Mathematical Statistics (3) (Y) Statistical inference, estimation, hypothesis testing, regression, correlation, introduction to analysis of variance. Pre: "C" in MATH 421 or consent of instructor.

MATH 431-432 Real Analysis (4-4) Yr. (AY) A study of the basic concepts and theorems underlying classical analysis, including the topology of \mathbb{R}^n , uniform convergence, and differential and integral calculus. Pre: "C" in MATH 232.

MATH 441-442 Geometry I - II (3-3) (AY) Axiomatics, advanced concepts in Euclidian geometry, analytic geometry in the plane and space, differential geometry, basic concepts in modern geometrics: spherical, hyperbolic, Riemannian. Pre: at least a C grade in MATH 231 and MATH 311.

MATH 454-455 Modern Algebra (3-3) Yr. (AY) Basic concepts of algebraic structures, groups, rings, fields, polynomials. Pre: "C" in MATH 311.

MATH 494 Special Topics in Mathematics (1-3) (IO) Advanced topics chosen by the instructor. The course content will vary. It may be repeated for credit, provided that a different topic is studied. Possible topics would be selected from real and complex analysis, elementary topology, matrix groups, numerical analysis, statistics, and probability. Pre: senior standing and consent of the instructor.

MATH 495A-495B Seminar (1-1) Yr. (Y) Seminar presentations of topics in the physical sciences by faculty, enrolled students and invited speakers. The first semester (495A) is taken CR/NC; in the second semester (495B), students are required to present a seminar for a letter grade. Pre: senior standing or consent of instructor. (Same as ASTR 495A-495B, GEOL 495A-495B, CHEM 495A-495B and PHYS 495A-495B)

MATH 496 Teaching Assistance and Tutoring in Mathematics (1-3) (S) Practice in individual tutoring and in the preparation of the selected topics in mathematics lecture or laboratory courses, under direct instructional supervision. This course may be used for a maximum of six (6) credits and may not be used for substitution for any specific course or elective requirements of the Mathematics major. Pre: Consent of the supervisor and the department chair.

MATH 499 Directed Studies (1-3) (IO) Statement of planned reading or research required. Pre: senior standing and consent of instructor.

MUSIC (MUS)

College of Arts and Sciences, Performing Arts Department

MUS 102 University Chorus (3) (S) Large ensemble singing of traditional choral literature. Fundamentals of voice production and musicianship. Study of composers and compositional styles from selected periods of music history. Public performance required. No audition required. May be repeated for credit.

MUS 123 Elementary Voice Class I (1) (Y) Fundamentals of voice production applied to vocal literature at elementary level.

MUS 124 Elementary Voice Class II (1) (Y) A continuation of MUS 123. Refinement of vocal skills; study and performance of vocal literature in English and other languages. Pre: MUS 123.

MUS 125 Class Piano I (1) (Y) Basic principles of piano performance. Relevant problems in piano literature at elementary level. This course is designed for Performing Arts majors (or intended majors) only. Pre: MUS 180 or placement conference.

MUS 126 Class Piano II (1) (Y) A continuation of MUS 125. Application of harmonic concepts and basic keyboard techniques. Expanding repertoire of pieces at the elementary level. Pre: MUS 125.

MUS 135-136 First-Level Applied Music (Arr) (S) For music majors or performers of considerable experience. Individual instruction given in voice, piano, wind instruments, and percussion. Instruction is given in individual lessons for music majors and minors. One (1) credit consists of one half-hour lesson per week for 13 weeks of the semester. Two (2) credits may be earned by taking either two half-hour lessons per week, or one (1) one-hour lesson per week. Applied Music fees are in addition to regular tuition. For Applied Music courses and fee structure, see Performing Arts department chair and consult instructor at the time of registration. Students are required to participate in student recitals and juries.

MUS 160 Introduction to Music Literature (3) (Y) Appreciation of western art music through discussion, listening and reading. Study of elements, textures, forms and style characteristics. No previous music knowledge required.

MUS 163 American Music and Popular Culture (3) (Y) A survey of American musical styles of the 20th century, including rock, blues, jazz, country, Motown, R&B, and other folk idioms. Emphasis will be on stylistic evolution, interactions, and social context. No previous musical knowledge is required.

MUS 165 Introduction to Jazz (3) (IO) A survey of classic and modern jazz in a historical framework. Study of elements, trends, genres, forms and style characteristics. Appreciation of jazz through discussion, listening and reading. No previous musical knowledge is required.

MUS 175 Introduction to the Music of Polynesia (3) (AY) A general survey of the traditional and acculturated music of eight major Polynesian island groups: Tonga, Samoa, New Zealand, Cook Islands, Society Islands, Marquesas Islands, Easter Island, and Hawai'i. Music is viewed as both an organization of sound and as a product of culture and people. (Same as HWST 175)

MUS 176 The History and Development of Hawaiian Music (3) (AY) A general survey of the interrelationships of traditional and acculturated Hawaiian music. Vocal music genres to be discussed include: chant; Christian hymn singing; secular choral singing; male and female falsetto singing; *Chalangalang*; *Hapa Haole*; and contemporary. Instrumental music genres include: pre-European instrumental styles; slack key guitar; 'ukulele; and steel guitar. (Same as HWST 176)

MUS 180 Elementary Music Theory (3) (S) Designed for non-music majors. Aural skills and musical notation: pitch, rhythm, tonality, and chord structure. First experiences at the piano also included.

MUS 185 Music Theory I (3) (Y) Designed for those with sufficient musical background. Basic concepts and materials of music. General awareness of musical styles, with concentration on 18th-century norms. Principles of tonality, harmony, 4-part writing. Connecting sound and notation through writing. Must be taken concurrently with MUS 185L. Pre: placement conference.

MUS 185L Music Theory I Laboratory (1) (Y) Connecting sound and notation through analysis, aural dictation, and sight singing. Taken concurrently with MUS 185.

MUS 186 Music Theory II (3) (Y) Emphasis on harmonic aspects of tonal music, including all diatonic triads, dominant 7th and secondary dominants. Small forms, increased application through analysis and writing. Must be taken concurrently with MUS 186L. Pre: Music 185 and MUS 185L.

MUS 186L Music Theory II Laboratory (1) (Y) Increased application of aural skills through analysis, dictation, and sight-singing. Reinforces concepts presented in MUS 186. Taken concurrently with MUS 186. Pre:

- MUS 185 and 185L.
- MUS 199 Directed Studies (1-3) (S)** Permission of instructor and statement of planned reading or research required.
- MUS 235-236 Second-Level Applied Music (Arr) (S)** For music majors or performers of considerable experience. Continuation of MUS 135-136. Instruction is given in individual lessons for music majors and minors. One (1) credit consists of one half-hour lesson per week for 13 weeks of the semester. Two (2) credits may be earned by taking either two half-hour lessons per week, or one (1) one-hour lesson per week. Applied Music fees are in addition to regular tuition. For Applied Music courses and fee structure, see Performing Arts department chair and consult instructor at the time of registration. Students are required to participate in student recitals and juries. Pre: MUS 136.
- MUS 285 Music Theory III (3) (Y)** Wider awareness of musical styles; concentration on chromaticism of the 19th century. Diatonic 7th, N6, Aug6, altered dominants, chromatic mediants, 9th, 11th and 13th chords. Large formal designs and advanced melodic/harmonic developments. Examined through analysis and writing. Must be taken concurrently with MUS 285L. Pre: MUS 186 and 186L.
- MUS 285L Music Theory III Laboratory (1) (Y)** Expanded concepts in aural dictation and sight-singing. Reinforces concepts presented in MUS 285. Taken concurrently with MUS 285. Pre: MUS 186 and 186L.
- MUS 286L Music Theory IV Laboratory (1) (Y)** Expanded concepts in aural dictation and sight-singing. Pre: MUS 285 and 285L.
- MUS 299 Directed Studies (1-3) (Y)** Permission of instructor and statement of planned reading or research required. Pre: Sophomore standing.
- MUS 335-336 Third-Level Applied Music (Arr) (S)** For music majors or performers of considerable experience. Continuation of MUS 235-236. Instruction is given in individual lessons for music majors and minors. One (1) credit consists of one half-hour lesson per week for 13 weeks of the semester. Two (2) credits may be earned by taking either two half-hour lessons per week, or one (1) one-hour lesson per week. Applied Music fees are in addition to regular tuition. For Applied Music courses and fee structure, see Performing Arts department chair and consult instructor at the time of registration. Students are required to participate in student recitals and juries. Pre: MUS 236.
- MUS 349 Orchestration (3) (AY)** Survey of instruments of the orchestra and band. Study of selected scores. Basic principles of scoring and transcribing for the orchestra or band. Two semester projects. Pre: MUS 186 or consent of instructor.
- MUS 365-366 History of Western Music (3-3) Yr. (AY)** Development of Western music from its origins to the 20th century. Styles, schools, and composers. Pre: MUS 160 and 186, or consent of instructor.
- MUS 385 20th Century Composition Techniques (3) (AY)** Study of the major compositional techniques and esthetics of 20th century music, including parallelism, atonality, serialism, pandiatonicism, neo-classicism, indeterminacy, extended techniques, electronic music, neo-romanticism, and eclecticism. Examine important schools of composition, analysis of major works, and composition exercises. Pre: MUS 285 or consent of instructor.
- MUS 390 Choral Conducting (3) (IO)** Basic conducting technique and its application to the directing of choral organizations. Includes score reading, lyric diction, rehearsal techniques, and interpretative problems. Concurrent enrollment in a choral ensemble is required. Pre: MUS 186 or consent of instructor.
- MUS 399 Directed Studies (1-3) (S)** Statement of planned reading or research required. Pre: junior standing and consent of instructor.
- MUS 402 Instrumental Ensemble (3) (S)** Instruction and rehearsal in various types/genres of instrumental music. Public performance may be required, depending on instrumentation and personnel. Emphasis on music literacy and individual performance skills. May be repeated for credit. Pre: audition, or consent of instructor.
- MUS 404 University Showcase Singers (3) (S)** Performance of choral literature from Renaissance to the present, including ethnic music of Hawai'i. Public performance required. May be repeated for credit. Pre: audition and consent of instructor.
- MUS 406 (Alpha) Chamber Ensemble(s) (2) (S)** Rehearsals and performance of chamber music for small instrumental/vocal groups. B: Collegium Musicum (Early Music Consort); C: Vocal Music; D: Keyboard Accompanying; E: Saxophone Quartet; F: Chamber Music; G: Brass Ensemble; H: String Ensemble; I: Woodwind Ensemble; J: Percussion Ensemble; L: New Music Ensemble; M: Musical Theatre. Public performance required. May be repeated for credit. Pre: audition and consultation.
- MUS 419 Music for Elementary Teachers (3) (AY)** Survey of practical methods and materials used in teaching basic musical concepts in the elementary classroom; emphasis on music fundamentals, creative activities, and comprehensive musicianship for elementary students; development of skills in singing and using classroom instruments. Pre: MUS 180 or consent of instructor.
- MUS 435-436 Fourth-Level Applied Music (Arr) (S)** For music majors or performers of considerable experience. Continuation of MUS 335-336. Instruction is given in individual lessons for music majors and minors. One (1) credit consists of one half-hour lesson per week for 13 weeks of the semester. Two (2) credits may be earned by taking either two half-hour lessons per week, or one (1) one-hour lesson per week. Applied Music fees are in addition to regular tuition. For Applied Music courses and fee structure, see Performing Arts department chair and consult instructor at the time of registration. Students are required to participate in student recitals and juries. Pre: MUS 336.
- MUS 462 Choral Music (3) (AY)** Historical and stylistic study of choral literature from the Renaissance to the present. Pre: MUS 365 and 366, or concurrent enrollment in 366, or consent of instructor.
- MUS 485 Form and Analysis (3) (AY)** Structural analysis of music literature from various style periods, including standard form types and analytical techniques applicable to post-19th century music. Pre: MUS 285.
- MUS 487 Counterpoint (3) (IO)** Contrapuntal procedures and techniques of the 16th (modal counterpoint) and 18th (tonal counterpoint) centuries. Pre: MUS 285.
- MUS 494 (Alpha) Special Topics in Musicology (3) (Y)** Specialized focus on selected topics from one of the historical style periods, including composer biographies, genre studies, analytical studies, topics in the historical and sociological context of music, musicological research issues and methodologies, and/or bibliographic studies. A: Medieval; B: Renaissance; C: Baroque; D: Classical; E: Romantic; F: 20th Century. Pre: MUS 285, 365, and 366, or consent of instructor.
- MUS 499 Directed Studies (1-3) (S)** Statement of planned reading or research required. Pre: senior standing and consent of instructor.

NATURAL RESOURCES (NRES)

College of Agriculture, Forestry and Natural Resource Management

- NRES 230 Philippines Environment and Natural Resources (3) (Y)** Examination of the Philippines environment and natural resources from a long-term perspective. Analysis of the effects of resource management practices on environmental quality, agroecosystems, the economy, and food security. Consideration of conflicting values and resolution. Offered spring semester only.
- NRES 320 Environmental Issues in Asia-Pacific (3)** This course examines the impact of rapid agricultural development, deforestation, industrialization, and urbanization on air, soil, and water in the Asian-Pacific environment plus the causes, consequences, and corrective measures for pollution in this region. Combinations of expert approaches and geo-information systems, including introductory modeling, are used to predict contaminant fate, behavior, and critical load. CHEM 114/124 or equivalent is recommended.
- NRES 425 Marine Biogeochemistry (3) (Y)** Marine biogeochemistry examines the chemical processes occurring in marine and estuarine waters, their impact on near shore and oceanic environments, and their connection to climatic stability. Marine biogeochemistry is inherently interdisciplinary, involving aspects of biology, earth science, and physics as well as chemistry. Pre: CHEM 124 or consent of instructor.

NATURAL SCIENCE (NSCI)**College of Arts and Sciences**

NSCI 394 Special Topics in the Natural Sciences (1-3) (IO) Selected topics in the natural sciences chosen by the instructor. The course content will vary. May be repeated provided a different topic is studied. Pre: consent of instructor.

NSCI 494 Special Topics in the Natural Sciences (1-3) (IO) Selected topics in the natural sciences chosen by the instructor. The course content will vary. May be repeated provided a different topic is studied each time. Pre: Junior standing and/or consent of instructor.

NURSING (NURS)**College of Arts and Sciences**

NURS 203 General Pharmacology (3)(Y) Pharmaceuticals discussed with emphasis on methods and sites of administration, mechanisms of action, toxicity, rate and uses of major therapeutic agents. Intended for undergraduates in the health sciences and related fields. Prerequisites: MATH 100, BIOL 243, 243L, 244, 244L or consent of instructor.

NURS 347 Health Assessment (3) (Y) Introduction to comprehensive health assessment of clients across the life span using critical thinking skills. Emphasis on the pathophysiologic influences on subjective and objective findings of selected systems. Detailed health assessment techniques will be introduced as well as methods of comprehensive history-taking. Note: Restricted to Nursing students only.

NURS 347L Health Assessment Practicum (1) (3 lab hrs.) (Y) Application of the nursing process in the comprehensive health assessment of clients across the life span. Emphasize the pathophysiologic and/or pathopsychologic influences on subjective and objective findings of selected systems. Detailed health assessment techniques as well as comprehensive history-taking. Note: Restricted to Nursing students only.

NURS 348 Human Pathophysiology (3) (Summer) This course explores concepts of the biological basis for disease in adults and children. Alterations in normal body functions leading to disease and discomfort of the individual will be presented within an organized framework. Pre: NONE

NURS 350 Transcultural Care and Health Promotion (3) (Y) The course introduces basic principles of teaching-learning, adult learning, group process and basic transcultural care and health promotion concepts. Note: Restricted to Nursing students only.

NURS 351 Professional Nursing Issues and Trends (3) (Y) Introduction of contemporary health reform issues and trends affecting the nursing profession. Overview of the history of nursing, significant national nursing studies, code of ethics, relationship of nursing theory to nursing practice and nursing research. Includes introduction to client care management. Note: Restricted to Nursing students only.

NURS 352L Nursing Skills Laboratory (1) (Y) Practice of basic clinical skills in a campus laboratory setting to prepare student for clinical practice in community settings. Includes faculty demonstrations, student return-demonstrations, and performance testing. Note: Restricted to Nursing students only.

NURS 353 Nursing Concepts and Skills (3) (Y) Introduction to the art and science of the professional role of transcultural nursing care. Fundamental nursing concepts, process, and practice will provide the novice nursing student with a firm foundation for advanced nursing study. Note: Restricted to Nursing students only.

NURS 353L Nursing Concepts and Skills Practicum (3) (9 lab hrs.) (Y) Introduction to the application of the nursing process in the delivery of care to medical/surgical populations. Comprehensive, faculty-guided experiences in developing a beginning knowledge base for entry into the nursing profession. Note: Restricted to Nursing students only.

NURS 355 Adult Health Care I (3) (Y) Care of adult clients with acute medical/surgical problems. Integration of pathophysiology in the understanding of human responses to health deviations. Use of the nursing process to develop individualized, culturally congruent care plans. Note: Restricted to Nursing students only.

NURS 355L Adult Health Care I Practicum (3) (9 lab hrs.) (Y) Application of the nursing process in providing individualized, culturally congruent care to adult clients with acute medical/surgical problems. Note: Restricted to Nursing students only.

NURS 356 Parent-Newborn Health Care (3) (Y) Emphasizes the nursing process in applying culturally congruent nursing care to child-bearing families. Note: Restricted to Nursing students only.

NURS 356L Parent-Newborn Health Care Practicum (3) (9 lab hrs.) (Y) Application of the nursing process in providing culturally congruent nursing care interventions to child bearing families. Supervised clinical experiences in the labor and delivery room, newborn nursery, post-partum units, as well as community meetings. Note: Restricted to Nursing students only.

NURS 357 Mental Health Care (3) (Y) Application of mental health concepts, transcultural caring and professional nursing skills in delivering mental health care. Includes study and application of treatment modalities appropriate to selected psychopathological conditions. Note: Restricted to Nursing students only.

NURS 357L Mental Health Care Practicum (3) (9 lab hrs.) (Y) Application of nursing process in the delivery of mental health care to selected populations. Faculty guided clinic experience in acute and community settings. Note: Restricted to Nursing students only.

NURS 358 Nursing Research (3) (Y) Introduction to the research process and the application of the scientific method in nursing. Pre: Statistics course. Note: Restricted to Nursing students only.

NURS 371 Computers and Health Care (3) (Y) Overview of computer systems and their roles in communications and data management both within and outside of the clinical context. Impact of computerized information processing on nursing practice. Note: Restricted to Pre-nursing and Nursing students only.

NURS 372 Spirituality in Health Care (3) (Y) An examination of the role of spirituality in patient care for clients of multicultural backgrounds across the life span. Exploration of spirituality as an integral part of self. Spring semester only.

NURS 373 Gerontological Health Care (3) (Y) Care of the aging adult with an emphasis on successful aging and health promotion. Integration of theory and evidence-based practice in providing culturally congruent care. Fall semester only.

NURS 374 Skills for Nursing Leadership and Management (3) (Summer) Development of effective leadership skills, communication skills, interpersonal skills, presentation and technical writing skills necessary for nursing leadership and management. Emphasis on team management and conflict resolution skills are included.

NURS 375 Applied Human Nutrition (3) (Y) Applied nutrition in human health and disease, and the nurse's role in supporting nutritional care. Pre: one chemistry and one anatomy/physiology course, or consent of instructor. Note: Restricted to Pre-nursing and Nursing students only.

NURS 394 Special Topics in Nursing (1-3) Intermediate topics chosen by the instructor. Topics will be selected from both the theoretical and clinical areas of professional nursing. The course content will vary. It may be repeated for credit, provided that a different topic is studied.

NURS 399 Directed Studies (1-3) Statement of planned reading or research required.

NURS 410 Community Health Care (2) (Y) Content will integrate nursing and community health theories. Emphasis on culturally sensitive care to families and other groups in a variety of community health delivery settings. Identification of community resources and processes for implementing change to promote community health. Note: Restricted to Nursing students only.

NURS 410L Community Health Care Practicum (4) (12 lab hrs.) (Y) Application of the nursing process in the delivery of nursing care to individuals, families, groups, and communities. Integration of community resources in collaborative relationships with community agencies to service populations with specific health care needs. Note: Restricted to Nursing students only.

NURS 455 Adult Health Care II (3) (Y) Prevention intervention and therapeutic modalities in caring for adult clients with acute medical and/or surgical problems. Emphasis on increasing medical-surgical nursing expertise with incorporation of client management skills and more advanced problem solving. Note: Restricted to Nursing students only.

NURS 455L Adult Health Care II Practicum (5) (15 lab hrs.) (Y) Continued care of adult clients with acute medical and/or surgical problems. Emphasis on increasing medical-surgical nursing expertise with incorporation of patient management skills and more advanced problem solving. Note: Restricted to Nursing students only.

NURS 456 Parent-Child Health Care (3) (Y) Emphasizes the nursing process in the provision of safe and culturally appropriate care to children in the context of the family. Preventive health care, anticipatory guidance and health promotion in a developmental context are explored. Note: Restricted to Nursing students only.

NURS 456L Parent-Child Health Care Practicum (3) (9 lab hrs.) (Y) Application of the nursing process in delivery of nursing care to infants, children, adolescents, and their families. Focus on growth and development, health assessment and health promotion/disease prevention. Note: Restricted to Nursing students only.

NURS 457 Collaborative Health Care, Leadership and Management (3) (Y) Management and leadership concepts in delivering comprehensive nursing care to clients with complex health care needs. Emphasis on critical thinking and evaluation of clinical judgment in nursing practice. Organizational resources and delivery patterns are investigated for their effectiveness in addressing client needs in a variety of community settings. Note: Restricted to Nursing students only.

NURS 457L Collaborative Health Care, Leadership and Management Practicum (2) (6 lab hrs.) (Y) Application of management and leadership concepts in delivering comprehensive nursing care to clients with complex health care needs. Emphasis on critical thinking and evaluation of clinical judgments in nursing practice. Incorporation of organizational resources and delivery patterns into nursing care that is effective and addresses client needs in a variety of community settings. Note: Restricted to Nursing students only.

NURS 459 Nursing Review (1) (Y) Review of human body systems, nursing management, concepts, and skills in client health care. Note: Restricted to Nursing students only.

NURS 459L Nursing Review Practicum (1) (3 lab hrs.) (Y) Application of nursing skills in concentrated clinical experience in the acute care setting. Note: Restricted to Nursing students only.

NURS 468 Nursing Management and Leadership: Politics of Care (3) (Y) Overview of current health issues on the local, state, national and international levels. Emphasis on the concept of empowerment and active involvement in facilitating changes in health policies. Includes nursing management. Note: Restricted to Nursing students only.

NURS 469 BSN Nursing Preview (3) (Y) Preview of academic and clinical opportunities for baccalaureate level nurses with an emphasis on leadership roles and advanced practice. Exploration of strategies for success as a life-long learner. An experiential component is included in this course which will supplement didactic content. This course is restricted to licensed registered nurses who are in the RN to BSN Option of the BSN Program, or by instructor permission. Offered spring semester only.

NURS 494 Special Topics in Nursing (1-3) (IO) Advanced topics chosen by the instructor. Topics will be selected from both the theoretical and clinical areas of professional nursing. The course content will vary. It may be repeated for credit, provided that a different topic is studied.

NURS 499 Directed Studies (1-3) (S) Statement of planned reading or research required.

PHILOSOPHY (PHIL)

College of Arts and Sciences

PHIL 100 Introduction to Western Philosophy (3) (S) Major philosophers, methods, and issues in Western philosophy. Discussion of such problems as our knowledge of reality, the freedom of the will, the rela-

tions between the mind and body, morality, ethics, the meaning of life, and the existence of God.

PHIL 101 Introduction to Asian Philosophy (3) (S) Philosophical teachings of Hinduism, Buddhism, Jainism, Confucianism, Taoism, Neo-Confucianism, and Shintoism.

PHIL 209 Reasoning (3) (Y) Informal logic: Study of practical reasoning, argument, and the use and misuse of language. Emphasis on development of critical thinking skills.

PHIL 211 History of Ancient Philosophy (3) (Y) Philosophy of the Pre-Socratics, Plato, Aristotle and Roman Thinkers.

PHIL 213 History of Modern Philosophy (3) (Y) From the Renaissance to the 19th century. PHIL 200 recommended.

PHIL 220 Social Ethics (3) (Y) Contemporary ethical issues, such as abortion, euthanasia, the death penalty, sexual equality, sexual integrity, discrimination and reverse discrimination, violence, pornography, ethnic injustice, and environmental and population control.

PHIL 230 Belief, Knowledge and Truth (3) (Y) The sources and limits of human knowledge. Classical and contemporary epistemological theories, and their application to the everyday search for knowledge.

PHIL 299 Directed Studies (1-3) (IO) Statement of planned reading or research required. Pre: sophomore standing and consent of instructor.

PHIL 300 History of Indian Philosophy (3) (IO) The historic Indian schools of thought, Brahmanism, Jain, Carvaka, Buddhist, Samkyha, Yoga, Nayaya, Vaisheshika, Mimamsa, and Vedanta. The main philosophers and thinkers of India including Gandhi, Radhakrishnan, and Tagore. Pre: previous work in philosophy or religious studies is recommended.

PHIL 301 History of Chinese Philosophy (3) (Y) History of the Confucian, Taoist, and Buddhist philosophies and their interaction in China. The pivotal thinkers including Mao. Pre: previous work in philosophy or religious studies is recommended.

PHIL 302 History of Buddhist Philosophy (3) (AY) History of Buddhist philosophy and its cultural influence and intellectual development in Asia and Hawai'i. Pre: previous work in philosophy or religious studies is recommended.

PHIL 310 Metaphysics (3) (Y) Puzzling problems in Western thought, such as the nature of personal identity, the freedom of the will, time, and the relation between mind and body. Pre: previous work in philosophy.

PHIL 315 Ethical Theory (3) (Y) Classical and contemporary theories of right and good. Pre: previous work in philosophy.

PHIL 320 Social and Political Philosophy (3) (AY) Good and right applied to economic, political, and religious establishments; obligation, freedom of dissent, capital punishment, violence, rights, revolution, and war. Pre: previous work in philosophy; PHIL 220 recommended.

PHIL 323 Professional Ethics (3) (AY) Professional conduct is being questioned as never before—lawyers, physicians, engineers, accountants, etc., are criticized for disregarding the rights of clients and the public interest. The course addresses the ethical problems of “the professions” in general and will focus on professions in business, law, and health care. Pre: previous course work in philosophy.

PHIL 325 Philosophy of Law (3) (AY) Problems and controversies in the nature of law and its bearing on human conduct. Topics: legal and moral obligation, obedience and respect, enforcement of morality, punishment and responsibility, justification of practices such as plea bargaining, bail, prosecutorial discretion, etc. Pre: previous work in philosophy.

PHIL 330 Aesthetics (3) (IO) The aesthetic object, form in art, representation, meaning in art, and claims of knowledge in art. Pre: previous work in philosophy and in art or music.

PHIL 340 Philosophy of Religion (3) (AY) Philosophical problems in religious beliefs and religious knowledge. The existence of God, immorality, the problem of evil. Pre: previous work in philosophy or Religious Studies.

- PHIL 345 Symbolic Logic (3) (Y)** Techniques of symbolic logic, including propositional logic, predicate logic and the logic of relations.
- PHIL 360 Existentialism (3) (IO)** The themes which recur in the works of existential philosophers from the 19th century to the present. Pre: junior standing or consent of instructor.
- PHIL 381 Philosophy of Wittgenstein (3) (AY)** Topics in the philosophy of Ludwig Wittgenstein, such as: meaning, understanding, private language, "family resemblance," language-games, knowledge and certainty, other minds, forms of life and the purpose of philosophy. Pre: previous work in philosophy.
- PHIL 390 History and Philosophy of Science (3) (AY)** Natural science as a knowledge-seeking activity. Major episodes in the history of the physical and biological sciences; philosophical understanding of scientific observation, theory, and revolutionary change. Pre: previous work in philosophy or consent of instructor.
- PHIL 392 Biology and Philosophy (3) (AY)** Philosophical examination of the implications of modern biology for how we understand ourselves and our relations to the natural world. Evolutionary, genetic, developmental, and ecological topics will be discussed. Pre: previous work in philosophy and biology, or consent of instructor. (Same as BIOL 392)
- PHIL 393 Normality, Abnormality, and Society (3) (AY)** Philosophical study of how human diversity interacts with social norms. Topics include health and illness, disability, gender, and sexual orientation. Perspectives from biology and the social sciences are included in a study of how beliefs about normality vary between cultures, change through time, and affect human relations. Pre: Previous work in philosophy or consent of instructor. Same as WS 393.
- PHIL 394 Special Topics in Philosophy (3) (AY)** Advanced topics chosen by the instructor. The course content will vary. It may be repeated for credit, provided that a different topic is studied. Pre: Previous work in philosophy.
- PHIL 399 Directed Studies (1-3) (IO)** Statement of planned reading or research required. Pre: junior standing and consent of instructor.
- PHIL 430 Philosophy of Zen (3) (AY)** Chief philosophical teachings of Zen, its methods and cultural influences. Comparative study of Zen and Western thought. Pre: previous work in philosophy or religious studies, or consent of instructor. PHIL 302 is recommended. (Same as JPST 430)
- PHIL 435 Philosophy of Tao (3) (IO)** Philosophical ideas of Lao Tzu, Chuang Tzu, and the Neo-Taoists, and their influences upon the lives of the Chinese and Japanese peoples. Comparative study of Taoist and Western philosophy. Pre: previous work in philosophy or religious studies, or consent of instructor. PHIL 301 is recommended.
- PHIL 450 Mahayana Buddhist Philosophy (3) (Y)** Important tenets and major schools of Mahayana Buddhist philosophy in India, China, Japan, Tibet, and Hawai'i. Comparative study of Mahayana and Western philosophy. Pre: previous work in philosophy, religious studies, or consent of instructor. PHIL 302 is recommended. (Same as JPST 450)
- PHIL 494 Special Topics in Philosophy (1-3) (IO)** Advanced topics chosen by the instructor. The course content will vary. It may be repeated for credit, provided that a different topic is studied. Pre: senior standing and consent of instructor.
- PHIL 497 Seminar in Philosophy (3) (IO)** For serious students of philosophy. The topics vary and the course may thus be repeated for credit.
- PHIL 499 Directed Studies (1-3) (IO)** Statement of planned reading or research required. Pre: senior standing and consent of instructor.

PHYSICS (PHYS)

College and Arts and Sciences

- PHYS 106 College Physics I (3) (Y)** Basic principles of physics designed for students in non-physical science and education majors. Covers mechanics, waves and heat. Pre: three years of high school math and placement exam. See also, PHYS 170L, which serves as the lab course.
- PHYS 107 College Physics II (3) (Y)** Basic principles of physics designed for students in non-physical science and education majors. Covers electricity and magnetism, optics, and modern physics. Pre: Physics 106. See also, PHYS 171L, which serves as the lab course.
- PHYS 115 Physics for the Liberal Arts (3) (Y)** Designed for non-science majors. Basic physical concepts through student's active participation and practical experience in a manner that is simple and intuitive.
- PHYS 120 Weather and Climate of Hawai'i (3) (Y)** For non-science majors and prospective science teachers. Basic meteorology, sun-earth-ocean-atmosphere interrelationships, weather types, seasonal changes, trade winds, clouds, rainfall, with examples drawn from the local weather and climate. (Same as GEOG 120)
- PHYS 170 General Physics I-Particles and Waves (4) (Y)** Introductory physics designed for students majoring in physical sciences or engineering **excluding physics or astronomy majors**. Covers mechanics of particles; rigid bodies and fluids; wave motion; thermodynamics and kinetic theory. Pre: MATH 205 and placement exam.
- PHYS 170L General Physics Laboratory I (1) (1 3-hr. lab) (Y)** A required laboratory supplement for 170 and 172; covers basic principles of experimentation and physical measurement. Pre: registration in PHYS 106 or 170 or 172.
- PHYS 171 General Physics II-Electricity and Magnetism (4) (Y)** Introductory physics designed for students majoring in physical sciences or engineering **excluding physics or astronomy majors**. Covers electrostatics, conductors and current, dielectrics, magnetic fields and induction, Maxwell's equations and basic optics. Pre: PHYS 170, PHYS 170L, MATH 206 (or concurrent).
- PHYS 171L General Physics Laboratory II (1) (1 3-hr. lab) (Y)** A required laboratory supplement for Physics 171 and 173; covers basic principles of experimentation and physical measurement. Pre: Physics 106 or 170 or 172, 170L, registration in PHYS 107 or 171 or 173.
- PHYS 172 General Physics I-Particles and Waves (4) (Y)** Introductory physics designed for students **with a declared major or minor in physics or astronomy**. Covers mechanics of particles; rigid bodies and fluids; wave motion; thermodynamics and kinetic theory. Pre: MATH 205 and placement exam.
- PHYS 173 General Physics II-Electricity and Magnetism (4) (Y)** Introductory physics designed for students **with a declared major or minor in physics or astronomy**. Covers electrostatics, conductors and current, dielectrics, magnetic fields and induction, Maxwell's equations and basic optics. Pre: PHYS 170, PHYS 170L, MATH 206 (or concurrent).
- PHYS 260 Computational Physics and Astronomy (3) (Y)** Computational techniques in physics and astronomy, with an emphasis on the use of computer engineering and scientific software. Topics covered include approximation techniques, numerical modeling of physical systems, solutions of non-linear and inverse problems, Fourier analysis and filtering, and elementary statistical and numerical concepts. Pre: PHYS 170/171, MATH 205/206 (Same as ASTR 260)
- PHYS 270 General Physics III-Introduction to Modern Physics (3) (Y)** Survey of contemporary physical theory and applications: special relativity; quantum physics: atomic structure and spectra, molecular and solid-state physics; nuclear structure and reactions; elementary particles and fundamental forces. Pre: PHYS 170-171 and credit or registration in MATH 231.
- PHYS 271 General Physics IV-Classical Mechanics (3) (Y)** The classical kinematics and dynamics of constant, time-dependent and position-dependent forces. Particle, rigid body and fluid dynamics; central force motion; normal modes of vibrations; introduction to Lagrangian and Hamiltonian formalism. Pre: PHYS 170-171 (A or B) and MATH 300.
- PHYS 299 Directed Studies (1-3)** Permission of the instructor and a statement of planned reading or research is required. Pre: sophomore standing.
- PHYS 330 Electromagnetism (3) (AY)** Electrostatics; electric and magnetic properties of materials; Maxwell's equations of electromagnetism; electrodynamics; electromagnetic waves and boundary value problems. Pre: PHYS 171, MATH 231, MATH 232, MATH 300.

PHYS 331 Optics (3) (AY) Modern optics and the design of optical instruments: interactions of electromagnetic radiation with matter; paraxial and Seidel optical theory; design of simple optical instruments; aberrations and stops; design of telescope, spectrographs, and interferometers; photon optics; Fourier optics. Pre: PHYS 270, MATH 231.

PHYS 341 Thermodynamics (3) (AY) Thermodynamic properties of matter; equations of state; heat transfer; classical statistical treatment of kinetic theory. Pre: PHYS 171, PHYS 270.

PHYS 360 Mathematical Physics (3) (AY) Special functions of mathematical physics which arise from Sturm-Liouville equations: Bessel, beta, elliptical, gamma and Legendre functions. Generating functions, complex integral representations. Other topics may include integral transforms, Fourier analysis and linear algebra. Pre: MATH 232, or MATH 231 and MATH 300, or consent of instructor.

PHYS 380 Chaos (3) (AY) An introduction to nonlinear dynamical systems for science majors. Topics include dynamics in one and several dimensions, stability, excitable media, fractals, and time series analysis. Applications in physics, chemistry, ecology and other fields are illustrated. Pre: MATH 206 and either PHYS 171 or MATH 232. (Same as MATH 380)

PHYS 399 Directed Studies (1-3) Permission of the instructor and a statement of planned reading or research is required. Pre: junior standing.

PHYS 430-431 Modern Physics (3-3) Yr. (AY) Introductory quantum mechanics and its applications to nuclear, atomic, and particle physics. Quantum mechanical treatment of molecular structure and spectra, and the thermal properties of matter. Pre: PHYS 170-171, 270, 341.

PHYS 432 Senior Laboratory/Thesis Project (3) (Y) Individual research projects conducted in the college laboratory, library, or observatory; or at an external research facility; under the direct guidance of a member of the physics and astronomy faculty or an affiliated faculty member. Students must propose and complete a research project, and present a final report to the department. May be repeated once for a maximum of 6 credits. Permission of the department is required for registration. (Same as ASTR 432)

PHYS 494 Special Topics in Advanced Physics (3) (IO) Detailed study of selected topics in advanced physics, topic to be chosen by instructor. Course content will vary; the course may be repeated for credit, provided a different topic is studied. Possible topics include: solid-state physics; Lagrangian and Hamiltonian dynamics, advanced thermodynamics or quantum mechanics. Pre: consent of instructor.

PHYS 495A-495B Seminar (1-1) Yr. (S) Seminar presentations of topics in the physical sciences by faculty, enrolled students and invited speakers. The first semester (495A) is taken CR/NC; in the second semester (495B), students are required to present a seminar for a letter grade. Pre: senior standing or consent of instructor. (Same as ASTR 495A-495B, CHEM 495A-495B, GEOL 495A-495B and MATH 495A-495B.)

PHYS 499 Directed Studies (1-3) Permission of instructor and statement of planned reading or research required. Pre: senior standing.

PLANT PATHOLOGY (PPTH)

College of Agriculture, Forestry and Natural Resource Management

PPTH 301 Tropical Plant Pathology (2 lec., 1 lab) (3) (S) Principles of plant pathology, major diseases in the tropics caused by fungi, bacteria, nematodes, and viruses; their nature, diagnosis and control. Pre: BIOL 175 or consent of instructor.

PPTH 405 Plant Disease Diagnosis (2 lec., 1 lab) (3) (Y) Practical skills in field and laboratory to determine the cause of a plant disease. Recognition of characteristic symptoms of diseased plants and signs of pathogens; use of confirming tests. Pre: PPTH 301.

PPTH 412 Plant Disease Control (2 lec., 1 lab) (3) (Y) Methods and principles of plant disease control, including chemical and nonchemical means, based on epidemiology and the disease cycle. Formulation and application of control recommendations. Pre: PPTH 301.

PLANT PHYSIOLOGY (PPHY)

College of Agriculture, Forestry and Natural Resource Management

PPHY 310 Plant Growth and Development (2 lec., 1 lab) (3) (Y) The chemistry and physiology of growth regulators and their involvement in plant growth and development. Experiments and demonstrations illustrating both basic and applied aspects of chemical growth regulation. Pre: HORT 262 or BIOL 175 and one year of college chemistry.

POLITICAL SCIENCE (POLS)

College of Arts and Sciences

POLS 101 Introduction to American Politics (3) (S) Organization and functioning of the American political system at the national level.

POLS 220 Introduction to Legal Systems (3) (Y) The legal system of the U.S.-state and federal courts, judges, attorneys, and law enforcement personnel; civil and criminal law and procedure.

POLS 242 Introduction to World Politics (3) (Y) The theory and substance of international politics, with emphasis on the international behavior of nations. Topics include war, regional integration, the United Nations, and the gap between rich and poor nations.

POLS 251 Introduction to Comparative Politics (3) (S) Comparative study of politics, government, and economic development in several different countries including Britain, Japan, Russia, China, Mexico, India, and Egypt.

POLS 280 Methods of Research (3) (Y) The logic and approaches used by social scientists; concept formation, design of research projects, choice of techniques, and interpretation of results. Pre: POLS 101 or consent of instructor.

POLS 299 Directed Studies (1-3) (S) Statement of planned reading or research required. Pre: sophomore standing and consent of instructor.

POLS 300 History of Political Thought: Ancient to Modern (3) (AY) Political thought from ancient political philosophy to the advent of modern liberal democracy. Major thinkers include Plato, Aristotle, Machiavelli, Hobbes and Locke.

POLS 301 Liberalism and Its Critics (3) (Y) Liberalism and its ideological rivals: conservatism, communism and fascism. Precursors and exponents of these ideologies including Burke, Marx and Nietzsche.

POLS 320 Mock Trial (3) (Y) Experiential learning in a courtroom trial setting. Preparation includes knowledge of functions and roles of court personnel, elements of proof, techniques of direct and cross-examination. Includes role-playing in six mock trial cases.

POLS 321 Constitutional Law (3) (AY) Civil rights and civil liberties—the relationship between the individual and the government in such matters as freedom of expression, freedom of the press, religious freedom, the rights of the accused, freedom from discrimination, and the right of political participation. (Formerly POLS 421)

POLS 322 Criminal Justice (3) (Y) An examination of the criminal justice system, its structure and its function, with emphasis on the rights of the accused as exemplified in appellate court decisions. Pre: POLS 220 or consent of instructor. (Formerly POLS 422)

POLS 324 Crime and Delinquency (3) (IO) Crime and delinquency; types of adult and juvenile offenders; theories of crime and delinquency; police, courts, prisons, probation, and parole in relation to criminal and delinquent behavior. Pre: SOC 100 or consent of instructor (Same as SOC 324)

POLS 326 Juvenile Delinquency (3) (Y) Examination of the causes and control of juvenile delinquency. The major theories of juvenile delinquency will be reviewed. The course also will explore the organization and processes of juvenile justice. Pre: SOC 100 or consent of instructor. Offered Spring semester. (same as SOC 326)

POLS 331 Presidency and Congress (3) (AY) An examination of the institutions of the Presidency and the Congress and an analysis of the history, major office holders, processes, and functions of these American institutions.

- POLS 332 Politics of Race and Gender (3) (AY)** A survey of the historic, legal, political, and social forces shaping society's construction of race, ethnicity, and gender; notions of power and the political significance of race and gender are explored.
- POLS 334 Political Behavior, Campaigns and Elections (3) (AY)** An examination of the influence of individuals, interest groups, mass movements and elections on the democratic process. Topics include electoral rules, candidate strategies, campaign finance, voting, and political mobilization.
- POLS 335 Environmental Politics and Policy (3) (AY)** An examination of the major environmental and natural resource problems facing society today. Topics covered will include air and water pollution, energy development, and land use. (Formerly POLS 435)
- POLS 337 Politics of Hawai'i (3) (IO)** Hawai'i's political culture, leadership patterns and recruitment, voter participation in politics, role of institutions, voting analysis, local political parties, and interest groups.
- POLS 340 U.S. Foreign Policy (3) (Y)** The policy-making process with special attention to the role of the President, the Congress, the military, organized lobbies, and the public. Pre: POLS 101 or consent of instructor. (Formerly POLS 440)
- POLS 341 Women and War (3) (AY)** An examination of warfare and women's involvement in this activity. Attention given to military history, the organizational requirements of warfare, the effects of war on women and the changing role of women in the armed forces. (Same as WS 341)
- POLS 342 International Law (3) (AY)** Development, functions, and sources of public international law. Survey of major areas: law of the sea; laws of air and space; laws of warfare; pacific settlement of disputes; and rule-making in international organizations. Pre: POLS 242 or consent of instructor.
- POLS 345 Model United Nations (3) (S)** An examination of the organization of the United Nations, its rules of procedure and major UN issues. The course prepares selected students to represent the University at the National MUN (New York) or a major regional MUN. May be repeated three times for credit, but only (6) credits may be applied to the major.
- POLS 346 International Organizations (3) (Y)** Survey of the theories of international political integration, the United Nations and its specialized agencies, the European Union, NATO, the Organization of American States, OPEC, and other supraregional and regional economic, security and political international organizations.
- POLS 351 Politics of China (3) (AY)** Various aspects of contemporary Chinese politics in terms of elite patterns, institutional roles, and the responses by the masses. Areas to be covered include: Mao's ideology, shifts in development strategy, impact of the Cultural Revolution, and changes and reform under Deng Xiaoping. Pre: POLS 251 or consent of instructor.
- POLS 353 Politics of Japan (3) (Y)** Aspects of Japanese politics, emphasizing the post-1945 period. Topics include political development and change, the political economy of Japan, major political institutions and organizations, policy-making processes, and controversial political issues. (Same as JPST 353)
- POLS 355 International Political Economy (3) (AY)** Topics include world powers and the world economic systems, the third world economic development, political and economic reforms, and Asian development models. Pre: ECON 100, or POLS 242 or consent of the instructor.
- POLS 360 Public Administration (3) (Y)** Public administration as a major component in the American political process and of public policy making and the crucial role administrators play in that process.
- POLS 391 Internship (3-12) (S)** Application of knowledge and skills in a public, private, or government agency/setting. May be taken for a total of 12 credits, only six of which can apply to the Sociology major or three to the minor, and a total of 15 credits of POLS/SOC 391 and POLS 481 may be applied to the POLS major. Pre: consent of instructor, preapproved placement, statement of learning objectives, and completed internship contract. (Same as SOC 391)
- POLS 399 Directed Studies (1-3) (S)** Statement of planned reading or research required. Pre: junior standing and consent of instructor.
- POLS 402 Contemporary Political Thought (3) (AY)** Political thought from early 20th century existentialism to postmodernism, feminism, and neo-conservatism. Pre: POLS 300 or 301 or consent of instructor.
- POLS 433 Politics, Media and Public Opinion (3) (AY)** An examination of the role of mass media in shaping public opinion and influencing governance. Topics include the use of media by candidates, government officials and organized interests; media effects on individuals; determinants of public opinion; public opinion polling; and methods of public persuasion. Pre: POLS 101 or consent of instructor.
- POLS 442 War and the State (3) (AY)** An examination of the relationship between warfare and the modern state. Consideration given to the consolidation of power in national governments through the evolution of weapons technology and military organization. Also considered is the emergence of non-state actors—such as terrorist groups—whose activities challenge the nation-state.
- POLS 457 U.S.-China Relations (3) (Y)** This course surveys the history of U.S.-China relations to the present and gives in-depth consideration to contemporary issues including China's human rights record, the issue of Taiwan, U.S.-China trade relations, and China's global role in the 21st century.
- POLS 4705 Seminar in Political Science (3) (Y)** This is a capstone course that provides an intensive examination of the major concepts, categories and methods of political science. Topics include political ideologies, attitudes, voting behavior, institutions of government, public policy, law, justice and world politics. Pre: POLS 380 and senior-level status or consent of the instructor. Pre: POLS 280 and junior or senior standing.
- POLS 481 Government Internship (CR/NC only) (3-15) (S)** Juniors and seniors may apply for an internship with the Hawai'i County Council or, in the Spring, with the Hawai'i State Legislature. Legislative interns receive 15 semester hours of credit and a stipend. May be repeated once for credit, but no more than 15 credits of POLS 481 and/or POLS/SOC 391 shall apply to the major. Pre: consent of instructor.
- POLS 490 Senior Thesis (3) (S)** Individual research in problems of special interest. Pre: consent of instructor.
- POLS 494 Special Topics in Political Science (1-3) (AY)** Advanced topics chosen by the instructor. The course content will vary. It may be repeated for credit, provided that a different topic is studied.
- POLS 499 Directed Studies (1-3) (S)** Statement of planned reading or research required. Pre: senior standing and consent of instructor.

PSYCHOLOGY (PSY)

College of Arts and Sciences

- PSY 100 Survey of Psychology (3) (S)** Principles of human behavior, individual differences, motivation, emotion, perception, learning. This introductory course provides a general survey of the entire field of psychology and serves as the prerequisite for all upper-division psychology courses.
- PSY 199 Directed Studies (1-3) (S)** Permission of instructor and statement of planned reading or research required.
- PSY 213 Statistical Techniques (4) (S)** Frequency distributions; graphic methods; central tendency and variability; correlation and regression; inferential statistics; non-parametric statistics. Pre: two years of high school algebra or equivalent.
- PSY 214 Research Methodology (4) (S)** Methods of scientific observation, nature of experiments, the use of quasi-experimental designs, control group experimental designs, and single-subject experimental designs. Potentials and problems in research and clinical uses of these designs. Ethical considerations involved in conducting research. Pre: PSY 100, 213.
- PSY 299 Directed Studies (1-3) (S)** Statement of planned reading or research required. Pre: consent of instructor.

- PSY 311 Behavioral Assessment (3) (Y)** Principles, concepts, and methods for measuring overt, emotional, and cognitive behavior. Practical applications to self-observation and observation of others in natural situations and under planned behavior changes. Pre: PSY 100, 213, 214.
- PSY 312 Evaluation Research (3) (Y)** The application of research methods in the planning, monitoring and evaluation of social programs. Needs assessment, program monitoring impact assessment and efficiency analysis will be surveyed. Pre: PSY 100, 213, 214.
- PSY 313 Testing and Measurements (3) (Y)** Principles, concepts, and procedures of psychological testing, including construction, validation, interpretation, and use of tests in intellectual and personality assessment. Pre: PSY 100, 213.
- PSY 314 Learning and Motivation (3) (AY)** Major conditions influencing learning and forgetting; role of practice, reward, motivation, drive and emotion; theoretical interpretations of learning and motivation. Pre: PSY 100, 213, 214.
- PSY 314L Learning and Motivation Laboratory (1) (IO)** Laboratory to accompany PSY 314.
- PSY 315 Sensation and Perception (3) (Y)** Psychophysics, vision, audition, taste, smell, theories of perception. Pre: PSY 100, 213, 214.
- PSY 319 Experimental Psychology (3) (Y)** Original experiments with emphasis upon laboratory techniques. Control of variables, apparatus design, statistics in research. Pre: PSY 100, 213, 214.
- PSY 320 Developmental Psychology (3) (S)** Emotional, mental, physical, social development from infancy to adulthood; interest and abilities at different age levels. Pre: PSY 100.
- PSY 321 Psychology of Personality (3) (S)** Scientific study of personality through examination of major theoretical approaches: personality functioning, development, and change; assessment and research strategies; empirical data on central concepts and social-cultural determinants. Pre: PSY 100.
- PSY 322 Social Psychology (3) (Y)** Interpersonal relations, social attitudes; group dynamics; intergroup relations, class and cultural influences. Pre: PSY 100.
- PSY 323 Community Psychology (3) (IO)** Community factors such as urbanization, social service programs, and schools as they affect the psychological well-being of individuals. Social system intervention techniques to better the fit between individuals and environments. Pre: PSY 100.
- PSY 324 Abnormal Psychology (3) (S)** Nature and causes of psychotic, neurotic, intellectual, and other psychological disorders. Definition, assessment, and diagnosis of abnormality. Psychotherapy, chemotherapy, and other treatment alternatives. Prevention, legal, and societal issues. Pre: PSY 100.
- PSY 325 Psychology of Women (3) (IO)** Issues and topics relevant to the psychological development and functioning of women including sex differences in abilities and behavior, achievement motivation, work, sexuality, pregnancy, childbirth and motherhood, mental health and domestic violence. Pre: PSY 100. (Same as WS 325)
- PSY 333 Psycholinguistics (3)(Y)** Theory and method in the investigation of the relationship between language and cognition, first-and-second language acquisition, speech pathologies. Pre: LING 102 OR PSY 100 or consent of instructor. (Same as LING 333)
- PSY 350 Cognitive Psychology (3) (IO)** Theories, assumptions, empirical findings, and applications of cognitive psychology. Topics include memory, inference, prediction, and mental imagery. Pre: PSY 100.
- PSY 352 Introduction to Biopsychology (3) (Y)** Survey of the study of behavior from the viewpoint of the natural sciences. Genetics, neural mechanisms, pharmacology, and biological development of behavior will be discussed. Pre: PSY 100. Offered in spring semester only.
- PSY 360 Cross-Cultural Psychology (3) (Y)** Application of psychological methodology and theories to the study of behavior in selected cultures, with a focus on Polynesia. Topics to include child-rearing and socialization, cognition, personality, and social behavior patterns. Pre: PSY 100 and upper division standing.
- PSY 365 Psychology of Religion (3) (Y)** An introduction to the topic of psychology of religion, emphasizing an empirical approach. Core themes and concepts of the field are explored, as are prominent theories and the underlying assumptions thereof. Recent developments and empirical findings also are considered, including those from neuroscience. Socio-cultural implications of past and present work in the field are discussed. Offered in Spring semester only.
- PSY 370 Sport Psychology (3) (Y)** Survey of methods and findings in the application of psychological principles in sport. Topics include arousal and anxiety, cognitive processes, team performance, coaching behavior and techniques to maximize sports performance. (Same as HPE 370)
- PSY 370L Sport Psychology Laboratory (1) (IO)** Laboratory to accompany PSY 370.
- PSY 377 Counseling Psychology (3) (Y)** This course covers the various theoretical approaches to counseling, the therapeutic relationship, techniques of counseling, ethical issues, research, diagnosis and assessment, cross-cultural counseling, as well as career, family and couples, and group interventions. Pre: PSY 100.
- PSY 380 Health Psychology (3) (Y)** Psychosocial factors in physical health, illness, and the health care system. Topics include stress and coping, personality and social factors affecting health, adaptation to chronic illness, death and dying, patient-practitioner relationships, the institutional context, and health promotion. Pre: PSY 100.
- PSY 385 Women and Health (3) (Y)** Reproductive health, immune activity, autoimmune disease and mental health in women are covered from physiological, psychological, historical and cross-cultural perspectives. (Same as WS 385) Pre: PSY 100.
- PSY 390 Industrial and Organizational Psychology (3) (Y)** The application of the methods, facts, and principles of psychology to people at work in diverse group and organizational settings.
- PSY 394 Special Topics in Psychology (1-3) (Y)** Intermediate-level topics chosen by the instructor, with course content varying with each offering: (A) applicable to Block 1 of major requirements, (B) applicable to Block 2 of major requirements. May be repeated for credit, provided that a different topic is studied. Pre: junior standing or consent of instructor.
- PSY 399 Directed Studies (1-3) (S)** Statement of planned reading or research required. Pre: consent of instructor.
- PSY 416 Emotion (3) (Y)** A comprehensive introduction to the topic of emotion as it has been treated in the field of psychology. Different theories and approaches to the scientific study of emotion, including basic neuroscientific principles and recent human brain imaging techniques are discussed. Pre: PSY 352 or consent of instructor. Offered in Fall semester only.
- PSY 420 Adolescent Development and Mental Health (3) (Y)** Normative and problematic development during adolescence. Cross-cultural differences and similarities in adolescent development. Theoretical approaches to adolescent mental health. Causes and effects of maladjustment. Approaches to prevention and intervention. Pre: PSY 214, PSY 320.
- PSY 425 Career Development (3) (Y)** Work-related behavior over the span of life. Theory, research, and counseling about career development. Work values, career goals, career decision-making, and occupational choice. Work adjustment and satisfaction. Work within the context of human lives. Interaction between career development processes and other domains of life, such as family, education, leisure, etc. The course is run as a seminar with an emphasis put on discussion. Pre: PSY 214, PSY 320.
- PSY 430 Physiological Psychology (3) (AY)** Relationship between physiology and behavior. Topics include neuroanatomy, the hormone systems associated with feeding, drinking, reproduction, aggression, and stress, and the neurological and hormonal basis of mental disorders. Pre: PSY 100, 213, 214, or consent of instructor.
- PSY 430L Physiological Psychology Laboratory (1) (AY)** Laboratory to accompany PSY 430.

- PSY 432 Psychology of Motivation (3) (Y)** Theories of arousal and activation, incentive and reinforcement, and behavior suppression. Pre: PSY 100 and consent of instructor.
- PSY 432L Psychology of Motivation Lab (1) (IO)** Laboratory to accompany PSY 432.
- PSY 435 Animal Psychology (3) (AY)** Biological, ecological, social and learned bases of animal behavior based on laboratory and field investigations. Pre: PSY 100, 213, and 214, or consent of instructor. Co-requisite: PSY 435L.
- PSY 435L Animal Psychology Laboratory (1) (AY)** Laboratory to be taken concurrently with PSY 435.
- PSY 440 History of Psychology (3) (AY)** Historical origins and development of contemporary psychology. Pre: 12 semester hours in psychology.
- PSY 445 Practicum in Psychology: Field (4) (S)** Supervised experience in human service, mental health, and other community agencies in the local community. Pre: 12 semester hours in psychology and consent of instructor.
- PSY 450 Child Behavior Therapy (3) (AY)** Theory, research, and practice in cognitive behavior therapy applied to child disorders and problems. Treatment applications of reinforcement, extinction, punishment, modeling, self-instruction and other cognitive strategies. Pre: PSY 320.
- PSY 451 Adult Behavior Therapy (3) (AY)** Theory, research, and practice in cognitive behavior therapy applied to adult disorders and problems. Treatment applications of relaxation, exposure and prevention, desensitization, aversion therapy, biofeedback, self-control, imagery and cognitive strategies. Pre: PSY 324.
- PSY 454 Methamphetamine: Clinical and Forensic Aspects (3) (Summer)** Effects and consequences of methamphetamine from both psychological and biological perspectives. Methamphetamine, politics, and the law. Implications for substance abuse treatment will be discussed. Pre: PSY 352 or consent of instructor.
- PSY 470 Clinical Psychology (3) (Y)** Nature, history, and contemporary state of the profession of clinical psychology. Theories, methods, and findings in assessment, intervention, research, and clinical practice. Multiple roles of the clinical psychologist, ethical and professional issues, standards of care, legal regulation of practice, and the mental health care system. Pre: PSY 324.
- PSY 471 Child Abuse and Neglect (3) (Summer)** A survey of topics related to physical, sexual, and psychological child abuse and child neglect, including: the prevalence and incidence of different forms of abuse and neglect, scientific theories and findings about the causes and consequences of abuse and neglect, forensic and clinical assessment of abuse and neglect, mandated reporting and other legal issues, and psychological interventions for abused and neglected children and their families. Pre: PSY 324.
- PSY 475 Asian American Psychology (3) (IO)** The course examines the personality and mental health issues of Asian Americans. Special emphasis is given to how minority group status, adaptation processes, and bicultural development influence various aspects of psychological functioning. Specific topics include stereotypes and racism, acculturation and enculturation, cultural values and behavioral norms, family roles, ethnic identity, communication styles, gender and interracial relationships, academic and career achievement, stressors and social support systems, psychopathology, and culturally competent mental health treatment. Pre: PSY 100 and either PSY 360 or consent of instructor.
- PSY 489 Research Seminar (3) (S)** Research in Psychology. Statement of 3 semester hours of planned reading or research required. Attendance at bimonthly seminar required. Seminars include lectures, discussions and research reports of topics in psychology presented by faculty, students, and visiting scholars. Pre: Consent of instructor.
- PSY 494 Special Topics in Psychology (1-3) (Y)** Advanced-level topic chosen by the instructor, with course content varying with each offering: (A) offering applicable to Block 1 of major requirements, (B) offering applicable to Block 2 of major requirements. May be repeated for credit, provided that a different topic is studied. Pre: senior standing or consent of instructor.

- PSY 499 Directed Studies (1-3)** Statement of planned reading or research required. Pre: PSY 489 and consent of instructor.

QUANTITATIVE BUSINESS ANALYSIS (QBA)

College of Business and Economics

- QBA 260 Business Statistics (3)(S)** Application of statistics to business. Includes an introduction to probability and sampling; descriptive statistics, inference, regression and one-way analysis of variance. Pre: CoBE Computer Competency certification and one MATH course numbered 104F, 115, 205, or higher.
- QBA 360 Management Science (3)(S)** Mathematical modeling of business decisions. Classical multivariable optimization, linear programming, decision theory, simulation, and additional selected topics. Pre: Admission to Professional Business Program, QBA 260.
- QBA 361 Operations Management (3) (S)** The design, control and evaluation of service and product delivery systems. Topics include services design, facilities, design and location, capacity planning, demand management, yield management, inventory and supply chain management, project management, and productivity and quality measurement. Pre or Co-req: Admission to Professional Business Program, QBA 360.
- QBA 362 Management Information Systems (3) (S)** Examination of business information subsystems and the role of computers in accounting, marketing, production, and financial subsystems; theory of general management information systems. Pre: Admission to Professional Business Program
- QBA 363 Decision Analysis (3) (AY)** Modeling of decisions using decision trees, backwards induction, and utility functions. Topics include the use of Bayes' Theorem, structuring decisions, univariate and multi-attribute utility functions, the value of information, sensitivity analysis, and behavioral aspects of decision making. Pre: Admission to Professional Business Program, QBA 260.
- QBA 364 Business Database Management (3) (AY)** The use of computer based systems for business transaction processing and data management. Topics include file structure, database concepts, end-user programming tools, interface design, system analysis and design, and data management issues including privacy, security, integrity, law, and ethics. Pre: Admission to Professional Business Program, QBA 362.
- QBA 365 Managing Electronic Commerce (3) (AY)** Topics in advanced electronic commerce (EC) management. Issues include: defining EC in its various forms; exploring EC strategies; economics of EC; global EC issues. The class will complete a semester-long hands-on project requiring students to: assess a business' needs and opportunities; plan a Web site corresponding to the needs assessment; implement a fully functional and interactive commercial Web site; plan and implement administrative parameters and functions for customer service, security, site monitoring, site maintenance, business performance, and site effectiveness. Pre: Admission to Professional Business Program, CS 201 and MKT 318, or QBA 362.
- QBA 399 Directed Studies (1-3)** Statement of planned reading or research required. Pre: junior standing and consent of instructor.
- QBA 494 Special Topics in Quantitative Business Analysis (1-3)** Advanced topics chosen by the instructor. The course content will vary. It may be repeated for credit, provided that a different topic is studied. Pre: Admission to Professional Business Program, varies with topic.
- QBA 499 Directed Studies (1-3)** Statement of planned reading or research required. Pre: Admission to Professional Business Program, senior standing and consent of instructor.

SOCIOLOGY (SOC)

College of Arts and Sciences

- SOC 100 Principles of Sociology (3) (S)** An introduction to the theories, scientific methods and empirical findings of contemporary sociology.
- SOC 200 Career Opportunities in Sociology (1) (Y)** A forum for the presentation of career opportunities for Sociology majors and minors. The course features speakers, and the development of practical profes-

- sional skills, including writing a resume. Offered on a CR/NC basis only. Required for Sociology majors and minors. (Formerly SOC 490)
- SOC 240 Social Psychology (3) (AY)** An introduction to how sociologists view the relationship between social institutions, social groups and individual actions.
- SOC 260 Social Problems (3) (IO)** An introduction to the study of social problems in contemporary society, including their nature, sociological causes and possible solutions. Course may focus on a single social problem.
- SOC 280 Statistical Reasoning in Social Inquiry (3) (Y)** An introduction to basic descriptive, correlational, and inferential statistics used in the social sciences and education. Must be taken concurrently with SOC 280L.
- SOC 280L Laboratory in Statistical Reasoning (1)** An introduction to the techniques and usage of statistical applications involving computation and interpretation of statistics.
- SOC 300 Family in World Perspective (3) (Y)** A comparative analysis of family and marriage patterns, mate selection, parent-child interaction, divorce rates, socialization of gender roles, legal sanctions, trends in organization and function. Pre: SOC 100 or consent of instructor.
- SOC 301 Introduction to Social Work (3) (Y)** The sociological analysis of social welfare institutions and their relationship to meeting human needs and solving social problems. Course designed for students intending careers in the helping professions. Pre: SOC 100 or consent of instructor.
- SOC 305 Organizational Theory and Analysis (3) (AY)** Contemporary theories and techniques used in the analysis of organizations. Designed for students intending careers in administration or the human services. Pre: junior standing or consent of instructor.
- SOC 310 Race and Ethnic Relations (3) (AY)** Sociological analysis of the patterns of intergroup relations. Topics include the meaning of race, ethnicity, prejudice and discrimination, and the interactive strategies used by various groups. Emphasis on ethnic processes on Hawai'i and the Pacific region. Pre: SOC 100 or consent of instructor.
- SOC 320 Social Stratification (3) (AY)** The causes and consequences of institutionalized social inequality. Pre: SOC 100 or consent of instructor.
- SOC 324 Crime and Delinquency (3) (IO)** Crime and delinquency; types of adult and juvenile offenders; theories of crime and delinquency; police, courts, prisons, probation, and parole in relation to criminal and delinquent behavior. Pre: SOC 100 or consent of instructor. (Same as POLS 324)
- SOC 326 Juvenile Delinquency (3) (Y)** Examination of the causes and control of juvenile delinquency. The major theories of juvenile delinquency will be reviewed. The course also will explore the organization and processes of juvenile justice. Pre: SOC 100 or consent of instructor. Offered Spring semester. (same as POLS 326)
- SOC 340 Socialization and Identity (3) (AY)** The process by which an individual becomes a functioning member of society. Pre: SOC 100 or consent of instructor.
- SOC 342 Sociology of Human Aging (3) (AY)** Aging as a social phenomenon, including social impact of a growing elderly population, and emerging social patterns among the elderly. Emphasis on the interplay of biological, psychological, sociological and cultural factors of human aging. Pre: SOC 100 or consent of instructor.
- SOC 345 Human Populations (3) (AY)** Introduction to population theories and sociological research on population distribution, composition, and change within global and local contexts. Pre: SOC 100 or consent of instructor.
- SOC 352 Sociology of Education (3) (AY)** Formal education as an aspect of socialization. Emphasis is on the American system from an historical and comparative perspective. Pre: SOC 100 or consent of instructor.
- SOC 355 Sociology of Religion (3) (IO)** A comparative analysis of religion. Topics include religious movements, secularization and social change, conversion and faith dynamics, and meaning and belonging functions. Case studies drawn from different societies and historical periods. Pre: SOC 100 or consent of instructor.
- SOC 357 Introduction to Family Therapy (3) (IO)** An introduction to marriage and family therapy including the profession's history, foundational theories, ethics, and demonstrations of skills used by marriage and family therapists to help individuals, couples, and entire families deal with psychological, emotional, and behavioral problems. Pre: SOC 100 or consent of instructor.
- SOC 365 Sociology of Deviance (3) (Y)** This course examines social deviance, focusing on theory and contemporary research in the field. Topics to be covered may include sexual deviance, physical and cognitive deviance, substance use, and mental illness. Pre: SOC 100 or consent of instructor.
- SOC 370 Political Economy of Hawaii (3) (Y)** An exploration into the political and economic processes of Hawaii and how the two interrelate and affect each other. Emphasis on current issues and practices as well as processes. Pre: SOC 100 or consent of instructor. Spring semester only.
- SOC 380 Methods of Research (3) (Y)** A survey of the logic, purposes, techniques, terminology, and issues of social research methodology. Pre: SOC 100, 280 and 280L or consent of instructor.
- SOC 390 Sociological Theory (3) (Y)** A critical examination of the theoretical foundations of contemporary sociological theories. Beginning with Marx, Weber, Durkheim, and Simmel, examines contemporary examples of social theory, including post-structuralism, critical theory, hermeneutics, and phenomenology. Pre: SOC 100 or consent of instructor.
- SOC 391 Internship (3-12) (S)** Application of knowledge and skills in a public, private, or government agency/setting. May be taken for a total of 12 credits, only six of which can apply to the Sociology major or three to the minor, and a total of 15 credits of POLS/SOC 391 and POLS 481 may be applied to the Political Science major. Pre: consent of instructor, preapproved placement, statement of learning objectives, and completed internship contract. (Same as POLS 391.)
- SOC 394 Special Topics in Sociology (1-3)** Topics chosen by the instructor. Course content will vary and may be repeated for credit, provided that a different topic is studied. Pre: SOC 100, junior standing, or consent of instructor.
- SOC 399 Directed Studies (1-3)** Statement of planned reading or research required. Pre: SOC 100, junior standing, or consent of instructor.
- SOC 400 Seminar in Social Psychology (3)** The relationship between social pressures/structure and the individual. Emphasis upon current research and theory in the area. Pre: SOC 100 or SOC 240 or consent of instructor.
- SOC 405 Seminar in Social Organization (3)** Social organization in all its forms, dynamics, and structures. While appealing to an historical and comparative perspective, primary attention will be directed to contemporary forms of social organization with an emphasis upon current research and theory in the area. Pre: SOC 100 or consent of instructor.
- SOC 420 Seminar in Social Institutions (3)** Institutions in contemporary society, with focus upon the processes and structures of modern institutions such as the polity, economy, health care, and law. Emphasis upon current research and theory in the area of specific institutions examined. Pre: SOC 100 or consent of instructor.
- SOC 430 Seminar in Social Change (3)** Change in human societies from a comparative and historical perspective. Topics covered include modernization, development, tradition, and secularization. Emphasis upon current research and theory in the area. Pre: SOC 100 or consent of instructor.
- SOC 480 Practicum in Social Research (3)** Direct involvement in all facets of the research process. Students have the option of working on their own projects or on projects initiated by the faculty. May be counted only once toward the required 35 semester hours of the major, but may be repeated once for upper division credit. Pre: SOC 280 and 380 or consent of instructor.
- SOC 494 Special Topics in Sociology (1-3)** Advanced topics chosen by the instructor. The course content will vary and may be repeated for credit, provided that a different topic is studied. Pre: SOC 100, senior standing, or consent of instructor.

SOIL SCIENCE (SOIL)**College of Agriculture, Forestry and Natural Resource Management**

SOIL 304 Tropical Soils (2 lec., 1 lab) (3) (S) Origin, development, properties, classification, use and management of soils with emphasis on applications in the tropics. Pre: CHEM 124 or consent of instructor.

SOIL 350 Soil Fertility and Nutrient Cycling (2 lec. 1 lab) (3) (Y) Nutrient availability in relation to chemical and physical properties of tropical soil; fertility evaluation by plant response and soil tests; cycling of carbon, nitrogen, and minerals; nutrient management for enhanced plant productivity and maintenance of environmental and soil quality. Pre: CHEM 124 or consent of instructor. SOIL 304 recommended.

SPANISH (SPAN)**College of Arts and Sciences, Languages**

Students who have demonstrated competence in Spanish in high school will not be admitted to SPAN 101 and must take a placement test before enrolling in a course in Spanish.

SPAN 101-102 Elementary Spanish (4-4) Yr. (S) Beginning course, primarily emphasizing oral practice. Laboratory drill.

SPAN 201-202 Intermediate Spanish (4-4) Yr. (Y) Continuation of oral practice with increasing emphasis on reading and written composition. Laboratory drill.

SPAN 299 Directed Studies (1-3) Permission of the instructor and statement of planned reading or research required. Pre: sophomore standing.

SPAN 394 Special Topics in Spanish (1-3) (IO) Advanced topics chosen by the instructor. Course content will vary. May be repeated for credit, provided that a different topic is studied. Pre: junior standing or consent of instructor.

SPAN 399 Directed Studies (1-3) Permission of the instructor and statement of planned reading or research required. Pre: junior standing.

SPAN 499 Directed Studies (1-3) Permission of the instructor and statement of planned reading or research required. Pre: senior standing.

TOURISM (TOUR)**College of Business and Economics**

TOUR 317 Marketing and Management of Travel and Tourism (3) (AY) Principles of marketing and management applied in hotel/motel, resort, restaurant, travel, transportation, tourism and leisure industries. Course looks at who travels, where and why. Focus is on cases involving both small and large firms in the travel and tourism area. Pre: Admission to Professional Business Program, MKT 310.

TOUR 320 Tourism Economics (3) (AY) Microeconomics of travel: determinants of demand, empirical studies, demand forecasting; production cost analysis, market structure in major travel industries. Macroeconomic impacts. Pre: Admission to Professional Business Program, ECON 130.

TOUR 340 International Travel and Tourism Policy (3) (AY) Tourism in international trade, legal environment of international travel, political implications of tourism, social and cultural aspects of tourism, public and private policy issues for developed and developing destinations. Pre: Admission to Professional Business Program, junior standing.

TOUR 399 Directed Studies (1-3) Statement of planned reading or research is required. Pre: Admission to Professional Business Program, junior standing and consent of instructor.

TOUR 494 Special Topics in Tourism (1-3) Advanced topics chosen by the instructor. The course content will vary. It may be repeated for credit, provided that a different topic is studied. Pre: Admission to Professional Business Program, varies with topic.

TOUR 499 Directed Studies (1-3) Statement of planned reading or research is required. Pre: Admission to Professional Business Program, senior standing and consent of instructor.

UNIVERSITY (UNIV)**College of Arts and Sciences**

UNIV 101 Freshman Experience Seminar (3) Designed to assist first year students in knowing UH Hilo, its programs, services, and place in the tradition of higher education. Students will learn about their role, the skills they will need, expectations of others, career options, and the student's contributions to this multicultural setting. Admission is generally limited to classified freshman students.

WOMEN'S STUDIES (WS)**College of Arts and Sciences**

WS 151 Introduction to Women's Studies (3) (S) An interdisciplinary survey of women in contemporary society. Topics include issues in history, biology, psychology, education, communication, feminism, ethnicity and gender which impact on women's lives in modern culture.

WS 299 Directed Studies (1-3) (S) Topics will be chosen by the instructor. The course content will vary. Course may be repeated for credit, provided that a different topic is studied. Pre: consent of instructor.

WS 319 European Women's History (3) (AY) Study of European women from pre-history to the 20th century with emphasis on women's social and cultural roles in western history. Current feminist theory is also studied. (Same as HIST 319)

WS 320 Cross-Cultural Study of Women (3) (AY) Comparative analysis of women's roles and women's lives in different societies. Topics include women's status, life stages, gender roles, images of women and power. (Same as ANTH 320).

WS 324 Culture, Sex and Gender (3) (AY) A cross-cultural examination of the development of gender systems and gender roles. Consideration of sex roles and activities as part of the larger gender system. Pre: ANTH 100 or consent of instructor. (Same as ANTH 324).

WS 325 Psychology of Women (3) (IO) Issues and topics relevant to the psychological development and functioning of women including sex differences in abilities and behavior, achievement motivation, work, sexuality, pregnancy, childbirth and motherhood, mental health and domestic violence. Pre: PSY 100. (Same as PSY 325)

WS 341 Women and War (3) (Y) An examination of warfare and women's involvement in this activity. Attention given to military history, the organizational requirements of warfare, the effects of war on women and the changing role of women in the armed forces.

WS 355 Women in Modern Literature and Film (3) (AY) Literature and film by and about women from 1900 to the present. Feminist literary theory. Pre: ENG/ESL 100 and 200-level literature course or college level Women's Studies courses or consent of instructor. (Same as ENG 355)

WS 356 Language and Gender (3) (AY) Students engage in the analysis of gender as it relates to language and society. Provides students with analytic resources for thinking critically about the relationship between language and social practice. Students gather and analyze data based on current theories. Pre: ENG 100/ESL 100 and LING 102 or consent of instructor. (Same as LING 356, ENG 356)

WS 357 Women and Religion (3) (Y) Examines roles of, and attitudes toward, women in various religious traditions. Through both chronological and comparative approaches, explores depictions of women in scriptures and other primary texts as well as women's contributions to each tradition.

WS 358 Women in Christianity (3) (Y) Examines issues relating to sex and gender throughout the history of Christianity. Emphasizing primary texts, the course will explore writings by Christian women and Christian writings about women. Offered Fall semester. (same as HIST 358)

WS 360 American Women's History (3) (AY) Study of American women from the 17th to the 20th centuries. Special emphasis on women's social and cultural roles. Current feminist theory is also studied. Pre: HIST 151, 152 or consent of instructor. (Same as HIST 360)

WS 385 Women and Health (3) (Y) Reproductive health, immune activity, autoimmune disease, and mental health in women are covered from physiological, psychological, historical and cross-cultural perspectives. Pre: PSY 100. (Same as PSY 385)

WS 392 Japanese Women (3) (AY) History of women in Japan from the earliest historical eras, including the Heian aristocracy and evolving samurai culture, through the present. Topics include property rights, family structures, the influence of religion and secular philosophies, effects of political and legal changes, women's role in the economy and its effect on their status and lives, and women's activism. (Same as JPST 392 and HIST 392)

WS 393 Normality, Abnormality, and Society (3) (Y) Philosophical study of how human diversity interacts with social norms. Topics include health and illness, disability, gender and sexual orientation. Perspectives from biology and the social sciences are included in a study of how beliefs about normality vary between cultures, change through time and affect human relations. Pre: Previous work in Philosophy. (Same as PHIL 393.)

WS 394 Special Topics (3) (Y) Advanced topics will be chosen by the instructor. The course content will vary. Course may be repeated for credit, provided that a different topic is studied. Pre: consent of instructor.

WS 399 Directed Studies (1-3) (S) Statement of planned reading or research required. Pre: consent of instructor.

WS 420 Family Communication (3) (AY) Foundational concepts and theories are introduced. Communication dynamics within families are explored. Narrative, functional, interpretive, and systems approaches to family communication are included. Cultural influences are examined. Conditions necessary for optimal family functioning are addressed. (Same as COM 420)

WS 430 Gender, Place, and Environment (3) (Y) Surveys of trends in geography of gender related to place, space, and the environment. Addresses spatial interactions of gendered bodies of different ages, class, and ethnicities. Pre: Junior or Senior standing or one college level course in Women's Studies or consent of instructor. Offered in Spring semester only. (Same as GEOG 430)

WS 480 Women and Rhetoric (3) (AY) Survey of key female figures that have figured (or not figured) into the rhetorical canon. Analysis of women's use of rhetoric in everyday life and at historic moments and consideration of methodological and theoretical issues intersecting women, rhetoric, and historical research. Pre: ENG 100/ESL 100 and ENG 287 or 315 or consent of instructor. (Same as ENG 480)

WS 486 Women in Ancient European Civilization (3) (AY) Study of European women up to the year 800, with primary focus on the Mediterranean Basin. Themes encompass religion, social customs, and economic activities. Pre: One of the following 300-level courses (HIST 319, 323, 341, 356, or 360) or consent of instructor. Same as HIST 486.

WS 494 Special Topics (3) (Y) Advanced topics will be chosen by the instructor. The course content will vary. Course may be repeated for credit, provided that a different topic is studied. Pre: consent of instructor.

WS 495 Women's Studies Seminar (3) (Y) Capstone seminar to be taken in the senior year (or as a second-semester junior). Readings, discussions, presentations, and guest lectures involving advanced analysis of theories about social systems and women's lives. Seminar will facilitate students' application of theoretical material and research toward particular areas of interest. Seminar topics may vary from year to year. Pre: WS 151; 6 credits of upper-division WS courses or consent of the instructor.

WS 499 Directed Studies (1-3) (S) Statement of planned reading or research required. Pre: consent of instructor.