

Accounting (ACC)

College of Business Administration

ACC 201 Introduction to Financial

Accounting (3) Introduction to financial accounting and methods used to record and report financial information to decision makers external to the firm. Use and limitations of financial reports. Pre: sophomore standing.

ACC 202 Introduction to Management

Accounting (3) Introduction to managerial accounting and methods used to report information to decision makers internal to the firm. Cost accounting, budgeting, standard cost systems, reporting and analyzing performance. Pre: 201.

ACC 305 Management Accounting (3)

Information for managerial decision-making, planning, and control: job order and process costing, direct and absorption costing, normal and standard cost systems. Problem solving and application. Pre: 202.

ACC 321 Intermediate Financial Accounting

I (3) Accounting process and the application of GAAP to the recognition and measurement of cash, receivables, inventories, property plant and equipment, depreciation and depletion, intangibles, and current liabilities. Pre: 202.

ACC 323 Intermediate Financial Accounting

II (3) Application of GAAP to the recognition and measurement of long-term liabilities, investments, contributed capital, retained earnings, accounting changes and errors, income recognition, accounting for income taxes, pensions, leases, and statement of cash flows. Pre: 321 with "C" or better.

ACC 399 Directed Reading and Research (V)

Reading and research of a special area in major under direction of faculty member(s). Project must include statement of objectives, outline of activities planned, results expected, and how they are to be reported and evaluated. Must be approved in advance by the department chair and faculty adviser.

ACC 401 Federal Individual Income

Taxation (3) Examines federal income tax concepts, such as gross income, exclusions, deductions, exemptions, and tax credits, especially for sole proprietors. Introduces taxation of property transactions. Pre: 202 or BUS 610.

ACC 407 Taxation of Business Entities (3) A

A survey of the general concepts, rules, and practices involved in the taxation of sole-proprietorships, corporations, partnerships, and subchapter S corporations. Pre: 401.

ACC 409 Accounting Information Systems

(3) Accounting systems analysis, control and design in manual and computerized environments. Knowledge and skills of information technology for auditing AIS systems. Hands-on experience with microcomputers and a computerized accounting system. A-F only. Pre: 323 (or concurrent).

ACC 413 Law for the Accountant (3)

Intensive study of areas of law importance to accountants. Particular attention is given to principles of law relating to contracts, sales, commercial paper, secured transactions, property, legal entities, agency, securities, and accountant's legal liability. Pre: BLAW 200 or consent.

ACC 415 Advanced Financial Accounting (3)

Accounting topics relating to consolidation requirements and introduction to the fundamentals of fund accounting, including the general fund, restricted funds, debt service funds, enterprise funds, general long-term account group, general fixed assets accounting group, and accounting entries for encumbrances. Pre: 323.

ACC 416 Special Topics in Accounting (3)

This course addresses current issues impacting the accounting profession. Topics vary each semester. Repeatable three times. Pre: 323.

ACC 418 Auditing (3)

Auditing concepts including standards, objectives and ethics for external auditors. Emphasis on reporting standards, internal control, evidence, statistical sampling, IT audits and assurance. Pre: 323 and 409.

ACC 425 Accounting for Entrepreneurs (3)

Accounting, tax and legal issues encountered by individuals who start a new business. Stresses accounting controls, accounting software, taxes, and reporting requirements for state and local governments that would be encountered by entrepreneurs. Pre: 202.

ACC 481 Financial Accounting I (5)

Accounting process and the application of GAAP to the recognition and measurement of cash, receivables, inventories, property plant and equipment, depreciation and depletion, intangibles, current liabilities, and long-term liabilities. A-F only.

ACC 482 Financial Accounting II (5)

Application of GAAP in recognition and measurement of investments, pensions, retained earnings, and other topics related to financial statements. Other topics include consolidation and mergers and acquisitions. A-F only. Pre: 481.

ACC 483 Cost Accounting (5) Information for managerial decision-making, planning and control, job order and process costing, direct and absorption costing, standard and normal cost systems. Will also cover Government and Non-profit topics. A-F only.

ACC 484 Regulation and Accounting (5)

This course will cover tax accounting topics for individuals, estates, and business entities. It will also cover business law and professional responsibility topics important for the professional accountant. A-F only. Pre: 481.

ACC 485 Auditing and Attestation (4)

Concepts include standards, objectives, and ethics for external auditors. Emphasizes reporting standards, internal control, statistical sampling, EDP audits, and assurance. Also covers information systems and relevant measurement topics. A-F only. Pre: 481.

ACC 500 Master's Plan B/C Studies (1)

Enrollment for degree completion. Pre: master's Plan B or C candidate and consent.

ACC 606 Tax Research (3)

In-depth examination of tax research, IRS administrative procedures, and potential penalties. Extensive practice in issue spotting, reading and analyzing primary authority, and communicating results. Pre: 401.

ACC 609 Advanced Accounting Information

Systems (3) The development, implementation and operation of enterprise-wide resource planning systems, with an emphasis on

implications to accounting information. Also covers current and emerging issues relating to accounting information systems. Pre: 409.

ACC 619 Advanced Auditing (3) Advanced auditing course using research, critical thinking and communication skills applied to contemporary accounting and auditing. Pre: 418.

ACC 620 Global Accounting (3) Theory and fundamental causes of international variations in accounting. Special emphasis on problems such variations create for financial reporting, control, and decision-making within multinational business enterprises. Pre: 323, or consent.

ACC 625 Accounting and Tax Research (3)

In-depth examination of tax and accounting research, IRC, and SEC procedures. Extensive practice in issue identification, reading and analyzing primary authority, and communicating results. Credit not given for both 606 and 625. Pre: 401.

ACC 631 Tax of Partners/Partnerships (3)

Examines advanced topics in federal taxation of partners and partnerships regarding the contribution, operation, and distribution from partnerships and transfers of partnership interests. Pre: 606 or 625, and 407.

ACC 633 Advanced Corporate Taxation (3)

Examines tax advanced topics in corporate taxation, such as corporate reorganizations and divisions. Pre: 407, and 606 or 625.

ACC 635 Advanced Public Sector Account-

ing (3) Provides the tools necessary for understanding the principles of fiscal accountability and reporting in governmental and non-for-profit organizations. Pre: 415.

ACC 638 Estate and Gift Taxation and

Planning (3) Examines estate and gift tax provisions and basic estate planning techniques to save taxes and avoid probate. Overviews generation-skipping transfer taxes and income taxes on estates and trusts. Pre: 401 and either 407, 606, or consent.

ACC 639 Multijurisdictional Taxation (3)

Examines international, state, and local tax issues. Topics include U.S. International taxation of in- and out-bound transactions, sourcing of income and deductions and nexus. Pre: 401.

ACC 660 Analysis and Decision-Making (3)

Integrates learning through analysis and communication of comprehensive business problems. Stresses research, critical thinking, and analytical and communication skills applied to contemporary accounting and tax issues. Pre: 407 or 606, and 619 (or concurrent), or consent.

ACC 690 Current Topics in Accounting (3)

Concentration on current issues impacting the accounting profession. Topics vary each semester. May be repeated for credit.

ACC 695 Accounting Internship (3)

On-the-job experience in the accounting community. Necessary evaluation reports and meetings with faculty adviser required. Pre: consent.

ACC 701 Financial Accounting Research (3)

Course provides an overview of financial accounting research. Specific research studies are examined as to their theoretical basis, design, implications, methodology, relevance, etc. Repeatable one time. A-F only. Pre: PhD student status in international management or consent.

ACC 702 Managerial Accounting Research (3) Course provides an overview of managerial accounting research. Specific research studies are examined as to their theoretical basis, design, implications, methodology, relevance, etc. A-F only. Pre: PhD student status in international management or consent.

ACC 703 Research in Behavioral Accounting (3) Course provides an overview of accounting research in behavioral accounting topics. Specific research studies are examined as to their theoretical basis, design, implications, methodology, relevance, etc. A-F only. Pre: PhD student status in international management or consent.

ACC 704 Research in Accounting Information Systems (3) Course provides an overview of accounting research in accounting information systems topics. Specific research studies are examined as to their theoretical basis, design, implications, methodology, relevance, etc. A-F only. Pre: PhD student status in international management or consent.

ACC 705 Research in Taxation (3) Course provides an overview of accounting research in taxation topics. Specific research studies are examined as to their theoretical basis, design, implications, methodology, relevance, etc. A-F only. Pre: PhD student status in international management or consent.

ACC 799 Directed Reading and Research (V) Reading and research in an area of accounting under the direction of faculty member(s). A-F only. Pre: PhD student status in international management or consent.

Aerospace Studies (AS)

ROTC Programs

The leadership laboratory is required for all courses except AS 304 and 306. Conducted within the framework of organized cadet corps with progression of experiences designed to develop leadership potential. Involves Air Force customs and courtesies, drills, and career progression.

AS 100 Air Force Fitness Course (1) A military fitness program that will challenge all students to meet their maximum fitness levels through a variety of exercises and fitness tests. Open to all students. Repeatable.

AS 101 Foundations of the United States Air Force (1) Study of the total force structure, strategic offensive and defensive, general purpose, and aerospace support forces of the Air Force in the contemporary world. A-F only.

AS 102 Foundations of the United States Air Force (1) Continuation of 101. A-F only.

AS 201 Evolution of USAF Air and Space Power (2) Study of Air Force heritage, Quality Air Force principles, ethics, and an introduction to leadership and group leadership problems. Application of written and verbal communication skills is included. A-F only.

AS 202 Evolution of USAF Air and Space Power (2) Continuation of 201. A-F only.

AS 251L Leadership Laboratory (1) Laboratory course on the basic skills of leadership and followership. Lab includes application of leadership/followership skills, various field trips to military installations, group projects, and

physical training. Repeatable one time. A-F only. Pre: 101, 102, 201, 202 or consent. Fall only.

AS 304 AFROTC Four-Week Field Training

(4) Four-week field experience and training at selected Air Force bases on the Mainland. Required of AFROTC students for Air Force commission. Pre: 101, 102, 201, 202, enrolled in AFROTC program, and consent.

AS 306 AFROTC Six-Week Field Training

(6) Six-week field experience and training at selected Air Force bases on the Mainland. Required of AFROTC students for Air Force commission. Pre: enrolled in AFROTC program and consent.

AS 351 Air Force Leadership Studies (3)

Integrated management course emphasizing the military officer as manager in Air Force milieu, including individual motivational and behavioral processes, leadership, communication and group dynamics. A-F only.

AS 352 Air Force Leadership Studies (3)

Continuation of 351. A-F only.

AS 401 National Security Affairs (3) Study of the national security process, regional studies, advanced leadership, ethics, and Air Force doctrine. Special focus placed on preparation for active duty and current issues affecting professionalism. A-F only. Pre: 352 or consent. Fall only.

AS 402 National Security Affairs (3)

Continuation of 401. A-F only. Pre: 401 or consent.

Agricultural and Resource Economics (AREC)

College of Tropical Agriculture and Human Resources, see also Natural Resources and Environmental Management (NREM)

AREC 210 Applied Calculus for Management, Life Sciences, and Human Resources

(3) Applications of calculus (limits, continuity, derivatives, exponential and logarithmic functions, partials, integrals) to problems in business management, social sciences, and life sciences. The course applies symbolic techniques and quantitative methods in problem solving, utilizes concept of proof as a chain of inferences, and promotes development of reasoning skills and mathematical logic in bridging theory and practice. (Cross-listed as NREM 203) FS

AREC 610 Biosystems Modeling (3)

Introduction to system thinking, procedures for developing system models, characteristics of important agricultural system modes, computer approach to evaluation and optimization of system models. Pre: one of MATH 215, MATH 241, MATH 251A or consent. (Cross-listed as BE 638 and GEOG 636)

AREC 624 Research Methodology (3)

Philosophical setting for scientific inquiry, scientific method and its antecedents, application in agricultural economics research. Original research project required. Pre: 634 and ECON 608, or consent.

AREC 626 Econometrics I (3) Review of probability, estimation, small sample and asymptotic properties. Bivariate and multiple regression and matrix algebra formulation. Regression diagnostics. Introduction to heteroskedasticity, autocorrelation, simultaneity,

dichotomous variables, advanced topics. Pre: NREM 310 or ECON 321, and MATH 241; or consent. (Cross-listed as ECON 628)

AREC 627 Applied Microeconomic Analysis

(3) Economic applications to the agricultural and nonagricultural industries are emphasized. Econometric techniques are used to estimate demand, supply, production and cost functions which are analyzed in terms of economic theory and market information. A-F only. Pre: 626 and ECON 627; or consent. (Cross-listed as NREM 627)

AREC 628 Applied Production Economics

(3) The theoretical foundation of production economics and the theory of the firm are developed. Econometric techniques are used to estimate and explain production and cost functions. Pre: 626 and ECON 627, or consent.

AREC 629 Advanced Production Economics

(3) Economics of resource allocation at consumer, firm, and industry levels. Advanced analytical techniques of analysis: programming, synthesis, statistical analysis. Pre: 634 and ECON 608, or consent.

AREC 631 International Trade in Agricultural Products (3)

(3) Nature of trade in agricultural products; agricultural trade policy issues; role of trade in economic development; multilateral policies, commodity markets, and other current issues in agricultural trade. Pre: 634 and ECON 608, or consent.

AREC 634 Econometrics II (3)

Specification, statistical estimation, inference, and forecasting of economic models. Includes advanced topics for single-equation models, pooled models, qualitative dependent variables, simultaneous systems, distributed lags, and time series. Pre: 626, ECON 628 or consent. (Cross-listed as ECON 629)

AREC 636 Advanced Agricultural Policy

Analysis (3) Agricultural policy objectives, tools, issues. Analytical framework, approaches, and techniques, with empirical application to developed and developing country policies. Pre: 634 and ECON 608, or consent.

AREC 694 Economics of Marine Resources (3)

AREC 700 Thesis Research (V)

AREC 800 Dissertation Research (V)

Agronomy (AGRN)

See College of Tropical Agriculture and Human Resources, Natural Resources and Environmental Management (NREM) or Tropical Plant and Soil Sciences (TPSS)

Agronomy and Soil Science (AGRS)

See College of Tropical Agriculture and Human Resources, Tropical Plant and Soil Sciences (TPSS) or Natural Resources and Environmental Management (NREM)

AH

See Arts and Humanities

American Studies (AMST)

College of Arts and Humanities

Sophomore standing or consent is required for all 300-level courses except as noted.

AMST 110 Introduction to American Studies (3) Introduction to different types of college-level writing through analyses of contemporary American culture and to the main themes and approaches used in American Studies and the humanities. **DH**

AMST 150 America and the World (3) Examines America's role in world history and the influence of world affairs on U.S. culture and society. Focuses on U.S. interdependence with African, European, Native American, Asian, and Polynesian civilizations, from 1492 to present. **FG**

AMST 201 American Experience: Institutions and Movements (3) Interdisciplinary course that examines diversity and changes in American values and institutions—political, economic, legal, and social. **DH**

AMST 202 American Experience: Culture and the Arts (3) Interdisciplinary course that examines diversity and changes in American values and culture—literature, film, visual arts, and architecture. **DH**

AMST 211 Contemporary American Domestic Issues (3) Interdisciplinary exploration of such current American domestic issues topics as politics, economics, civil rights, family life, the justice system, and the environment. **DS**

AMST 212 Contemporary American Global Issues (3) Interdisciplinary exploration of such current global issues as international diplomacy, economic development, national security, demographic change, and the environmental protection. **DS**

AMST 310 Japanese Americans: History, Culture, Lifestyles (3) Explores the experiences of Japanese Americans in Hawai'i and the USA at large: historical and cultural heritage, biographical portraits, changing family ties, ethnic lifeways, gender relations, local identity, and the future of island living. **DH**

AMST 313 African Americans: Issues, Culture, History (3) Traces the history and culture of African Americans and outlines contemporary issues. Topics include: slavery and racism, community formation and resistance, cultural expression, African American diversity, civil rights, gender and class relations. **DH**

AMST 315 U.S. Women's History to 1890s (3) A survey of history of U.S. women and gender relations up to 1890s. Emphasis on women's labor, women's involvement in social movement, development of suffrage movement, women's literary and popular culture. Pre: 201, 201A (or concurrent) or 202, 202A (or concurrent) or WS 151, WS 151A (or concurrent), or consent. (Cross-listed as HIST 360 and WS 310) **DH**

AMST 316 U.S. Women's History Since 1890s (3) A survey of history of U.S. women and gender relations since 1890s. Emphasis on social reform, suffrage and the New Woman, women's wartime labor, gender and the Cold War, second wave feminism, divisions among women. Pre: 201, 201A (or concurrent) or 202,

202A (or concurrent) or WS 151, WS 151A (or concurrent), or consent. (Cross-listed as HIST 361 and WS 311) **DH**

AMST 318 Asian America: Survey (3) History of selected Asian immigrant groups from the 19th century to the present. Topics include: immigration and labor history, Asian American movements, literature and cultural productions, community adaptations and identity formation. Pre: junior standing and one of 201 (or concurrent), 202 (or concurrent), SOC 100 (or concurrent), or SOC 214 (or concurrent); or consent. (Cross-listed as ES 318) **DH**

AMST 319 America, Hawai'i and World War II (3) Examines WWII as a watershed in American and Hawai'i history and culture. Topics include: Pearl Harbor, Japanese American internment, sex and racial tensions, Anti-Semitism and the Holocaust, and the dawn of the Atomic Age.

AMST 320 American Environments: Survey (3) Survey of social, political, and cultural relations in diverse, contemporary American environments, including: island societies, urban centers, suburbs, Indian reservations, farming communities, and national parks. Special emphasis on contemporary environmental issues in Hawai'i. **DS**

AMST 321 The American City (3) Evolution since 17th century; role in contemporary American culture; related problems, perceptions, values. (Cross-listed as HIST 375) **DH**

AMST 343 American Thought and Culture (3) Politics, family, philosophy, technology, etc.; their interrelationship with the total society. Pre-Colonial to end of Reconstruction. Pre: 150 or 201 or 202 or 211 or 212 or HIST 151 or HIST 152 or consent. (Cross-listed as HIST 373) **DH**

AMST 344 American Thought and Culture (3) Continuation of 343: 20th century. Pre: 150 or 201 or 202 or 211 or 212 or HIST 151 or HIST 152 or consent. (Cross-listed as HIST 374) **DH**

AMST 350 Culture and Art in America: Survey (3) Popular attitudes toward arts, travel, fashions, craft and industrial productions, recreation. Past used to explain the present. **DH**

AMST 353 Television in American Life (3) Explores the changing role of television and new media technologies in American society and culture. Special focus on media in Hawai'i. Pre: 201, 202, or consent. **DH**

AMST 365 American Empire (3) Examines the interplay between an "American culture of empire" and the rise of the United States as a superpower. Topics: imperialism and political culture, social movements and international affairs, race, gender and class relations. (Cross-listed as HIST 379) **DH**

AMST 373 Filipino Americans: History, Culture and Politics (3) An introduction to the study of Filipino Americans in the United States and the diaspora. The course pays special attention to labor migration, cultural production and community politics. Pre: junior standing. (Cross-listed as ES 373)

AMST 381 Junior Seminar (3) Materials and methods for the study of American life and thought. For American studies majors and minors only. **DH**

AMST 382 Junior Seminar (3) Continuation of 381. For American studies majors and minors only. **DH**

Junior standing or consent required for all 400-level courses.

AMST 401 Filipino Americans: Research Topics (3) A research seminar on the study of Filipino Americans. Special themes in film/video/media, the performing arts, or literature may be offered. (Cross-listed as ES 443)

AMST 410 Asian American Music Cultures (3) An exploration of how Asian American music making is related to community formation, labor migration, and cultural sensibilities throughout the twentieth century.

AMST 411 Japanese Americans: Research Topics (3) Research and thematic seminar on Japanese American culture, issues, and history. Pre: 310 or consent. **DH**

AMST 413 Regionalism: The South (3) Definition of a Southern identity and its relation to the larger U.S. culture, using literary and polemical works of 19th- and 20th-century. **DH**

AMST 414 The American West (3) Surveys the U.S. colonization of the American West, exploring the region's diverse cultures and the conflicts between them. Topics include: European-Native contact, Western myths, natural resources, race, class, and gender. (Cross-listed as HIST 474C) **DH**

AMST 415 Nonethnic Minorities (3) Survey of nonethnic minority group movements, e.g., the blind, the aged, homosexuals. Common denominators, traditional "mistaken identity," contemporary search for new identity. **DS**

AMST 418 Hawai'i's Multiculturalism (3) A multidisciplinary examination of the dynamics of the Hawaiian Islands' racial and cultural diversity from the perspectives of historical trends, social processes, and contemporary political, social, and economic issues as they impact interracial relations. **DS**

AMST 419 Community, Culture and Change (3) As a complement to AMST 418, the course objective is to learn about Hawai'i's multi-racial and multicultural diversity firsthand through various field study projects. Pre: 418 (or concurrent) or consent. **DS**

AMST 420 American Ideas of Nature (3) The natural world in American thought from Native Americans to modern ecologists. **DH**

AMST 423 History of American Architecture (3) History of American architecture in terms of style, techniques, and symbolic meaning. (Cross-listed as ARCH 473) **DH**

AMST 425 American Environmental History (3) Survey history of the complex relations between American societies and diverse U.S. ecosystems, from European contact and colonization to the present. **DH**

AMST 431 American Labor History (3) Conditions of labor in major phases of American development; response of labor and community to changing work environment. Capitalism, unionism, race, gender, law, etc. Emphasis on 20th century. (Cross-listed as HIST 477) **DH**

AMST 432 Slavery (3) Examines the origins, practices, and historical evolution of slavery from the 18th to the 20th century. Considers diverse forced labor regimes: chattel slavery, plantation

agriculture, convict labor, "wage slavery," and patriarchal domination. (Cross-listed as HIST 473) **DH**

AMST 434 Politics in Hawai'i (3) Discussion of modern politics against the background of recent history and major contemporary issues. **DS**

AMST 435 History of Crime & Punishment (3) History of American crime and punishment from 18th century to the present. Topics: changing crime patterns, evolving punishment methods, penal reform movements, convict resistance, growth of prison industrial complex, racism, class, and gender. **DS**

AMST 436 Gender, Justice and Law (3) Past and present roles of women in American political and legal institutions; common law, judicial decisions, and federal and state legislation affecting women of various socioeconomic groups. A-F only. (Cross-listed as POLS 436 and WS 436) **DS**

AMST 438 Asian Women (3) History, culture, and contemporary reality of Asian women in Asia and the United States. Includes critical analysis of American feminist methodology and theory. Pre: one of 310, 316, 318, 373, 455, POLS 339, WS 360, WS 361, WS 439; or consent. (Cross-listed as POLS 372 and WS 462) **DS**

AMST 440 Race and Racism in America (3) Racial ideas and ideologies, and their effects, throughout American history. **DH**

AMST 442 Radical Traditions (3) Varieties of radicalism that have provided a continuing critique of prevailing values and structures. **DH**

AMST 445 Racism, American Culture and Film/Media (3) An exploration of the critique of racial ideologies in American film. The course also examines how aggrieved communities develop cultural sensibilities, aesthetic choices and politicized identities through film, video and media work.

AMST 451 Popular Culture (3) Major themes, modes, and media of popular or mass culture in the United States; emphasis on cultural trends and social implications. **DH**

AMST 452 The '20s and '30s (3) Novelists, painters, poets, jazz musicians as examples of culture of the 1920s and 1930s in America. **DH**

AMST 453 Culture, Society, and Literature (3) Literary and non-fictional exploration of the intellectual and moral response of Americans to institutions and culture of 20th-century marketplace economy. **DL**

AMST 455 U.S. Women's Literature and Culture (3) Reading of selected works of U.S. women's literature and cultural texts (such as art and film). Emphasis on historical and cultural context and diverse expressions of women's gendered identities. Pre: 202 (or concurrent), ENG 250 (or concurrent), or WS 151 (or concurrent); or consent. (Cross-listed as ENG 455 and WS 445) **DL**

AMST 456 Arts of the United States (3) Emphasis on the 18th and 19th centuries. Pre: 202 or ART 176 or consent. (Cross-listed as ART 472) **DH**

AMST 457 Museum Interpretations (3) Studies the interpretive strategies and methods used by museums to communicate with visitors

in museums, art galleries, historic sites, parks, and related places. Considers how interpretations contribute to cultural knowledge. Repeatable one time. Pre: consent. (Cross-listed as ART 481) **DH**

AMST 458 Film in American Culture (3) Comprehensive survey of varieties of film experience from historical and contemporary points of view. **DL**

AMST 459 Sports in America (3) Sports as reflected in literature, films, and TV. **DS**

AMST 461 America's World Role (3) Examination of America's role in modern world affairs, against the background of history, perceptions, and values. **DS**

AMST 464 America and Africa (3) American attitudes toward Africa, as well as how Africa has functioned within the dynamics of American culture and history. **DH**

AMST 465 American Experience in Asia (3) Comparison of American experiences in Japan, China, and Southeast Asia within historical and perceptual framework. (Cross-listed as ASAN 465) **DH**

AMST 475 Documentation of Historic Architecture (V) Study and documentation of existing buildings, structures, sites of historic and/or cultural significance, including field measurements and drawings, historical research, photo documentation, and preparation of archival drawings to be deposited in the Library of Congress. Documentation conducted according to standards of the Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER). Repeatable. Pre: consent. (Cross-listed as ARCH 472).

AMST 481 Senior Research Seminar (3) Capstone course for American Studies students to undertake a major research project. Pre: consent.

AMST 490 (Alpha) Topics in American Studies (3) Themes, problems, and issues not addressed in other American studies undergraduate courses, focused within these areas: (B) social structure and interaction; (C) thought and belief; (D) arts and environment; (E) historic preservation. Repeatable with consent.

AMST 499 Readings in American Studies (V) Directed readings and research for majors. Pre: consent.

AMST 500 Master's Plan B/C Studies (1)
Graduate standing or consent required for all 600-level courses.

AMST 600 Approaches to American Studies (3) Introductory survey of methodological issues underlying research in American studies.

AMST 601 Patterns of American Cultures (3) American cultural origins and development. Beginnings to civil war.

AMST 602 Patterns of American Cultures (3) American cultural origins and development. Civil war to present.

AMST 611 Asian America (3) The Asian American experience from an interdisciplinary and humanities perspective. Asian American history, literature, media, and theater arts. Comparative study of Hawai'i and the Continental United States.

AMST 612 Women in American Culture (3) Historical/contemporary status of women in the

United States; women's roles as defined by legal, educational, political, economic, and social institutions; implications for social science method. (Cross-listed as WS 612)

AMST 614 Advanced Topics: American West (3) Examination of the U.S. colonization of the American West. Topics include: European-indigenous relations, migration and labor, regional literature, frontier ideology, ethnic conflict, and new community formation. (Cross-listed as HIST 639F)

AMST 615 Performance, Culture, and Theory (3) A survey of major critical works in fields of performing arts and public culture (e.g., dance, theater, music, commemoration). Topics include: theoretical application for the discipline of American studies, and the impact of social movements and labor migration on the performing arts.

AMST 617 Social and Cultural Diversity in America (3) Examination of selected subcultures in America.

AMST 618 American Sexualities (3) Aspects of sexual identity within the context of American culture.

AMST 623 American Architecture (3) Cultural analysis of the evolution of American architecture from the Colonial period to the present involving sociopolitical and economic, as well as aesthetic, considerations. (Cross-listed as ARCH 671)

AMST 624 Wilderness in America (3) American wilderness as both physical setting and social construction. A-F only. Pre: graduate standing or consent.

AMST 625 Material Culture (3) Physical artifacts considered as documents of American cultural and regional development. (Cross-listed as ARCH 625)

AMST 626 Environment and Society (3) Technological development in cultural perspective; its relation to the American environment, science, capitalism, public policy, and values.

AMST 627 The American City (3) Urban life and culture in contemporary and historical perspective; emphasis upon promises and problems of city in American culture. (Cross-listed as ARCH 627 and HIST 639E)

AMST 632 Mass Media (3) Appraisal of major media of communications in American society with attention to political, educational, cultural, and ethical implications.

AMST 635 Public History and Commemoration (3) Approaches to public presentations of history and examination of various ways in which historic memory is constructed in sites such as museums, memorials, and theme parks.

AMST 638 American Punishment (3) Examines the history of American criminal punishment, from the birth of the penitentiary to the rise of the prison-industrial complex. A-F only. (Cross-listed as SOC 638)

AMST 643 Critical Traditions in America (3) Examination of various dissident movements in American history.

AMST 646 Advanced Topics: Social/Cultural/Intellectual (3) Readings and research on American social and intellectual history. Repeatable. (Cross-listed as HIST 639B)

AMST 647 Advanced Topics: Business/Labor/Technology (3) Readings and research on American business, labor, and technological history. Repeatable. (Cross-listed as HIST 639K)

AMST 649 American Intellectual Traditions (3) Examination of intellectual figures and movements in American history.

AMST 656 Film in America (3) Examination of various roles of motion picture film in America with particular respect to art form, cultural artifact, document, and myth.

AMST 659 Arts in America: Modern to Post-Modern (3) Survey of the literature of the field.

AMST 664 America in Asia (3) Topics in U.S. economic, political, military, and cultural relations with East and Southeast Asia, from the 18th century to the present.

AMST 668 Globalization and Transnationalism (3) Examines the socio-economic and cultural meanings of globalization and transnationalism. Emphasis on how the deployment and flows of power beyond the nation-state have an impact on regional, national, and/or local communities and cultures.

AMST 669 Advanced Topics: America and the World (3) Historical and contemporary issues in America's global relationships.

AMST 671 19th Century U.S. Literature (3) Selected works of 19th-century literature as cultural documents.

AMST 672 20th Century U.S. Literature (3) Selected works of 20th-century literature as cultural documents.

AMST 673 African American Literature (3) Cultural and social imagination of blacks and whites as revealed in literature, poetry, and drama.

AMST 674 Harlem Renaissance (3) Politics and literature of culture and race with the focus on Harlem in the 1920s.

AMST 675 Preservation: Theory and Practice (3) History and philosophy of historic preservation movement. Analysis of values and assumptions, methodologies and tactics, implications for society and public policy. (Cross-listed as ARCH 628 and PLAN 675)

AMST 676 Recording Historic Resources (3) Techniques in recording and evaluation of historic buildings and other resources, with an emphasis on field recordings and state and federal registration procedures. (Cross-listed as PLAN 676)

AMST 677 Community Preservation (3) Local-level historic preservation, with an emphasis on historic districts, design guidelines, regulatory controls, and community consensus-building. (Cross-listed as PLAN 677)

AMST 679 Elements of Style (3) The manifestations, visual characteristics, and social/cultural meaning of "style" in American architecture and decorative arts from the early settlement period through the present.

AMST 680 Historic Building Technology (3) History of buildings, building technologies, materials, and finishes, including construction techniques and methods of investigating older buildings. Emphasis on North American building practices c.1600–c.1960.

AMST 681 American Vernacular Traditions (3) Methods and approaches in the study of vernacular architecture, cultural landscapes, and material culture, with an emphasis on traditions and innovations in the Americas. (Cross-listed as ARCH 650)

AMST 683 Museums: Theory, History, Practice (3) History and theory of museums and related institutions (art galleries, historic houses, zoos, parks). Relationship between museums, collections, and communities. Introduction to governance, planning, legal, and ethical concerns.

AMST 684 Museums and Collections (3) Work of museums and professionals (registrars, collections managers, conservators, curators and others) in the care of collections, interpretive studies of museum displays and collections and fieldtrips. Pre: 683 (or concurrent) or consent.

AMST 685 Museums and Communities (3) Public role of museums and their responsibilities, museum education and outreach programs, representation of Native peoples, legal issues, budgets and finances, marketing and public relations. Pre: 683 (or concurrent) or consent.

AMST 686 Museum Studies Practicum (3) Applies coursework in museum studies to hands-on activities under the direction of practicing professionals and university faculty. Museum studies certificate students only. Pre: consent.

AMST 690 Research Seminar (3) Themes, problems, and issues not addressed in other American studies graduate courses; emphasis upon research methods. Repeatable.

AMST 695 Historic Preservation Practicum (3) Applies course work in historic preservation to hands-on activities under the direction of practicing professionals and University faculty. Historic preservation certificate students only.

AMST 696 (Alpha) Preservation Field Study (6) On-site historic preservation field study. Site will rotate. Academic and hands-on preservation training. (B) Hawai'i; (C) Asia; (D) Pacific. Repeatable in each alpha to a maximum of 18 credit hours. Pre: consent.

AMST 699 Directed Reading/Research (V)

AMST 700 Thesis Research (V)

AMST 800 Dissertation Research (V)

Anatomy (ANAT)

School of Medicine

ANAT 499 Directed Reading Research (V)

ANAT 512 (Alpha) Unit II Concurrent Electives (1) Elective courses for first-year medical students. (B) human anatomy of the thorax and upper limb; (C) histology. CR/NC only. Pre: BIOM 551 and consent.

ANAT 513 Unit III Concurrent Electives (Alpha) (1) Elective course for first-year medical students. (B) human anatomy of abdomen and lower limbs; (C) histology. CR/NC only. Pre: BIOM 551 and consent. Spring only.

ANAT 514 (Alpha) Unit IV Concurrent Electives (1) Concurrent electives in anatomy. (B) functional anatomy of the head, neck, and lower limb with review of the upper limb anatomy included; (C) human embryology; systematic study of human development including implantation, placentation, basics of

development of each organ system with reference to pertinent congenital anomalies and their surgical repair; (D) neuroanatomy: spinal cord, brain stem and the regions of the cerebrum will be discussed; (E) human anatomy of the head, neck, and spine. CR/NC only. Pre: BIOM 551 and consent.

ANAT 515 (Alpha) Unit V Concurrent Elective (1) Elective course for second-year medical students. (B) embryology. CR/NC only. Pre: BIOM 551 and consent. Spring only.

ANAT 545 (Alpha) Unit VII Anatomy Electives (V) Advanced study of human anatomy by dissection and individual observation of surgical procedures. (C) topics in reproductive biology. CR/NC only. Pre: FPCH, MED, OBN, PED, PSTY, SURG 531 or 532; or consent.

ANAT 599 Independent Study in Anatomy (1) Elective course for advanced medical students. (B) independent study of human gross anatomy; (C) histology. CR/NC only. Repeatable. Pre: BIOM 551 or consent.

ANAT 601 Histopathology (2) Introduction to normal tissue structure and basic principles of pathological processes. Histological preparations of normal and abnormal tissues will be studied. Pre: consent.

ANAT 603 Lower Extremity, Thorax, and Abdomen (3) Human gross anatomy dissection of the lower extremity, thorax, and abdomen with emphasis on muscles, function, innervation, and vascular supply. A-F only. Repeatable one time. Pre: departmental approval. Spring only.

ANAT 604 Upper Extremity, Head, Neck, and Spine (3) Human gross anatomy dissection of the upper extremity, head, neck, and spine with emphasis on muscles, function, innervation, and vascular supply. A-F only. Repeatable one time. Pre: departmental approval. Fall only.

ANAT 607 Human Embryology (2) Systematic study of human development, including implantation, placentation, basics of development of each organ system with reference to pertinent congenital anomalies and their surgical repair. Pre: consent. Recommended: gross anatomy course.

ANAT 612 Seminar in Anatomy Teaching (1) Effective teaching methods, organization of courses in anatomical sciences, development and evaluation of exams, experience in teaching with audiovisual/computer aids. Open to graduate students in anatomy or reproductive biology. Repeatable. Pre: 601, 603, and 604.

ANAT 699 Directed Research (V)

ANAT 700 Thesis Research (V) Pre: admission to candidacy (master's program).

ANAT 800 Dissertation Research (V)

Animal Sciences (ANSC)

College of Tropical Agriculture and Human Resources

ANSC 200 Humans, Animals, and Agriculture (3) (2 Lec, 1 3-hr Lab) Introduction to animal agriculture, animal science, and the use of animals by humans. Ethics and importance of human use of animals in agriculture are emphasized. **DB**

ANSC 201 Principles and Practices of Animal Science (3) Breeds, their origin, distribution/evaluation; management practices for food, fiber, work, pleasure. Beef, dairy, sheep, swine, poultry, horses, aquatic species emphasized. **DB**

ANSC 240 Contemporary Issues in Food Systems (V) Course covers all food safety issues from farm to processing to handling prior to consumption. Course is taught by faculty with academic expertise (e.g. practical field experience), researchers involved in food safety, individuals providing education and training in food safety, and regulators and producers involved in daily implementations of food safety guidelines. Spring only. (Cross-listed as FSHN 240)

ANSC 244 Comparative Nutrition (3) Digestive systems and nutrient functions, interrelationships and metabolism are compared among animal species, including humans. An intermediate, general nutrition course for Food Science and Human Nutrition and Animal Science majors. Pre: CHEM 161 or consent. Fall only. (Cross-listed as FSHN 244) **DB**

ANSC 301 Anatomy of Agricultural Animals (4) (3 Lec, 1 3-hr Lab) Micro and gross anatomical arrangements of tissues and organ systems of domestic animals. Pre: 200. **DB**

ANSC 321 Applied Animal Nutrition (3) (2 Lec, 1 3-hr Lab) Application of the principles of nutrition to feeding of farm animals; composition and nutritional value of feed stuffs; nutritional requirements of beef cattle, dairy cattle, horses, poultry, and swine. Pre: 244 or FSHN 244. **DB**

ANSC 350 Humans, Food, and Animals: Ethics, Issues, and Controversies (3) (2 Lec, 1 3-hr Lab) Ethical issues and other controversies related to human and animal needs; their impact on resource sustainability and quality of life are explored from scientific perspectives. Pre: 201 or FSHN 181 or FSHN 185. (Cross-listed as FSHN 350) **DB**

ANSC 353 Horses and Horsemanship (3) (2 Lec, 1 3-hr Lab) Origin of species, breeds, nutrition, care, management. Lab on management practices with work on light horses. **DB**

ANSC 360 Topics in Aquaculture Science (3) Survey of specific areas in aquaculture including biological, physical, economic aspects of intensive/extensive crustacean, fish, mollusc, aquatic plant culture; terrestrial system integration. Pre: 200 and 201, or BIOL 171; or consent. **DB**

ANSC 431 Beef Production (3) (2 Lec, 1 3-hr Lab) Principles of economic beef production, including beef breeds, selection, breeding, management systems, feeding, and marketing under tropical conditions. Pre: 201 and 244. **DB**

ANSC 432 Swine Production (3) (2 Lec, 1 3-hr Lab) Principles of efficient pork production, including comparative breed evaluation, breeding, feeding, management, marketing, and business aspects. Problems and practices associated with tropical environment emphasized. Pre: 201 and 244. **DB**

ANSC 433 Tropical Dairying (3) (2 Lec, 1 3-hr Lab) Principles involved in economical milk production in the tropics, including management, recordkeeping, breeds, breeding, selection, culling, feeding, housing, milking,

quality control, and raising young animals. Pre: 201 and 244. **DB**

ANSC 445 Genetics and Animal Breeding (3) Review and application of genetic principles to livestock, poultry, companion, aquatic, and laboratory research animals. Current practices and future developments. Pre: BIOL 171, ZOOL 101, or equivalent; or consent. Recommended: biochemistry and genetics or equivalent. **DB**

ANSC 446 Genes and Animal Biology (3) An understanding of animal biology at the level of genes and their regulations; emphasis on gene structure, recombinant DNA, transgenic animals and functional genomics being used for agricultural, nutritional and biomedical sciences. Repeatable one time. Open to nonmajors. A-F only. Pre: 301, BIOL 171 or ZOOL 101, PEPS 371 or equivalent; or consent.

ANSC 450 Aquaculture Production (3) Theory and practice of aquaculture: reproduction, yield trials, management, economics and business case studies of fish, crustaceans, and molluscs. Field classes held at commercial farm and hatchery. Repeatable. Pre: 200 (or concurrent) and 201 (or concurrent), or BIOL 172 (or concurrent). (Cross-listed as OCN 450) **DB**

ANSC 451 Physiology of Domestic Animals (3) Functions and relationships of organs and organ systems of domestic animals excluding reproduction and lactation. Problem-based learning and case studies are emphasized. Pre: 301 or consent. **DB**

ANSC 453 Animal Diseases and Their Control (3) Disease problems of livestock, poultry, and companion animals; their economic significance, causes, public health implications, and control. Pre: 200 or consent. **DB**

ANSC 454 Meat Science and Muscle Biology (3) Development, growth, function, carcass evaluation of muscle tissue. Pre: 301. **DB**

ANSC 454L Meat Science and Muscle Biology Lab (1) (1 3-hr Lab) Livestock and poultry slaughter, carcass evaluation, meat chemistry, muscle physiology and biochemistry, meat microbiology, and meat processing. Pre: 454 (or concurrent). **DY**

ANSC 460 Biology and Culture of Shrimp and Prawns (2) Aspects of the biology and culture of the freshwater prawn *Macrobrachium rosenbergii* and marine shrimp *Penaeus* (sp) species. Scientific research results and case studies presented and analyzed. Pre: BIOL 171, ZOOL 101, or equivalent; or consent. **DB**

ANSC 462 Reproduction and Artificial Insemination (4) (3 Lec, 1 3-hr Lab) Introductory exploration of anatomy, development, and physiology of reproduction of domestic animals and artificial insemination. Pre: 200 or consent. **DB**

ANSC 465L Aquaculture Production Laboratory (3) Field trips and laboratory study of the life cycles of marine shrimp, freshwater prawns, molluscs and fish. Creating and maintaining spawning and culture systems for aquaculture animals and their food organisms. (Lab hours TBA) Repeatable one time. Pre: 450/OCN 450 or 460 (or concurrent registration in 450/OCN 450) or consent. Must have strong interest in hands-on rearing aquaculture animals and flexible time for live animal care. Co-requisite: ANSC/OCN 450 or 460.

ANSC 472 Endocrinology of Domestic Animals (3) Physiology of secretion and actions of hormones of pituitary, thyroid, adrenal, pancreas, parathyroid, thymus, other endocrine organs excluding reproduction. Pre: 200 or consent. **DB**

ANSC 490 Aquaculture Business Planning and Entrepreneurship (2) Practical aspects of planning and developing an aquaculture business from conceptualization to a final business plan. Topics include species/technology, project planning, business structuring, permitting, contracts, production plans, financial planning and analysis, market/competition analysis, capital acquisition, intellectual property and legal issues. Repeatable one time. Pre: 450/OCN 450 or 460 (or concurrent registration in 450/OCN 450) or consent. Must have strong interest in hands-on rearing aquaculture animals and flexible time for live animal care. Co-requisite: 450/OCN 450 or 460.

ANSC 491 Topics in Animal Sciences (V) Study and discussion of significant topics, problems. Offered by visiting faculty and/or for extension programs. Repeatable.

ANSC 492 Internship (4) Integration and application of academic knowledge and critical skills emphasizing professional development. Placement with an approved cooperating supervisor/employer. A-F only. Pre: consent. (Cross-listed as FSHN 492)

ANSC 499 Directed Study or Research (V) Limited to exceptional undergraduate students, generally with a minimum cumulative GPA of 2.7 or a minimum GPA of 3.0 in major. Exceptions may be granted for students with high achievement in last three semesters.

ANSC 500 Master's Plan B/C Studies (1)

ANSC 603 Experimental Design (4) (3 Lec, 1 3-hr Lab) Design of experiments and variance analyses in biological and agricultural research. Pre: NREM 310 or ZOOL 631. Recommended: ZOOL 632. (Cross-listed as TPSS 603)

ANSC 641 Seminar in Animal Sciences (1) Topics of current interest and current research related to nutrition, genetics, and physiology. Pre: consent.

ANSC 642 Advanced Animal Nutrition (3) An advanced course in the nutrition of monogastric, ruminant, avian, and aquatic species. Topics include digestive system structures, utilization of nutrients, energy metabolism, and experimental techniques used in the study of animal nutrition. Pre: introductory biochemistry or animal nutrition; or consent.

ANSC 643 Physiology of Reproduction (3) Comparative differentiation, development, growth, and function of the reproductive systems of mammals and birds; external factors that influence response; artificial insemination. Pre: 451 or consent.

ANSC 644 Growth Biology of Meat Animals (2) Growth and development of meat-producing animals; skeletal muscle, adipose tissue, and bone; protein turnover, lipid metabolism, and bioenergetics; regulation of animal growth.

ANSC 652 Information Research Skills (1) Examines the use of libraries and information technology for scholarly investigation in support of scientific research; provides experience

utilizing and critically evaluating a variety of print and electronic sources in basic and applied sciences. Pre: consent. (Cross-listed as FSHN 652, NREM 652, and TPSS 652)

ANSC 687 Advanced Laboratory Techniques (3) (1 Lec, 2 3-hr Lab) Advanced laboratory techniques used in food science and human nutrition research. Pre: BIOC 441 and BIOC 441L, or BIOL 402, FSHN 477, MBBE 402 and 402L, PEPS 402, PEPS 402L. (Cross-listed as FSHN 687 and MBBE 687)

ANSC 699 Directed Research (V) Pre: consent.

ANSC 700 Thesis Research (V)

Anthropology (ANTH)

College of Social Sciences

Most 300- and 400-level courses have as a prerequisite one of the 200-level courses. Additionally, 300- and 400-level courses may be taken for graduate credit with prior approval of the student's adviser.

ANTH 151 Emerging Humanity (3) Introduction to the paleontology of human biological evolution and the archaeology of culture in the world prior to AD 1500. **FG**

ANTH 152 Culture and Humanity (3) Introduction to cultural anthropology. How human groups have come to terms with, modified, and even created their physical, social, natural, and supernatural environments, and endowed their lives with meaning and order. Open to non-majors. A-F only. **FG**

ANTH 165 Heritage Sites in Archaeology (V) Combined lecture-lab-fieldwork course to introduce the concepts and practices of archeology, historical research, historic site preservation, and heritage management. Repeatable one time. A-F only. **DS**

ANTH 200 Cultural Anthropology (3) Nature of culture; introduction to basic concepts for analyzing cultural behavior; culture and the individual. Required for anthropology majors. **DS**

ANTH 210 Archaeology (3) Introduction to prehistoric archaeology; methods and techniques of excavation and laboratory analysis; brief survey of theory in relation to change and diversity in prehistoric human groups. **DS**

ANTH 215 Physical Anthropology (3) Human evolution, primatology, human genetics, biological variation, human adaptability, growth and development. Co-requisite: 215L. **DB**

ANTH 215L Physical Anthropology Laboratory (1) Laboratory to accompany 215. Co-requisite: 215. **DY**

ANTH 300 Study of Contemporary Problems (3) Significance of anthropology for contemporary affairs, particularly American ethnic and minority group relations. Relevance to various professions, governmental policy, political action, and accomplishment of change. **DS**

ANTH 303 Technology and Culture (3) Theory of culture and technology; development of technology in context of cultures since the stone ages. The present and future are considered. Pre: one of 200, 210, or consent. **DS**

ANTH 305 History of Anthropology (3) Development of anthropological ideas, focusing on theoretical issues concerning culture, society, and human nature. Required of majors. Pre: 200. **DS**

ANTH 307 Theory in Contemporary Anthropology (3) Theoretical issues that have generated current research and controversies in more than one specialty within social/cultural anthropology; historical roots. Pre: 200 or consent. **DS**

ANTH 308 American Culture (3) Contemporary culture of the United States. Variations in kinship, family, work, play, values, religion; selected topics such as ethnicity, alternate lifestyles, consumerism, addiction. Pre: 200, or consent. **DH**

ANTH 310 Human Origins (3) Theory of evolution, evolutionary systematics, and taxonomy; evolutionary biology of primates; fossil records for primate and human evolution. Laboratory included. Pre: 215, BIOL 103, ZOOL 101, or consent. **DB**

ANTH 313 Visual Anthropology (3) Historical development of documentary films of non-Western peoples; critical examination of ways in which ethnographic films represent different cultures. Pre: 200 (or concurrent), or consent. **DH**

ANTH 315 Sex and Gender (3) Cross-cultural theories and perceptions of sexual differences; linkage between biology and cultural constructions of gender; relationship of gender ideology to women's status. Pre: 200 or consent. (Cross-listed as WS 315) **DS**

ANTH 316 Anthropology of Tourism (3) Anthropological perspectives on the subject of the global phenomenon of tourism. Includes issues of cultural performance, identity, and commoditization. Open to nonmajors. **DS**

ANTH 321 World Archaeology I (3) Archaeology of human origins, early cultures, and origins of agriculture. Pre: 210 or consent. **DH**

ANTH 322 World Archaeology II (3) Archaeology of complex societies, including the rise of urbanism, state-level society, historical and industrial archaeology. Pre: 210 or consent. **DH**

ANTH 323 Pacific Island Archaeology (3) Origins of Pacific peoples; chronology of settlement; sequences of culture in Australia, Melanesia, Micronesia, and Polynesia. Pre: 200 or consent. **DH**

ANTH 330 Social Organization (3) Systematic study of human institutions; general principles of social interaction formulated from ethnographic data. Pre: 200 or consent. **DS**

ANTH 345 Aggression, War, and Peace (3) Biocultural, evolutionary, and cross-cultural perspectives on the conditions, patterns, and processes of violence, war, nonviolence, and peace. Pre: 200 or consent. (Cross-listed as PACE 345) **DS**

ANTH 350 Pacific Island Cultures (3) Introduction to cultures of Polynesia, Micronesia, and Melanesia from time of first settlement to emergence of modern nation states. Pre: 200 or consent. **DH**

ANTH 370 Ethnographic Field Techniques (V) Problems and techniques of social-cultural

anthropological fieldwork; ethnographic literature; work with informants. Pre: 200 or consent. **DS**

ANTH 380 Archaeological Lab Techniques (4) Laboratory analysis and evaluation of field data; preservation and restoration of artifacts. Preparation for publication. Pre: 210 or consent. **DH**

ANTH 381 Archaeological Field Techniques (V) Archaeological survey and excavations; field trips, mapping, photography. May focus on terrestrial or underwater. May be taught entirely in the field at a national or international archaeological site. Repeatable one time with consent. Pre: 210 or consent.

ANTH 384 Skeletal Biology (3) Introduction to the human skeleton and methods for analyzing archaeological human remains including age, sex, ethnicity, paleodemography, skeletal and dental variation, paleopathology, population studies. Co-requisite: 384L. **DB**

ANTH 384L Skeletal Biology Laboratory (1) Laboratory to accompany 384. Co-requisite: 384. **DY**

ANTH 385 (Alpha) Undergraduate Proseminar (3) Selected problems in current research. (B) archaeology; (C) ethnography; (D) social anthropology; (E) applied; (F) psychological; (G) biological. Repeatable. Pre: consent. **DS**

ANTH 399 Directed Reading or Research (V) Pre: minimum cumulative GPA of 2.7, minimum GPA of 3.0 in anthropology, or consent.

ANTH 410 Ethics in Anthropology (3) Seminar surveying ethical cases, problems, issues and questions from the inception of anthropology to the present. Pre: 200 or consent. (Alt. years).

ANTH 413 Language and Gender (3) The role of language in the construction of gender and in the maintenance of the gender order. Field projects explore hypotheses about the interaction of language and gender. No previous knowledge of linguistics required. A-F only. (Cross-listed as LING 415) **DS**

ANTH 414 Introduction to Linguistic Anthropology (3) Introduction to ethnographic study of speech and language. Pre: 200 or consent. (Cross-listed as LING 414) **DS**

ANTH 415 Ecological Anthropology (3) Relationship of humans with natural environment; role of culture in ecological systems. Pre: 200 or consent. **DS**

ANTH 416 Economic Anthropology (3) Analysis of economic activities in non-Western, non-industrial societies; production, distribution, and consumption of goods and services in a variety of cultures. Pre: 200 or consent. **DS**

ANTH 417 Political Anthropology (3) Character of political institutions and their development in non-Western and non-industrial societies. Pre: 200 or consent. **DS**

ANTH 418 The Anthropology of Homosexualities (3) An anthropological examination of homosexualities; consideration of nature/nurture in the origins and expressions of identity and sexuality; social and political aspects of homophobia; queer theory. A-F only. Pre: 200. **DS**

ANTH 419 Indigenous Anthropology (3) An exploration of how anthropology studies

indigenous groups throughout the world. An examination of the changing contexts of anthropological practice as calls for reflexivity lead anthropology of all backgrounds to bring insights from their "homes." Issues include the question of objectivity, the emic-etic distinction, and the ethics of different kinds of anthropological research and the role of anthropologists in indigenous self-determination. Repeatable one time. Pre: 200 or consent. **DS**

ANTH 420 Communication and Culture (3) Anthropological introduction to communication; intercultural and interspecies comparisons; verbal and nonverbal. Ethnography of communication, discourse and structural analyses, ethnomethodology. Pre: 200 or consent. **DS**

ANTH 421 Anthropology and Mass Media (3) Anthropological critique of mass media research; role of mass media in social and cultural processes of authority, economic exchange, and identity formation in Western, nonwestern, and global contexts. A-F only. Pre: 200 or consent. **DS**

ANTH 422 Anthropology of Religion (3) Myth, witchcraft, symbolism, values, ritual, spirit possession, shamanism, religious healing, and millennial cults in primitive, folk, and urban societies. Pre: 200 or consent. (Cross-listed as REL 422) **DH**

ANTH 423 Social and Cultural Change (3) Various approaches to examples of social and cultural change in non-literate societies; evolution, diffusion, acculturation, revolution, etc. Historical features and social processes of colonialism. Pre: 200 or consent. **DH**

ANTH 424 Culture, Identity, and Emotion (3) The interrelation of culture, thought, emotion, and social realities. Role of language and culture in shaping emotional experience and self-understanding, including the formation of social identities such as gender, ethnicity and nationality. Pre: 200, or consent. **DS**

ANTH 425 Medical Anthropology (3) Social and cultural aspects of medicine; the relationship of medicine to the beliefs, social systems, ecological adaptations, and cultural changes of human groups. **DS**

ANTH 427 Food, Health, and Society (3) How human groups identify, collect, create, and transform foods; how they shape those into dietary behaviors, and the influence of those behaviors on health. Pre: 200 (or concurrent), or consent. **DS**

ANTH 428 Body, Biopower and Cyborgs (3) Exploration of critical theories of the body via topics such as genetic adaptation, bodily rituals, gender, race, colonialism, power, tattooing, beautification, medicalization, immigrants, immunology, and cyborgs. An oral intensive course in most years. Pre: 200, 300, 305, 307 or WS 455 (or equivalent); or consent. **DS**

ANTH 430 Human Adaptation to the Sea (3) How people from prehistoric to modern times have sailed, fished, or otherwise exploited and enjoyed the sea; how the sea has molded human life. Pre: upper division standing or consent. **DS**

ANTH 435 Human Adaptation to Forests (3) Cultural ecology of human societies in forest habitats. Emphasis on case studies of traditional and changing adaptations in the tropics. Pre: 200 (or concurrent) or consent. **DS**

ANTH 444 Spiritual Ecology (3) Lectures and seminars provide a cross-cultural survey of the relationships between religions, environment and environmentalism. Pre: 200 or consent. (Cross-listed as REL 444) (Alt. years)

ANTH 445 Sacred Places (3) Lectures and seminars provide a cross-cultural survey of sites which societies recognize as sacred and their cultural, ecological and conservation aspects. Pre: 200 or consent. (Cross-listed as REL 445) (Alt. years)

ANTH 446 Southeast Asian Cultures (3) Cultures of Southeast Asia from hunting and gathering groups to high civilizations; kinship, economic, political, and religious systems; recent developments. Pre: 200 or consent. **DS**

ANTH 447 Polynesian Cultures (3) Analysis of Polynesian cultures from their origins to contemporary states. Pre: 200 or consent. **DS**

ANTH 455 Human Biology of the Pacific (3) Human biology of prehistoric and living populations of the Pacific: mainland and island Southeast Asia, Australia, Melanesia, Micronesia, and Polynesia. Fossil humans, microevolution, human variation, origins. Pre: 215 or consent. **DB**

ANTH 458 Forensic Anthropology (3) Application of physical anthropology to problems in human identification. Determination of age, sex, ancestry, etc., of the skeleton and preparation of reports for legal medicine. Pre: 384 (or concurrent) or consent. **DB**

ANTH 461 Southeast Asian Archaeology (3) Prehistory and protohistory of Southeast Asia and of Southeast Asian contacts with East Asia, India, Australia, and Oceania. Pre: 210 or consent. **DH**

ANTH 462 East Asian Archaeology (3) Prehistory and protohistory of China, Japan, and Korea from earliest human occupation to historic times. Geographical emphasis may vary between China and Japan/Korea. Pre: 210 or consent. **DH**

ANTH 464 Hawaiian Archaeology (3) Archaeological perspective in Hawai'i's past; origins of Hawaiians; early settlement and culture change; settlement patterns and material culture; historic sites preservation. Pre: 210 and consent. **DH**

ANTH 468 Archaeological Theory and Interpretation (3) Introduction to theory in archaeology; interpretive paradigms; the relation of archaeological methods to interpretation and evaluation of theories. Pre: 210. **DH**

ANTH 469 History of Archaeological Thought (3) Historical survey of archaeology as a discipline; focusing on theoretical, methodological, and substantive advances that changed archaeology. Pre: 210 or consent. **DS**

ANTH 472 Ceramic Analysis in Archaeology (3) Concepts, methods, and approaches used in the analysis of ancient pottery. Emphasis placed on ceramic technology, stylistic analysis. Pre: 210 or consent. **DH**

ANTH 473 Lithic Analysis in Archaeology (3) How archaeologists infer procurement, production, distribution, and use of lithic resources, with emphasis on the manufacturing process. Includes lab for replicating prehistoric technologies. Pre: 210 or consent. **DH**

ANTH 474 Geoarchaeology (3) Field and laboratory analysis of sediments and soils in 98 environments, site formation, post-depositional processes, landscape change, and paleogeomorphic reconstruction. Pre: 210 or consent. **DP**

ANTH 475 Faunal Analysis in Archaeology (3) Analysis of archaeologically recovered faunal collections with emphasis on identification and interpretation of nonhuman vertebrate remains. Pre: 210 or consent. **DH**

ANTH 476 Paleobotanical Analysis (3) Paleobotanical analysis is directed toward the understanding of human-plant relationships and their change through time. Theoretical and methodological consideration of pollen, phytoliths, wood charcoal, seeds, and other macro-plant remains in archaeology. Pre: 210 or consent. **DH**

ANTH 480 (Alpha) Anthropological Applications (3) Anthropological theory, method, and data applied to problems in specialized fields. For students in professional fields who lack anthropological background; (B) development; (C) health; (D) education. (480D Cross-listed as EDEF 480) **DS**

ANTH 481 Applied Anthropology (3) Methods and results in application of anthropological concepts to the practical problems of agricultural, commercial, and industrial development. Pre: 200 or consent. **DS**

ANTH 482 Environmental Anthropology (3) This seminar surveys practical environmental questions, cases, problems, and issues from the perspective of applied ecological anthropology. Pre: 415 or consent. (Alt. years)

ANTH 483 Japanese Culture and Behavior (3) Sociocultural factors in Japanese behavior. Social structure; traditional institutions. **DS**

ANTH 484 Japanese Popular Culture (3) This course explores contemporary Japanese popular culture through themes such as gender, consumerism, globalization and nostalgia. Rather than a survey of popular culture genres, the course is organized thematically around issues and problematics. **DS**

ANTH 485 Pre-European Hawai'i (3) Pre-European society and culture from an anthropological viewpoint. Pre: 200 or consent. **DH**

ANTH 486 Peoples of Hawai'i (3) Historic and contemporary society and culture from an anthropological viewpoint. Pre: 200 or consent. (Cross-listed as ES 486) **DS**

ANTH 488 Chinese Culture: Ethnography (3) Critical interpretations of ethnographic and biographic texts depicting individual and family lives in different socioeconomic circumstances, geographical regions, and historical periods of modern China. **DS**

ANTH 489 Chinese Culture: Current (3) Contemporary topics including the modern revolution, ideology, work, popular Confucianism, entrepreneurial activities, emigration, overseas settlements. **DS**

ANTH 495 Senior Thesis (3) Preparation of a major paper with a committee of one chairperson and one other member; paper on topic of interest in anthropology. Optional for majors. Pre: 305 or consent, and senior standing. **DS**

ANTH 496 Senior Thesis (3) Preparation of a major paper with a committee of one chairperson

and one other member; paper on topic of interest in anthropology. Optional for majors. Pre: 305 or consent, and senior standing. **DS**

ANTH 500 Master's Plan B/C Studies (1)

ANTH 601 Ethnology (3) Survey, in historical perspective, of theory in social and cultural anthropology. A course in the graduate core of anthropology. Pre: graduate status and consent.

ANTH 602 Linguistic Anthropology (3) Investigation of mutual influences of linguistic theory and methodology and anthropological theory and methodology. A course in the graduate core of anthropology. Pre: LING 102, graduate status, and consent.

ANTH 603 Archaeology (3) Development of critical and analytical skills in assessment of archaeological literature; emphasis on the science, theory, explanation, and paradigms that comprise archaeology. A course in the graduate core of anthropology. Pre: graduate status and consent.

ANTH 604 Physical Anthropology (3) Human evolution and human variability in extant and previously existing populations; emphasis on history of physical anthropology, evolutionary systematics, primate biology and behavior, paleontology, anthropological genetics, climatic adaptation, growth, and nutrition. A course in the graduate core of anthropology. Pre: graduate status and consent.

ANTH 605 Discursive Practices (3) Emphasizes linguistic, semantic, and interactional aspects of culture, exploring ways that discourse constructs social action and social realities, examining processes by which culture is produced as meaningful behavior in actual situations. Pre: graduate status.

ANTH 606 Anthropology of Infectious Disease (3) The role of human behavior, including its social and cultural determinants, in understanding the distribution of infectious diseases and in shaping preventive and therapeutic strategies. Pre: graduate status or consent.

ANTH 607 The Media and Discursive Practice (3) Role of the mass media in constructing meaning in social cultural processes such as nationalism, ritual, identity, and collective memory. Attention to interactional and poststructural theories of discourse that link the mass media to discursive practice. A-F only.

ANTH 608 History and Memory (3) History and collective memory as culturally formed and politically contested realities. The role of narrative, ritual, and media technologies in shaping representations of the past. Pre: consent.

ANTH 609 Culture and Leadership (3) A multicultural perspective on the theory and practice of leadership examined through cultural, social and institutional factors that produce effective leaders. Specific skills that improve leadership abilities are applied through activities in the course. A-F only.

ANTH 610 Anthropology of Tourism (3) Social and cultural analysis of tourism practices, with emphasis on Hawai'i, Asia and the Pacific. Tourism in relation to consumer culture, transnational flows of people and images, post-colonial politics, performance and identity formation.

ANTH 620 (Alpha) Theory in Social and Cultural Anthropology (3) Major theoretical

problems in (B) kinship; (C) cognitive systems; (D) religion; (E) political institutions; (F) law and social control; (G) economics; (H) ecology; (I) other to be announced. Repeatable. Pre: consent.

ANTH 632 Field Study of Population (3) Concepts and techniques in field study of non-literate (tribal and peasant) populations. For graduate students in the social sciences planning field research that involves taking a census. Pre: consent. (Cross-listed as GEOG 632)

ANTH 640 (Alpha) Methods and Theory in Archaeology (3) Focused seminars pertaining to distinct areas of archaeological method and theory. (B) analytical; (C) environmental; (D) ethnoarchaeology; (E) economic; (F) underwater. Repeatable twice. Pre: 603 or consent.

ANTH 645 Historic Preservation (3) Federal, state, and local laws and regulations that regulate and provide protection to significant archaeological and historical resources in Hawai'i and the region. Pre: 210.

ANTH 650 Women and Culture (3) Cultural diversity and uniformity in the sex-linked role repertoire, interaction, exchange, rituals, symbolization, role reversal, life cycle, socialization, personality, stress, pathology, acculturation, and movement. Pre: classified graduate standing and consent.

ANTH 667 Biomedicine and Culture (6) Combined seminar and field experience/practicum course examining critical medical anthropological perspectives on modern medicine through intensive reading, group discussion, and participant observation in various health service settings. Pre: graduate status or consent or departmental approval. (Alt. years)

ANTH 668 Archaeology Field Methods (6) (5 7-hr Lab) Laboratory and field training in the principles and practice of methods of archaeology—survey, mapping, excavation, conservation. Summer only, full-time. Repeatable. Pre: graduate standing. (Cross-listed as OEST 668)

ANTH 694 Anthro Colloquium Pro-Seminar (1) Entering students in Anthropology graduate program attend and participate in weekly colloquia, which encompasses sub-disciplines and specializations presented in Anthropology at UH Mānoa. Presentations include faculty and other professionals. Graduate student colloquium series will be developed. Repeatable one time. CR/NC only. Pre: graduate standing or consent. Fall only.

ANTH 695 Professional Skills Develop in Anth (3) Seminar prepares graduate students for entry into profession, including employment opportunities, research, presentations, ethics and outreach. Required of all Plan B students. Pre: graduate standing or consent. Fall only.

ANTH 699 Directed Reading or Research (V) Pre: classified graduate standing and consent.

ANTH 700 Thesis Research (V) Research for master's thesis.

ANTH 710 Seminar in Research Methods and Design (3) Theory construction, problem-based research design, proposal writing in anthropology; techniques for collection, processing, analysis and evaluation of data. For students preparing research. Repeatable one time. Pre: classified graduate status in anthropology or consent.

ANTH 712 Data Processing in Anthropology (3) Techniques of data retrieval; strategies of fieldwork and data analysis for identifying, sampling, and processing large bodies of materials. Repeatable. Pre: classified graduate standing and consent.

ANTH 720 Anthropology of Japan (3) Japan examined through three dimensions of cultural anthropology: cultural/symbolic, social/organizational, and individual/psychological. Selected topics analyzed and interpreted in terms of conjunctions of these dimensions. Pre: 483 or 484; or consent.

ANTH 750 (Alpha) Research Seminar (3) Selected problems in current research. (B) archaeology; (C) medical; (D) ethnography; (E) social; (F) psychological; (G) biological. Pre: classified graduate status and consent.

ANTH 800 Dissertation Research (V) Research for doctoral dissertation.

Apparel Product Design and Merchandising (APDM)

College of Tropical Agriculture and Human Resources

APDM 101 Introduction to APDM (3) Introduction to the fields of apparel design and merchandising including theories of fashion change, apparel industry operations, current industry issues, literature of the field, professional competencies, careers in apparel and related businesses. A-F only.

APDM 111 Apparel and Marketing Aesthetics (3) Introduction to design elements, quality features and other factors influencing sensory experiences evoked by fashion-related products. Strategic uses of design in marketing.

APDM 200 Culture, Gender, and Appearance (3) Social construction of gender within culture and its visual expression through appearance. Analysis of role, identity, conformity, and deviance in human appearance. Open to nonmajors. (Cross-listed as WS 200) **DS**

APDM 201 Fashion Promotion (3) Principles and practices in fashion advertising, visual merchandising, publicity and public relations, and fashion show production in apparel and related businesses.

APDM 205 Basic Apparel Construction (4) (3 Lec, 1 3-hr Lab) Principles, concepts, and procedures for quality construction and custom fitting of clothing.

APDM 215 Block Pattern Designing (3) (2 Lec, 1 3-hr Lab) Principles of pattern making for women's apparel through manipulation of pattern blocks. Pre: 205 or consent.

APDM 216 Fashion Illustration I (3) (2 Lec, 1 3-hr Lab) Principles and techniques of sketching the fashion figure including garment details and fabric drape. Development of a personal style of illustration. Introduction to use of computers for illustration. Pre: 111 or consent. **DA**

APDM 221 Textile Fundamentals (4) (3 Lec, 1 3-hr Lab) Physical properties, structures, and finishes of textiles used in apparel and home furnishings. Government and agency requirements affecting textiles. Pre: 101 or consent. **DP**

APDM 237 Pattern Grading (3) Principles of proportionally increasing or decreasing a master

pattern according to a prescribed set of body measurements. Application includes basic, intermediate, and advanced designs. Use of computerized grading program. Pre: 215.

APDM 301 Fashion Forecasting/Marketing (3) Principles and practices in fashion trend forecasting and their role in apparel company marketing strategies. Adapting fashion trend forecasts to apparel lines. Pre: 101, 111, and 221; or consent.

APDM 310 Western World Fashion History (3) Historic study of dress as related to customs and cultures in the Western world, in socio-historical and contemporary contexts. Emphasis on 19th and 20th centuries. Pre: 200, two FG courses; or consent.

APDM 315 Draping (3) (2 Lec, 1 3-hr Lab) Principles of pattern making through draping muslin models on standard garment forms. Pre: 215 or consent.

APDM 316 Advanced Pattern Design (3) (2 Lec, 1 3-hr Lab) Further study of flat pattern methods and industrial practices for fashion design majors. Use of CAD. Pre: 315.

APDM 318 Fashion Illustration II (3) (2 Lec, 1 3-hr Lab) Advanced study in the illustration of the fashion figure. Personal interpretation of the techniques of fashion illustration. Use of CAD. Pre: 216 or life drawing. DA

APDM 330 Advanced Apparel Construction (3) (2 Lec, 1 3-hr Lab) Principles of advanced techniques for garment construction with emphasis on new, difficult-to-handle fabrics. Pre: 205 or consent.

APDM 337 Computerized Pattern Grading (3) (2 Lec, 1 3-hr Lab) Gerber Technology (GT) AccuMark System Management. The system is designed to use CAD for specific apparel industry applications in grading patterns into different sizes and making production markers. Pre: 237 or knowledge and ability to grade patterns; or consent. Computer skills are helpful.

APDM 350 Embellishments (V) Emphasis on design principles as applied to stitchery using a variety of techniques and raw materials. Processes and problems experienced and critiqued in a group environment. Repeatable. Pre: 205 or consent. DA

APDM 370 Interior Design Fundamentals (3) Aesthetic, social, and functional aspects of selection, layout, and furnishing of home interiors; application of principles of design to family living situations. Pre: ART 101 or consent.

APDM 371 Retail Buying and Merchandising (3) Theories and procedures in selecting, buying and selling apparel and textiles. Types of merchandising organizations, analysis of consumer demand, brick-and-click opportunities and challenges, development of an image, operation location, store and floor layout. Pre: 301 and BUS 312; or consent.

APDM 372 Manage Resources-Lead People (4) Uses extant research to define and explore the differences between managing resources in organizations and leading groups/organizations. Explores roles of managers and the use of economic and social capital to achieve organizational goals.

APDM 375 Merchandise Planning and Control (3) Theories, problems, and proce-

dures of financial and assortment planning and control of merchandise inventories. Pre: 371, ACC 201, and MATH 100 (or equivalent), and APDM program math competency test.

APDM 380 Shelter and Society (3) Development and characteristics of traditional shelter and furnishings in relation to culture and customs with focus on Hawai'i, the Pacific Basin, and Asia. Pre: consent.

APDM 401 Clothing and Society (3) Seminar in sociological, psychological, and economic implications of clothing and adornment for the individual and society. Historic and contemporary perspectives. Pre: 301 and consent. DS

APDM 410 Ethnographic Dress (3) Development of ethnic dress as representative of ethnic group status throughout the world. Focus on non-western and Asian ethnic groups. Pre: 200, two FG courses; or consent.

APDM 416 Costumes/Cultures of East Asia (3) Development of traditional dress as visual manifestation of culture. Ethnic and national dress of China, Japan, Korea, Mongolia, Okinawa, Tibet, and Vietnam. Pre: 200, two FG courses; or consent.

APDM 418 Costumes of South and Southeast Asia (3) Development of traditional dress as visual manifestation of culture. Ethnic and national dress of Afghanistan, India, Indonesia, Malaysia, Pakistan, Philippines, Thailand and Saudi Arabia. Pre: 200, two FG courses; or consent.

APDM 419 Apparel Design Studio I (3) Development of independent expression through creative designing for a ready-to-wear collection. Problem solving in the design process; includes sketching, draping, blocking, muslin proofs, complete garments, and portfolio. Studio courses must be taken in sequence. Pre: 221, 301, 310, 316, 330, and either 416 or 418; or consent.

APDM 420 Apparel Design Studio II (V) Continuation of 419.

APDM 430 Fashion Promotion Studio (V) Application of principles and procedures related to the promotion of fashion apparel. Preparation and presentation of fashion information through shows, displays, media, and written communications. Repeatable. Pre: consent.

APDM 437 Brick and Click Retail (3) Application of principles, procedures and techniques of organizing a small retail business in a brick-and-click world. Creative use of low and high tech resources. Students plan, write and evaluate small retail business plans. Pre: 375 and consent.

APDM 460 Costume Collections Management (3) Guidelines and techniques needed for handling textile and apparel artifacts in museums and other collections. Active involvement in documenting, researching, interpreting, and exhibiting costumes and textiles. Repeatable three times. A-F only. Pre: consent.

APDM 471 International Apparel Trade Issues (3) Theories, concepts, problems of international trade of textile and apparel products. Issues of importing and exporting apparel products globally. Social, political and economic factors affecting textile and apparel trade. Pre: 371 or consent.

APDM 491 Topics in APDM (V) Study and discussion of special topics, problems. Offered by staff and visiting faculty. Repeatable.

APDM 492 Internship (4) Integration and application of academic knowledge and critical skills emphasizing professional development. Placement with an approved cooperating supervisor/employer. Pre: senior standing and consent.

APDM 496 Field Study in APDM (V) Study tours to various centers of the world to examine historical and modern apparel and textiles. Merchandising and design methods and operations examined. Repeatable. Pre: consent.

APDM 499 Directed Reading and Research (V) Pre: consent.

APDM 699 Directed Reading and Research (V) Pre: consent and graduate standing.

Arabic (ARAB)

College of Languages, Linguistics and Literature

ARAB 101 Elementary Modern Standard Arabic (4) This course is designed to provide students with basic knowledge of Modern Standard Arabic. The course focuses on developing proficiency in the standard written Arabic language, as well as formal spoken Arabic. HSL

ARAB 102 Elementary Modern Standard Arabic (4) This course focuses on developing proficiency in the standard written Arabic language as well as formal spoken Arabic. It introduces a wide range of situation-based texts and topics that build vocabulary, grammar, and general communicative competence. Pre: 101. HSL

ARAB 201 Intermediate Modern Standard Arabic (4) This course is designed for students who have successfully completed a year of Elementary Arabic. Focus is on acquisition of more complex grammatical structures, expanding vocabulary, and developing competence in a wide range of communicative situations. Pre: 101 and 102, or consent. Fall only. HSL

ARAB 202 Intermediate Modern Standard Arabic (4) This course is designed for students who have successfully completed three semesters of Arabic. Focus is on intensive practice of interactive functional skills such as listening comprehension and fundamental conversation strategies. Pre: 101, 102, and 201. Spring only. HSL

ARAB 301 Third-Level Arabic I (3) To develop proficiency in reading/listening comprehension in Modern Standard Arabic. The instructional materials consist of authentic written, visual and audio materials. Classes meet 3 hours weekly. Pre: 202 or equivalent, or consent.

ARAB 302 Third-Level Arabic II (3) Continuation of third-level Arabic I. Emphasis on developing writing and interaction ability at advanced levels of proficiency. Course includes extensive reading, composition exercises, listening skills, conversation practice and extensive review of Arabic grammar. Developing fluency is the main objective of this course. Classes meet 3 hours weekly. Pre: 301 or equivalent, or consent.

Architecture (ARCH)

School of Architecture

All courses except 100, 241, 251, 261, 271, and 272 are restricted to declared architecture majors, unless otherwise specified. Exceptions must have prior approval of the associate dean or dean.

ARCH 100 Introduction to the Built Environment (3) Broad exploration of creative human responses to place, climate, culture, communication, technology, and time. A study of the human-environment relationship with emphasis on the impact of scientific knowledge and architectural design theory on history, culture, sociology, technology and the built form. **DS**

ARCH 101 Basic Architecture Studio A (4) Perception, design and communication. Exploration of human perception, including multi-sensory reception, interpretation of sensory input by the brain, and emotional and cultural factors. Elements and principles of basic two and three-dimensional design concepts. Formal/spatial exercises that explore elements, surfaces, measure and order in both graphic and architectonic contexts. Analytical exercises which examine both existing and self-created orders and studio activities involving thinking, reading, writing, drafting, model making, and especially drawing (freehand, with instruments and computer). A-F only. Pre: consent. **DA**

ARCH 102 Basic Architecture Studio B (4) Materials, design and communication. Hands-on exploration of various materials and construction techniques and an introduction to various design processes as systematic approaches to solving architectural/environmental design problems. Analysis of architecture as the creation of spaces generated by human needs and aspirations and developing concepts to explore and achieve innovative solutions responding to these needs. Studio activities involving thinking, reading, writing, model making and a variety of communication techniques, with emphasis on the delineation of 3-D spaces using perspective drawing techniques, light notation and computer modeling. A-F only. Pre: 100 and 101, or consent. **DA**

ARCH 103 Basic Architecture Studio A & B (8) Daily studio combined 101 and 102. Perception, design and communication and materials design and communication. See 101 and 102 for full descriptions. A-F only. Pre: 218 (or concurrent), 235+L (or concurrent), ART 113, ENG 100, HIST 151, HIST 152, MATH 140, and PHYS 151.

ARCH 200 Professional Practice of Architecture (3) Introduction to the professional practice of architecture with emphasis on the Asia/Pacific context. Explorations of architects' responsibilities and privileges, how, and with whom they collaborate to accomplish their work. Introduction of professional ethics, attitude, and communication skills; practice formation and organization; and the project delivery process. Exposure to design and practice management, planning and engineering innovations, information and construction technology advancements, and related built environment issues. Includes presentation by practitioners and project case studies. A-F only. Co-requisite: 201

(for architecture majors). Pre: 100 and 201 (or concurrent for architecture majors); or consent.

ARCH 201 Intermediate Architecture Studio A (4) Emphasis on space planning and introduction to building materials and technology and statutory requirements (building codes, life safety issues, etc.). Problems dealing with fairly complex functional requirements, multi-story design issues, vertical transportation, interior finishes, etc.. Production of schematic designs and introduction to design development. A-F only. Co-requisite: 200. Pre: 102, 200 (or concurrent), 235, 235L, and ART elective; or consent. **DA**

ARCH 202 Intermediate Architecture Studio B (4) Architecture design with emphasis on site development and analysis and response to climate and other environmental factors. Site analysis techniques; introduction to passive systems, sustainability and statutory requirements (zoning, land use ordinances, etc.); description and delineation of property and land features; understanding of neighborhoods, regions, community based issues, etc. A-F only. Co-requisite: 218. Pre: 200, 201, 218 (or concurrent), and PHYS 151; or consent. **DA**

ARCH 203 Intermediate Architecture Studio A & B (8) Daily studio combined 201 and 202. Emphasis on space planning and introduction to building materials, technology and statutory requirements, site development, analysis, response to climate and other environmental factors. See 201 and 202 for full descriptions. A-F only. Pre: 101, 102, 235+L (or concurrent) and 218 (or concurrent).

ARCH 213 Lighting, Illumination, and Power (3) Theory of lighting and lighting design. Artificial light sources as positive design elements. Electrical theory; solar and acoustical considerations. Power sources and equipment; integration into design process. Pre: 201 and PHYS 152. **DP**

ARCH 218 Introduction to Architecture Systems (3) Introduction to the basic systems that affect architectural design, including structural, environmental, life-safety, building envelope, building materials and assemblies. Develop the fundamental skills of teamwork to collaborate with others, and design, with the ability to assess, select and integrate these systems into building design. A-F only. Co-requisite: CHEM 151. Pre: MATH 140, PHYS 151, and CHEM 151 (or concurrent); or consent. **DP**

ARCH 235 Computer Applications in Architecture (2) Fundamentals of computers; general and potential use in architecture. Programming to solve everyday practical problems in planning/design of buildings. Open to nonmajors if space available. Pre: MATH 140. Co-requisite: ARCH 235L. **DA**

ARCH 235L Computer Applications Laboratory (1) Direct use of computers toward applications in architecture. Pre: MATH 140. Co-requisite: ARCH 235. **DA**

ARCH 241 Introduction to Urban Design (3) Principles and practice of urban design within the comprehensive planning process. Sociocultural, economic, political, environmental determinants of urban form and pattern. Open to nonmajors if space available. **DS**

ARCH 251 Introduction to Landscape Architecture (3) Principles and practice of

landscape planning, design, and technology. Ecological, sociocultural, and natural science determinants of landscape form and pattern. Open to nonmajors if space available.

ARCH 261 Introduction to Interior Architecture (3) Introduction and orientation to the field. Fundamental design principles and elements as applied to interiors. Basic materials and methods of interior construction; basic professional and business practices. Critical analysis of an existing interior space. Open to nonmajors if space available. **DA**

ARCH 271 World Architecture and Urbanism A (3) The significance of architecture in recording the development and aspirations of societies in the world's major cultural regions, from early agricultural settlements to 1500 C.E. Prerequisite for advanced courses in architectural history and theory. Open to non-majors. **DH**

ARCH 272 World Architecture and Urbanism B (3) The significance of architecture in recording the development and aspirations of societies in the world's major cultural regions, from the 15th century C.E. until the contemporary period. Prerequisite for advanced courses in architectural history and theory. Open to non-majors. **DH**

ARCH 301 Advanced Architecture Studio (4) Design of complex buildings on simple sites and simple buildings on complex sites. Research of specific building types; introduction to building systems and technology. Production of schematic drawings and partial design development documents. A-F only. Pre: 202, 218, CHEM 151, and PHYS 151; or consent. **DA**

ARCH 302 Asia-Pacific Architecture Studio (4) Design of complex buildings on complex sites. Investigation of complex programmatic requirements, building systems and technology. Production of schematic drawings and partial design development documents. A-F only. Pre: 271, 272, 301, 315, 316 (or concurrent), 317, and 318 (or concurrent); or consent. Co-requisite: 316 and 318. **DA**

ARCH 315 Lighting, Power, Acoustical Systems (3) Qualitative and quantitative issues of natural and artificial lighting, natural and manufactured power, and natural and reinforced acoustical systems, and the desirable and appropriate applications to building design. A-F only. Pre: 218 or consent. **DP**

ARCH 316 HVAC and Mechanical Systems (3) Qualitative and quantitative issues of mechanical systems, including heating, natural ventilation, air conditioning, hydraulics, vertical transportation, security and fire protection systems, and the desirable and appropriate applications to building design. A-F only. Pre: 218 or consent. **DP**

ARCH 317 Structure/Material Systems A - Wood (3) Properties, evolution and range of wood and its use in structural systems and the ability to assess, select design, and integrate wood structural systems into building design. A-F only. Pre: 218 or consent. **DP**

ARCH 318 Structure/Material Systems B - Steel (3) Properties, evolution and range of steel and its use in structural systems and the ability to assess, select design, and integrate steel structural systems into building design. A-F only. Pre: 317 or consent. **DP**

ARCH 320 Introduction to Architectural Systems (3) Introduction to the basic systems

that affect architectural design, including structural, environmental, life-safety, building envelope, building materials and assemblies. Students develop the fundamental skills of integrated architectural design, teamwork, and the ability to investigate, assess, and analyze environmental conditions, structural/building systems with the focused purpose of appropriate architectural applications. Architectural majors only. A-F only. Pre: 202, CHEM 151, ENG 100, Math 140 and PHYS 151; or departmental approval. Co-requisite: 301.

ARCH 341 Introduction to Planning (3) Perspectives on planning; planning tools and methods; specific Hawai'i planning/research problems from a multidisciplinary approach. Pre: consent. (Cross-listed as PLAN 310)

ARCH 369 Study Abroad: Architectural Study Tour (V) Firsthand examination of the architecture of various countries, with emphasis on experiencing and comprehending significant spaces within historical, cultural, and physical contexts. Topics and countries visited change with each offering. Open to nonmajors. Repeatable.

ARCH 372 Special Topics in Architectural History and Theory (3) An examination of specific theories, movements, or periods of architectural history. Changing topics to be taught by both regular and visiting faculty. Repeatable. Pre: 271 and 272; and consent. **DH**

ARCH 390 Special Topics (V) Selected topics in any aspect of architecture. Content to be announced. Repeatable. Pre: consent.

ARCH 399 Directed Work (V) Pre: consent.

ARCH 400 Project Management (3) Exploration of the management of architectural services from project initiation through project completion. Investigation of project delivery options; management of project design teams, project operations and services; design parameter definition; design service documentation; and project execution. A-F only. Pre: 200 or consent.

ARCH 401 Asia-Pacific Urban Design Studio (5) Variety of changing topics each semester depending upon faculty's and students' research interests, with exploration of different design issues at the urban scale within the Asia-Pacific region. A-F only. Pre: 302 and 474; or consent.

ARCH 405 Selected Design Studio (V) Special architecture/interior architecture problems individually selected by students or faculty to sharpen design skills. Repeatable. Pre: consent.

ARCH 406 Office Research Practicum (3) Learn design research method[s]. Conduct architectural design research under the guidance of a practicing architect in an office setting in an area of the architect's expertise and interest. The experience also exposes students to the professional practice of architecture via shadowing an architect mentor relative to typical design process activities, communication techniques, and professional ethics issues. A-F only. Pre: 200, 301 or 302; or consent.

ARCH 417 Structure/Material Systems C - Concrete (3) Properties, evolution and range of concrete and masonry and its use in structural systems and the ability to assess, select, design, and integrate concrete and masonry structural systems into building design. A-F only. Pre: 318 or consent. **DP**

ARCH 418 Non-Structural Materials (3) Properties, evolution and range of materials used for non-structural purposes and their applications in building design. A-F only. Pre: 218 or consent. **DP**

ARCH 431 Computer-Aided Design (2) Design theory applications to computer graphics systems and current developments in practice and research. Pre: 202, 235, and 235L. Co-requisite: 431L. **DA**

ARCH 431L Computer-Aided Design Laboratory (1) Use of computer graphics systems in architectural design applications. Pre: 202, 235, and 235L. Co-requisite: 431. **DA**

ARCH 432 Construction Management (3) Design professional's role during the building procurement process, particular emphasis on documentation and construction phases. Analysis of value of professional construction management services. Pre: 202.

ARCH 433 Professional Practice Law and Ethics (3) Exploration of the practice of architecture including: professionalism; office organization and administration; public, client, consultant, and other contractor relations; project administration, procedure and compensation; construction law and contract administration. A-F only. Pre: 400 and 503 (or concurrent).

ARCH 435 Architectural Economics (3) Survey of fundamental business principles and economic theories as they relate to professional practice for design professionals. Pre: 202. **DS**

ARCH 436 Dean's Seminar (V) Lecture/seminar on professionalism, ethics, design, technology, building performance. Transition from academia to professional practice. Pre: consent.

ARCH 472 Documentation of Historic Architecture (V) Study and documentation of existing buildings, structures, and sites of historic and/or cultural significance, including field measurements and drawings, historical research, photo documentation, and preparation of archival drawings to be deposited in the Library of Congress. Documentation conducted according to standards of the Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER). Repeatable. Pre: consent. (Cross-listed as AMST 475)

ARCH 473 History of American Architecture (3) History of American architecture in terms of style, techniques, and symbolic meaning. (Cross-listed as AMST 423) **DH**

ARCH 474 Theories of Architecture and Urban Design (3) An overview of major theories of architecture and urban design, covering important individuals and movements, and examining their impact on contemporary architectural practice and on life in a broad range of local, national, Asia-Pacific and international settings. Pre-requisite for advanced electives in architectural history and theory. Open to non-majors and writing intensive. Pre: 272 or consent.

ARCH 477 Research Seminar (V) Research methodology for the qualitative development of an optimum environment. Repeatable. Pre: consent.

ARCH 500 Master's Plan B/C Studies (1) Enrollment for degree completion. Pre: 702, master's Plan B candidate, and consent.

ARCH 502 Comprehensive Architecture Studio A (5) Assemble comprehensive architectural program including user needs, appropriate precedents, space and equipment requirements, site analysis, laws and standards, site selection, and design assessment criteria. Produce an architectural schematic design informed by the program and other design determinants with statement of probable cost of construction. A-F only. Co-requisite: 315, 316, and 417. Pre: 315 (or concurrent), 316 (or concurrent), 401, and 417 (or concurrent); or consent.

ARCH 503 Comprehensive Architecture Studio B (5) Continuation of architectural design project in ARCH 502. Produce detailed design development of programmatic spaces, structural and environmental systems, life safety provisions, wall sections and building assemblies. Assess completed project with respect to program criteria. Make technically precise descriptions and documentation for review and construction purposes. A-F only. Pre: 502 or consent.

ARCH 504 Practicum Studio A (12) Scholarly pursuit integrated with architecture firm based practical experience under the direction of practicum faculty who is a licensed architect. Investigation of basic project definition proficiencies including office management, project management, programming, site and environmental analysis, schematic design, engineering systems coordination, building cost analysis, and code research. Application of skills based on proficiency areas will include weekly assignments, completion and compilation of professional training and scholarly endeavors, and semester long research projects. CR/NC only. Pre: 433 and 503; or consent.

ARCH 505 Practicum Studio B (12) Scholarly pursuit integrated with architecture firm based practical experience under the direction of practicum faculty who is a licensed architect. Investigation of basic project execution proficiencies including office management, project management, programming, design development, construction documents, specifications and materials research, document checking and coordination, construction procurement, and construction contract administration. Application of skills based on proficiency areas will include weekly assignments, completion and compilation of professional training and scholarly endeavors, and semester long research projects. CR/NC only. Pre: 433 and 503; or consent.

ARCH 506 Asia-Pacific Topical Architecture Studio B (5) Studio based research and design related to a professional project in architectural design, architectural technology, historic preservation, urban design, or other topics that consults and benefits a specific identified community in the Asia-Pacific region. A-F only. Pre: 504, 505, and 573; or consent.

ARCH 507 Architecture Doctorate Studio A (6) Development of an individual Arch.D. project proposal with an approved advising committee and under the guidance of the faculty coordinator of several committees. This studio encourages interaction between returning practicum students and previously licensed candidates through shared proposal development and research techniques. Pre: 505, 506, and 534; or consent.

ARCH 508 Architecture Doctorate Studio B (6) Development of an individual Arch.D. project proposal with an approved advising committee and under the guidance of the faculty coordinator of several committees. This studio encourages interacting between all graduating candidates through shared research techniques and project development. Co-requisite: 507.

ARCH 534 Forms and Frames of Practice (3) Comprehensive study of architectural practice as it relates to the varying roles which architects assume in response to societal demands. A look at the changing role of the architect. Architecture as it relates to form and integration within the frame of the global context. A study of diverse architecture practices, especially in the Asia Pacific region. Exploration of creative challenges including the application of information technology systems, materials and design process research, construction technology, computer-aided manufacturing, and entrepreneurial approaches in contemporary practice. A-F only. Pre: 433, 504 and 505; or consent.

ARCH 535 Architecture Doctorate Seminar (3) Assessment of both contemporary and future architectural education, research and practice, by examining existing and evolving consistencies and shared visions that cut across distinct architectural approaches and other disciplines. Conceptual skills in the production of architecture that links environmental concerns with advances in building construction, computational and informational technologies. It includes the study of collaboration in design and on the technologies and spaces that support it; the study of encoding design knowledge in material resolution. Pre: 474 or consent.

ARCH 573 Asia-Pacific Architecture and Culture (3) To provide both theoretical and historical basis for the built environment of the Asia-Pacific region. A-F only. 271 and 272 and undergraduate language core; or consent.

ARCH 600 Research Methods Seminar (3) Comprehensive review and assessment of objectives, role, and function of research in architecture. Lecture, seminar, and independent study.

ARCH 625 Material Culture (3) Physical artifacts considered as documents of American cultural and regional development. (Cross-listed as AMST 625)

ARCH 627 The American City (3) Urban life and culture in contemporary and historical perspective; emphasis upon promises and problems of city in American culture. (Cross-listed as AMST 627 and HIST 639E)

ARCH 628 Preservation: Theory and Practice (3) History and philosophy of historic preservation movement. Analysis of values and assumptions, methodologies and tactics, implications for society and public policy. (Cross-listed as AMST 675 and PLAN 675)

ARCH 640 Urban Form (3) City spatial organization; principles of neighborhood, town, and city design and planning; spatial dimension of building and land use. Pre: PLAN 640 or consent. (Cross-listed as PLAN 646)

ARCH 641 Land Use Planning (3) Theory and practice; selected modes of land use analysis; growth management strategies. Pre: PLAN 600 and PLAN 601, or consent. (Cross-listed as PLAN 645)

ARCH 642 Urban Design Studio (6) Group experience in defining urban and regional design problems and potentials in developing and evaluating alternative schemes and formulating strategies for implementation of planning and design solutions. Pre: 641 or consent.

ARCH 650 American Vernacular Traditions (3) Methods and approaches in the study of vernacular architecture, cultural landscapes and material culture, with an emphasis on traditions and innovations in the Americas. (Cross-listed as AMST 681)

ARCH 671 American Architecture (3) Cultural analysis of the evolution of American architecture from the Colonial period to the present involving socio-political and economic as well as aesthetic considerations. (Cross-listed as AMST 623)

ARCH 672 Research Studio (5) Activity devoted to specialized focus of student in architectural technology. Emphasis in basic or applied research. Repeatable.

ARCH 675 Professional Ethics (3) Philosophical and analytical study of professional ethics. Lecture and seminar.

ARCH 680 Community Development (3) Social, physical, ecological, and economic problems of communities in the Pacific Basin; examination of solutions emphasizing the application of community organization and services, environmental management, and appropriate technology to communities. Co-requisite: 680L. (Cross-listed as PLAN 685)

ARCH 680L Community Development Design Lab (2) Application of social, physical, ecological, and economic data to selected studio problems in the design of communities. Pre: 302 or 362, and consent. Co-requisite: 680.

ARCH 681 Housing Delivery (3) Application of ecology, appropriate technology, and local resources to problems of housing development in Pacific Basin countries; building design and implementation strategies for housing delivery. Co-requisite: 681L. (Cross-listed as PLAN 686)

ARCH 681L Housing Delivery Lab (2) Application of ecology, appropriate technology, and local resources to selected studio problems in the design of housing. Pre: 302 and consent. Co-requisite: 681.

ARCH 683 Housing and Community Development Practicum (V) Laboratory and field testing of selected topics related to housing design and technology; site development and infrastructure; social, health, and economic community development; and housing implementation strategies. Repeatable. Pre: 680 (or concurrent), 681 (or concurrent), or consent. (Cross-listed as PLAN 683)

ARCH 687 Urban Design in Asia and Pacific (3) Social behavior in urban space; design for individual, society and state functions; urban designing ideas and concepts in the European/American tradition and the variant Asia Pacific traditions. Pre: 341, ASAN 312, PLAN 310 or PLAN 600. (Cross-listed as PLAN 636 and ASAN 636)

ARCH 690 Special Topics Seminar (3) Seminar on a wide range of architectural topics to be directed by both visiting and regular faculty. Repeatable. Pre: consent.

ARCH 691 Special Topics: Architecture History/Theory (V) Specialized work at an advanced level on the history and theory of architecture. Repeatable. Pre: consent.

ARCH 692 Special Topics in Architectural Technology (V) Specialized investigation at an advanced level of technological developments in structural systems, environmental control systems, or materials and methods of construction. Repeatable. Pre: consent.

ARCH 693 Special Topics in Architecture and Design (V) Intensive work on specialized topics in the fields of architecture and design. May include research and/or studio experiences in architecture, interior architecture, computer-aided design, professional practice, advanced visual design, and architectural graphics. Repeatable. Pre: consent.

ARCH 699 Directed Work (V)

ARCH 700 Thesis Research (V) Pre: completion of graduate requirements or consent.

ARCH 701 Graduate Studio I (6) Planning, programming, and schematic design of a project selected by student as the focus of graduate study with emphasis on the thorough performance of all required tasks. Pre: one of 401 or 600, and consent.

ARCH 702 Graduate Studio II (6) Design development of a project selected by student as the focus of graduate study with emphasis on the thorough performance of all required tasks. Pre: 701 with a grade of B or better, or consent.

ARCH 703 Urban Design and Planning Studio (6) Group experience in defining urban and regional design problems and potentials, developing and evaluating alternatives, formulating strategies for implementation. Pre: 641, PLAN 640, or consent. (Cross-listed as PLAN 754)

AREC

See Agricultural and Resource Economics

Art and Art History (ART)

College of Arts and Humanities

It is recommended that art majors complete 113, 115, and 116 of the art required courses prior to undertaking studio courses at the 200 level. Courses labeled repeatable may be taken for a maximum of 6 credit hours unless a second repetition is noted.

ART CORE COURSES

ART 101 Introduction to the Visual Arts (3) Nature of the world's visual arts and their influences on quality of life. Lectures, demonstrations. (Not for art majors) **DA**

ART 113 Introduction to Drawing (3) Descriptive, expressive, and formal aspects of visual language through drawing practice. **DA**

ART 115 Introduction to Two-Dimensional Composition (3) Basic design concepts, elements, and principles of art. **DA**

ART 116 Introduction to Three-Dimensional Composition (3) Basic concepts, elements, and principles of art. **DA**

ART 201 Expanded Arts (3) Theory and practice course investigating language common to all arts activity particularly as related to the contemporary arts. Pre: any two of 113, 115, 116; or consent. **DA**

EXPANDED ARTS/CONTEMPORARY ISSUES

ART 301 (Alpha) Art and Technology Studio I (3) (6 Lec/Lab) Combined theory and practice studio course(s) that investigate language, processes, and personalized composing systems related to the use of technological media and its application to a variety of contemporary art areas and related disciplines. (B) imaging systems; (C) electronic and electro-acoustic sound; (D) interactive systems and installations. Pre: 201 and one 200-level studio; or consent. **DA**

ART 302 Theory and Criticism of Art (3) Examination of the significant themes and issues in contemporary theory and criticism as they relate to the production and reception of art. Pre: 201 or consent. **DA**

ART 389 Hawaiian Art: Studio (3) A studio art course that explores art-making from a Hawaiian perspective, focusing on the concepts of 'Oli and Mo'olelo (narratives) and Kumulipo (creation mythology). Pre: one 200-level studio art course, or consent. **DA**

ART 401 Art and Technology Studio II (3) Tutorial studio course that encourages exploration in combined and new media through independent work within an environment of theoretical and critical discourse. Repeatable once. Pre: 301 or consent. **DA**

ART 403 Contemporary Issues (3) Art studio addressing a specific sociocultural theme. Repeatable twice. Pre: 201 or consent. **DA**

ART 404 Gender Issues in Multimedia and Video (3) Studio/lecture course investigating social, cultural, and gendered representations as informed by contemporary theory and practice. Pre: 201 or any WS course; or consent. (Cross-listed as WS 484) **DA**

ART 405 Professional Practice (3) Methods and skills for professional preparation. Creation of visual/written documentation of artwork and practice. Exploration of legal, financial and ethical considerations of artmaking. Student must have a 35 mm camera and light meter. A-F only. Pre: BFA Art major and advanced standing in Art; or consent.

ART 490 Comparative Aspects of Arts (3) A seminar to compare modalities of form. Methodology: experiential, descriptive, semantic, structural, and historical. Pre: 175 and 176; or consent. **DA**

ART 690 Interdisciplinary Seminar (3) Issues of contemporary art. Analysis of current literature and criticism. Pre: consent.

HISTORY OF ART

ART 175 Survey of Global Art I (3) Art produced in Asia, Africa, Native America, Europe, and the Pacific Islands, from prehistory to the 15th century. Religious and philosophical ideas expressed in architecture, painting, prints, sculpture, applied art, body art, and textiles. Fall only. **FG**

ART 176 Survey of Global Art II (3) Art produced in Asia, Africa, Native America, Europe, and the Pacific Islands, from the 15th century to the present. Religious and philo-

sophical ideas expressed in architecture, painting, prints, sculpture, applied art, body art, and textiles. Spring only. **FG**

ART 275 Women in Art (3) An interdisciplinary survey of the role of women as subject/object in the visual arts, their activity as creators of art and as participants in the art world. Pre: 101 and one of PHIL 100, SOC 100, or WS 151; or consent. (Cross-listed as WS 275) **DH**

ART 370 Ancient Art (3) Arts of Egypt, Mesopotamia, Crete, and Mycenae. Pre: 175 or consent. **DH**

ART 371 Medieval Art (3) Arts of Europe from early Christian era to Renaissance. Pre: 175 or consent. **DH**

ART 373 Art of Greece and Rome (3) Minoan and Mycenaean arts; Greece and Rome. Pre: 175 or consent. **DH**

ART 374 Art of the 19th Century (3) Architecture, sculpture, and painting of Europe. Pre: 176 or consent. **DH**

ART 380 Early Art of Japan (3) Major developments, prehistoric through Kamakura; architecture, painting, sculpture. Pre: 175 or consent. **DH**

ART 381 Later Art of Japan (3) Major developments, Muromachi to modern period; painting, sculpture, architecture. Pre: 176 or consent. **DH**

ART 384 Art of Korea (3) Ceramics, sculpture, painting, and architecture; neolithic through Yi periods. Pre: 175 or 176; or consent. **DH**

ART 385 Art and Culture of Early China (3) A culturally oriented study of Chinese visual arts; emphasis on jade, bronze, secular and religious sculptures, and paintings from prehistory to the 9th century. Pre: 175 or consent. **DH**

ART 386 Art and Culture of Late China (3) A culturally oriented study of Chinese visual arts; emphasis on the rise of literati painting and theory individualism in art and theory, garden, and architecture, and the Chinese pursuit of modernity and post-modernity in art. Pre: 176 or consent. **DH**

ART 390 Art of Africa, Pacific, North America (3) Contextual study of art from selected areas in Africa, the Pacific, and North America. Pre: 175 and 176. **DH**

ART 396 (Alpha) History of Photography (3) History of photography from its beginnings to the present; emphasis on the evolution of photography as an art form; (B) nineteenth century, from the invention of photography through pictorialism; (C) twentieth century, from World War I to the present. Pre: 176 or consent. **DH**

ART 470 (Alpha) Renaissance Art (3) Painting, sculpture, and architecture: (B) early Renaissance in Italy; (C) northern Europe; (D) High Renaissance and mannerism in Italy. Pre: 176 or consent. **DH**

ART 471 Baroque and Rococo Art (3) Architecture, sculpture, and painting of Europe in the Baroque and Rococo periods. Pre: 176 or consent. **DH**

ART 472 Art of the United States (3) Emphasis on the 18th and 19th centuries. Pre: 176 or AMST 202 or consent. (Cross-listed as AMST 456) **DH**

ART 473 Art of the First Half of 20th Century (3) Development of modern art in Europe 1900–1939. Pre: 176 or consent. **DH**

ART 474 Art Since Middle 20th Century (3) Art of Europe and the United States since 1945. Pre: 176 or consent. **DH**

ART 475 (Alpha) Art of the Pacific (3) Visual form and function of the arts in cultural context: (B) Australia, Indonesia; (C) Melanesia, Micronesia, Polynesia; (D) North Pacific coast Indian, Eskimo. Pre: 176 or consent. **DH**

ART 476 Art of Tribal Africa (3) Visual form and function of arts in cultural context. Mali, Burkina Faso, Ivory Coast, Liberia, Guinea, Nigeria, Ghana, Cameroon, Congo, Zaire. Pre: 176 or consent. **DH**

ART 479 Art of Hawai'i (3) Stylistic and aesthetic characteristics of art of ancient Hawai'i; relationship to art from other parts of Polynesia. Pre: 176 or consent. **DH**

ART 481 Museum Interpretations (3) Studies the interpretive strategies and methods used by museums to communicate with visitors in museums, art galleries, historic sites, parks, and related places. Considers how interpretations contribute to cultural knowledge. Repeatable one time. Pre: consent. (Cross-listed as AMST 457) **DH**

ART 482 Women in Japanese Art (3) Issues relating to representations of women in Japanese art. Emphasis on social class and gender roles. Pre: 175, 176 or any WS course; or consent. (Cross-listed as WS 482) **DH**

ART 483 Applied Art of Japan (3) Ceramics, metalwork, lacquer, and textiles throughout Japanese history. Pre: 175 or 176, or consent. **DH**

ART 486 Early Chinese Painting (3) Stylistic and aesthetic development of two-dimensional arts; painting and calligraphy from prehistoric to 12th century. Pre: 175 or consent. **DH**

ART 487 (Alpha) Topics of Art in Late China (3) Chinese visual culture from the 13th century to the 20th century, with an emphasis on the non-representational pursuit in later Chinese painting; issues of identity, art production and the Chinese pursuit of modernity. (B) Literati painting and its political rhetoric; (C) From modern art to the Chinese version of postmodern art. Pre: 176 or consent. **DH**

ART 490 Comparative Aspects of Art (3) A seminar to compare modalities of form. Methodology: experiential, descriptive, semantic, structural, and historical. Pre: 175 and 176, or consent. **DA**

ART 491 (Alpha) Art of Southeast Asia (3) Critical analysis of the historical and cultural development of Buddhist and Hindu art in Southeast Asia; (B) island Southeast Asia; (C) mainland Southeast Asia. Pre: 175 or 176, or consent. **DH**

ART 492 Art of Ancient India (3) Critical analysis of the historical and cultural development of Indian architecture, painting, and sculpture. Pre: 175 or consent. **DH**

ART 493 Art of Islam (3) Major developments in art and architecture. Pre: 175 or consent. **DH**

ART 494 Photography: Critical Issues (3) Seminar on theoretical, ethical and aesthetic issues relating to the practice of photography,

past and present. A-F only. Pre: 396B or 396C, or consent. **DH**

ART 495 History of Modern Design (3) Major design movements in Europe and America from late 19th century to present; arts and crafts movement, art nouveau, modernist trends of the 20th century. Pre: 176 or consent. **DH**

ART 496 Topics in the History of Cinema (3) Specific period or national style of cinema studied in its historical context. Repeatable. Pre: 109 or consent. **DH**

ART 670 Art Historical Methodology (3) An introduction to art historiography, analytical techniques, and research methods and materials. Pre: consent and graduate standing.

ART 677 Art of Oceania (3) Arts from Polynesia, Melanesia, Micronesia explored in context of issues involving belief systems and cultural change. Repeatable one time. A-F only. Pre: 475C or consent.

ART 679 Art of Indonesia (3) Seminar: aspects of ethnic or tribal sculpture, textiles, architecture, painting. Pre: consent.

ART 687 Chinese Painting and Calligraphy (3) Research topics in the history of Chinese painting and calligraphy. Pre: consent.

ART 688 Chinese Sculpture and Applied Arts (3) Research topics in the history of Chinese sculpture, ceramics, bronzes, jade, and textiles. Pre: consent.

ART 695 (Alpha) Seminar in Western Art History (3) Selected topics in European and American art history. Pre: consent.

ART 780 Early Japanese and Korean Art (3) Emphasis on Buddhist art, 6th to 14th century; early secular painting. Lecture and seminar. Pre: consent.

ART 781 Later Japanese and Korean Art (3) Emphasis on secular art, 14th century to modern period. Lecture and seminar. Pre: consent.

ART 790 Buddhist Art of South Asia (3) Selected research topics in South and Southeast Asian Buddhist art. Pre: consent.

ART 791 Hindu Art of South Asia (3) Selected research topics in South and Southeast Asian Hindu art. Pre: consent.

CERAMICS

ART 242 Introduction to Ceramics (3) Three-dimensional concepts in clay; hand-building and wheel-throwing techniques. Projects, lectures, and demonstrations. **DA**

ART 343 Ceramics—Sculpture (3) Sculptural concepts and techniques specifically related to the medium of clay; advanced hand-building, throwing, glazing, and firing techniques. Repeatable once with consent. Pre: 242, or consent. **DA**

ART 344 Ceramics—Vessels (3) Exploration of the ceramic vessel as function, metaphor, and expression. Advanced hand-building, throwing, glazing, and firing techniques. Repeatable once with consent. Pre: 242, or consent. **DA**

ART 345 Ceramics—Low Temperature (3) Form and surface problems related to earthenware clay bodies and low-temperature glazes; mold-making for ceramics. Repeatable once with consent. Pre: 242, or consent. **DA**

ART 346 History of Western Ceramics (3) Western ceramics history from chronological, developmental, contextual, and theoretical standpoints; influence of Asian ceramics. Pre: 242, with 175 and 176 recommended, or consent. **DH**

ART 347 Technical Ceramics (3) Clay body development, glaze development, empirical and calculation methods. Emphasis on glaze maturity, surface, and color. Pre: 242, and one of 343, 344, or 345; or consent. **DA**

ART 440 Advanced Ceramics I (3) Ceramics practice and theory, practice of ceramics as it relates to issues in contemporary theory; individual projects and research. A-F only. Pre: 12 credits from 343, 344 and 345; or consent. **DA**

ART 441 Advanced Ceramics II (3) Advanced study in ceramics leading to the development, installation, and documentation of individual projects. Pre: BFA major and five 300-level ceramics courses; or consent. **DA**

DRAWING/PAINTING

ART 123 Introduction to Painting (3) Theory and practice of painting; material and technical procedures. **DA**

ART 213 Intermediate Drawing (3) Extension of 113 with emphasis on 20th-century issues. Pre: 113 or consent. **DA**

ART 214 Introduction to Life Drawing (3) Investigations of the figure concerning anatomical construction, light, space, diagrammatic analysis, and thematic content. Pre: 113 or consent. **DA**

ART 223 Intermediate Painting (3) Survey of late 19th- and 20th-century studio practice emphasizing developments in light notation, cubism, surrealism, and expressionism. Introduction to acrylic painting. Repeatable one time. Pre: 113 (or concurrent) and 123, or consent. **DA**

ART 224 Painting from Life (3) Painting from the model; a survey of the figurative tradition. Repeatable. Pre: 123 and 214 (or concurrent), or consent. **DA**

ART 225 Painting/Water-Based Media (3) An introduction to water-based media. Traditional transparent color, gouache and acrylics. Pre: 113 or consent. **DA**

ART 313 Advanced Drawing (3) Studio practice in drawing emphasizing 20th-century developments in art and independent research. Repeatable twice. Pre: 213 or consent. **DA**

ART 314 Intermediate Life Drawing (3) Further investigations of the figure concerning anatomical and diagrammatic construction, light, space, and thematic content. Pre: 214 or consent. **DA**

ART 320 Brush Art of the Far East (3) Brush techniques in classical painting and calligraphy; studio course. Pre: consent. **DA**

ART 321 Materials and Techniques of Painting (3) Experiments with various traditional and contemporary materials and procedures; discussion of their influences on painting. Pre: 123, 175, and 176; or consent. **DA**

ART 322 Advanced Color (3) Theory and application of color as related to studio practice. Pre: 115 or consent. **DA**

ART 323 Advanced Painting I (3) Studio practice in painting, emphasizing the development of abstract visual language and other 20th-century directions in art. Pre: 214, 223, and 224; or consent. **DA**

ART 414 Advanced Drawing from Life (3) Study of the figure with emphasis on the expressive function of drawing. Repeatable once. Pre: 214 or consent. **DA**

ART 423 Advanced Painting II (3) Development of greater formal means and aesthetic insight, emphasizing independent development. Repeatable once. Pre: 323 or consent. **DA**

FIBER

ART 103 Introduction to Fiber (3) Studio projects and demonstrations in basic loom weaving, indigo dyeing, and introductory non-loom fiber techniques. **DA**

ART 239 Intermediate Fiber (3) Studio emphasis on woven structure and on surface design using resist methods, direct printing, and embellishment techniques. Exploration in two and three dimensions. Repeatable one time. Pre: one of the following: 103, 104, 113, 115, or 217; or consent. **DA**

ART 335 Papermaking (3) Studio emphasis on handmade papermaking techniques, conceptual exploration in two and three dimensions. Repeatable one time. A-F only. Pre: one of the following: 103, 104, 113, 115, 217, or 239; or consent. **DA**

ART 336 Fiber—Wearable Art (3) Art for the body will draw inspiration from world costume and from a variety of three-dimensional fiber forms. Repeatable one time. A-F only. Pre: one of the following: 103, 104, or 116; or consent. **DA**

ART 337 Fiber—Sculpture (3) Mixed-media and non-loom techniques. Exploration of ideas in contemporary basketry and other sculptural forms. Repeatable one time. A-F only. Pre: 103, 116, or 239; or consent. **DA**

ART 339 (Alpha) Advanced Fiber (3) Exploration of fiber art as an expressive medium, emphasizing individual approaches and concepts in studio projects; (B) structure; (C) surface. Repeatable once each alpha. A-F only. Pre: (B) 394B or 394C and 239, 337; or consent; (C) 394B or 394C and 239, 335, or 336; or consent. **DA**

ART 394 (Alpha) History of Textiles (3) Textile history up to contemporary fiber art, with reference to the technical process. (B) Europe and the Americas; (C) Oceania, Asia, the Middle East, and Africa. Pre: 175 and 176; or consent. **DH**

ART 437 Textile Conservation/Research (V) Independent study of textile conservation and research. Individualized directed work (internship/practicum) in the museum environment. Repeatable up to twelve credits. A-F only. Pre: 239, 394B, or 394C; and consent. **DA**

ART 439 Advanced Fiber II (3) Advanced study in fiber leading to the development, installation, and documentation of individual projects. Repeatable. A-F only. Pre: 339 and portfolio review; or consent.

GLASS

ART 130 Introduction to Glass (3) Basic techniques of working with cold and molten

glass. Theory of glass studio operation and introduction to glass theory. **DA**

ART 230 Glass Casting: Sand and Metal Molds (3) Expressive explorations in glass casting with wet sand, bonded sand, and metal molds. Repeatable once. Pre: 116 (or concurrent) and 130; or consent. **DA**

ART 234 Cold Glass Fabrication (3) Expressive explorations using architectural sheet glass. Development of 2D and 3D forms using engraving, sandblasting, and cold joinery techniques. Pre: 113 (or concurrent), 116 (or concurrent), and 130; or consent. **DA**

ART 303 Kiln-Formed Glass (3) Expressive explorations in the use of kiln-formed, fusible-sheet glasses and enameling on glass. Pre: 234 or consent. (Fall only) **DA**

ART 306 Lost Wax Glass Casting (3) Glass kiln casting techniques, lost wax fuse casting, pâte de verre. Repeatable once. Pre: 230, 254, and 356 (or concurrent); or consent. **DA**

ART 330 Advanced Glass (3) Glass as an expressive medium. Individual problems; construction of studio equipment. Readings and discussions of contemporary glass issues. Repeatable once. Pre: 230, 254, and 356; or consent. **DA**

ART 430 Advanced Glass II (3) Advanced study in glass leading to the development, installation, and documentation of individual projects. Pre: 330 or consent. **DA**

GRAPHIC DESIGN

ART 265 Design: Studio I (3) Introduction to graphic design. Explorations of rhetorical and semiotic structures and their relationship to visual form and content. A-F only. Pre: 115 or consent. Co-requisite: 265L. **DA**

ART 265L Design: Studio I Lab (1) Beginning instruction in the Macintosh computer environment, including hardware, software, and lab networking as it relates to graphic design production. CR/NC only. Pre: 115 or consent. Co-requisite: 265. **DA**

ART 266 Design: Typography I (3) Introduction to typography. Exploration of letterform and word compositions in the context of single-page structures. A-F only. Pre: 115 or consent. **DA**

ART 360 Exhibit Design and Gallery Management (3) Design theory and techniques for presentation of artworks and mounting exhibitions. Pre: 115, junior standing, and consent. **DA**

ART 365 Design: Studio II (3) Intermediate graphic design. Emphasis on communication problems involving process and analysis. Introduction to modernist precedents and information theory. A-F only. Pre: 265 and 266; or consent. **DA**

ART 365L Design: Studio II Lab (1) Intermediate instruction in the Macintosh computer environment, software, and peripheral devices, including intermediate layout. Introduction to graphic design industry standard multi-media and web design programs. CR/NC only. Pre: 265, 265L, and 266; or consent. Co-requisite: 365.

ART 366 Design: Typography II (3) Intermediate typographic design, exploration of word and text composition in the context of multiple-page structures. A-F only. Pre: 265, 266, and 365 (or concurrent); or consent. **DA**

ART 465 Design: Studio III (3) Advanced graphic design. Emphasis on postmodernist theory, context, audience, and alternative media. A-F only. Pre: 365, 365L, and 366; or consent. Co-requisite: 465L. **DA**

ART 465L Design: Studio III Lab (1) Advanced instruction in the Macintosh computer environment, including software and peripheral devices. Instruction in image manipulation and editing still video images for the web, CD, DVD, and portable interface devices. CR/NC only. Pre: 365, 365L, and 366; or consent. Co-requisite: 465.

ART 466 Design: Typography III (3) Advanced typographic design. Exploration of 2D, 3D, electronic, and intermedia. Emphasis on contemporary typographic models. A-F only. Pre: 365, 365L, and 366; or consent. **DA**

ART 467 Design: Production Techniques (3) Advanced techniques in design production from printed and digital media. A-F only. Pre: 465, 465L, and 466; or consent. **DA**

ART 468 Design: Thesis Project (3) Thesis project. A-F only. Pre: 465 and 466, or consent.

PHOTOGRAPHY

ART 109 Understanding Image in Motion (3) Creative aspects of film and video. Understanding forms, aesthetics, and techniques of the moving image; feature and short works (animation, documentary, and experimental). A-F only. **DA**

ART 206 Understanding Photography (3) Studio/lecture course examining the major themes and issues in historical and current photographic production. Direct black and white darkroom experience. Students must have 35mm film-based camera with adjustable shutter speed, aperture, and light meter. **DA**

ART 207 Intermediate Photo: Black and White (3) Black and white photography emphasizing communication and self-expression. Lectures, demonstrations, and projects. Student must supply camera and material. Pre: 206. **DA**

ART 209 Image in Motion Studio I (3) Basic theory, practice, and techniques for animation, with sequential digitized imagery and synchronized sound. Repeatable one time with consent. A-F only. Pre: 206 or consent. **DA**

ART 307 Advanced Camera and Lighting (3) Emphasis on aesthetic and critical analysis. Techniques covered include large-format camera and studio lighting. Repeatable one time with consent. Pre: 207 and positive portfolio review or consent. **DA**

ART 308 (Alpha) Advanced Photographic Techniques (3) Emphasis on aesthetic and critical analysis. (B) Color; (C) Hand-applied emulsion. (B) and (C) Repeatable one time with consent. Pre: 207 and positive portfolio review. **DA**

ART 309 Image in Motion Studio II (3) Advanced theory, practice, and techniques for sequential imagery with synchronized sound, using animation and live action video. Repeatable. A-F only. Pre: 209 and positive portfolio review; or consent. **DA**

ART 407 Advanced Photography: BFA Seminar (3) Advance study in photography leading to the development, exhibition and documentation of individual projects. A-F only. Pre: five of the following: 109, 207, 209, 307,

308B, 308C, 309, or 409; and positive BFA review. **DA**

ART 409 Image in Motion Studio III (3) Studio/lecture course focusing on conceptualization and production of computer generated three-dimensional animation. A-F only. Pre: 309 or consent. **DA**

PRINTMAKING

ART 104 Introduction to Printmaking (3) Foundation explorations in the processes of relief, intaglio, and stencil printmaking. Direct workshop studio experience in the basic techniques and concepts of wood cut, linoleum cut, drypoint, monotype, and basic stencil processes. **DA**

ART 215 Intaglio Printmaking (3) Studio practice in concepts and techniques of making prints from metal plates including etching, engraving, aquatint, and drypoint. Pre: 104 or 113. **DA**

ART 216 Lithography (3) Studio practice in concepts and techniques of making prints from lithographic limestone and plates. Pre: 104 or 113. **DA**

ART 217 Screenprinting (3) Studio practice in screenprinting on paper. Copy camera and basic photo-stencil techniques introduced. Pre: 104 or 113. **DA**

ART 218 Relief Printmaking (3) Studio practice in the techniques and concepts of woodblock, linoleum cut, monotype, and collagraph printmaking. Emphasis on both traditional and contemporary practices. Pre: 104 or 113, or consent. **DA**

ART 318 Intermediate Printmaking (3) Intermediate level specialization in either intaglio, lithography, screenprinting, or relief printmaking. Concentration on the techniques and formats of color printing and sequential image development. Repeatable. Pre: two printmaking courses and portfolio review, or consent. **DA**

ART 418 Advanced Printmaking (3) Advanced work in intaglio, lithography, screenprinting, or relief printmaking. Emphasis on experimental processes, large-scale execution, and technical research. Repeatable. Pre: 318 and portfolio review, or consent. **DA**

SCULPTURE

ART 254 Sculpture—Metal Casting (3) Metal casting and development of associated practices and concepts. Repeatable. Pre: one of 103, 105, 116, or 130; or consent. **DA**

ART 255 Sculpture—Carving, Mixed Media (3) Investigations of traditional and contemporary carving concepts and methods. Repeatable. Pre: one of 103, 105, 116, or 130; or consent. **DA**

ART 351 Sculpture—Figure Modeling (3) Figure modeling, mold making, and casting. Repeatable. Pre: 214 or 243, or consent. **DA**

ART 352 Kinetic Sculpture (3) The design and construction of objects incorporating movement as an integral element of their content. Repeatable once. Pre: any two of 254 (or concurrent), 356, or 357; or consent. **DA**

ART 356 Sculpture—Metal Fabrication (3) Metal fabrication and development of associated practices, concepts, and historical references.

Repeatable. Pre: one of 103, 105, 116, or 130; or consent. **DA**

ART 357 Sculpture—Small-Scale (3)

Fabrication and casting of forms on a small scale such as jewelry. The development of related practices, concepts, and historical references. Repeatable. Pre: one of 103, 105, 116, or 130; or consent. **DA**

ART 358 Utilitarian Sculpture (3) The design and construction of objects intended for use/interaction. Emphasis on wood and synthetic materials. Repeatable once. Pre: 116 or consent. **DA**

ART 359 Sculpture—Contemporary (3)

Contextualization of late 20th/early 21st century sculptural practice, including stylistic and theoretical frameworks, with references to influences of various historical Western and Asian traditions and applying this knowledge in the creation of sculpture. Pre: 116 and 176, or consent. **DA**

ART 452 Advanced Sculpture (3) Individual projects. Seminar. Repeatable. Pre: five courses from 230, 243, 254, 255, 337, 351, 352, 356, 357 or 358; or consent. **DA**

ART 453 Advanced Sculpture II (3) (6 hr Lec/Lab combined) Advanced study in sculpture leading to the development, installation, and documentation of individual projects. Pre: 452 or consent. **DA**

VARIABLE CREDIT COURSES

ART 399 Directed Work (V) Individual projects; tutorial. Maximum: 3 credit hours per semester; total 6 for BA, 9 for BFA. Pre: two 200-level or above art courses in area of directed work, as well as consent of instructor and department chair.

ART 400 Special Projects (V) Intensive and specialized work at advanced level in fields of special interest of visiting or resident faculty. Repeatable. Pre: advanced standing and consent.

ART 630 Graduate Studio Teaching

Practicum (3) Observation, analysis and participation in teaching a lower division course under the direction of an instructor in the student's area of concentration. Repeatable one time. A-F only. Pre: 690, admitted to candidacy for MFA in art, and consent.

GRADUATE STUDIOS

Studio concentrations for the Master of Fine Arts degree: ceramics, electronic arts, glass, fiber, graphic design, painting, photography, printmaking, and sculpture. Three sequential course levels are offered in each area, normally with 6 credit hours at level I prerequisite to level II, etc. Courses are repeatable; each carries a maximum of 6 credit hours per semester, and each requires consent of instructor. Conditional and unclassified students enroll at level I only.

Content at level I emphasizes creative exploration through research and evaluation in a personal direction; level II encourages development through analysis and definition; level III focuses on refinement and synthesis.

ART 500 Master's Plan B/C Studies (1)

Enrollment for degree completion. Pre: master's Plan B or C candidate and consent.

ART 601, 602, 603 Electronic Arts I, II, III (V)

ART 607, 608, 609 Photography I, II, III (V)

ART 615, 616, 617 Printmaking I, II, III (V)

ART 623, 624, 625 Painting I, II, III (V)

ART 631, 632, 633 Glass I, II, III (V)

ART 637, 638, 639 Fiber I, II, III (V)

ART 641, 642, 643 Ceramics I, II, III (V)

ART 653, 654, 655 Sculpture I, II, III (V)

ART 665, 666, 667 Graphic Design I, II, III (V)

ART 699 Directed Work (V) Advanced individual projects; advanced tutorial. Maximum: 3 credit hours per semester; total 6 for MA Plan A, 9 for MA Plan B, 9 for MFA. Pre: consent of instructor and department chair.

ART 700 Thesis Research (V)

Arts and Humanities (AH)

College of Arts and Humanities

AH 100 Introduction to the Arts (3) Team-taught interdisciplinary exploration of dance, music, theater, and visual art as means of perceiving, organizing, and communicating. Lectures, performances, field trips, group and individual participation. **DA**

Arts and Sciences (CAS)

Colleges of Arts and Sciences

CAS 099 International Exchange (V)

Designed for students accepted for participation in an international exchange program while enrolled at UH Mānoa. CR/NC only. Pre: Admittance to an international exchange program.

CAS 101 RAP Foundation Course (3) Focus on communication and research skills.

Multilevel work with technology, community service, linking with K–12 students, creation of museum exhibits. A–F only. Open only to RAP students.

CAS 102 RAP Foundation Course (3) Focus on communication and research skills.

Multilevel work with technology, community service, linking with K–12 students, creation of museum exhibits. A–F only. Open only to RAP students.

CAS 110 Integrating Seminar I (1) An introduction to the university community; topics include critical thinking, the value of higher education, cultural and transition issues. A–F only.

CAS 111 Integrating Seminar II (1) Through the use of a unifying theme, students explore linkages with academic disciplines represented in Freshman Learning Communities. Theme examples: diversity, epistemology. A–F only. Spring only.

CAS 200 (Alpha) Scholar Seminars (1)

Discussion-based seminar led by senior faculty/administrator. Students meet with instructor for 1 hour once a week. Freshmen may take up to three alphas.

CAS 301 ACE Mentoring: Facilitating

Student Development (4) Theoretical foundations in student learning and holistic development. Practical leadership skills

acquisition and application through the facilitation of a seminar for new freshmen. Repeatable one time. A–F only. Pre: consent. Fall only.

AS

See Aerospace Studies

Asian Studies (ASAN)

School of Hawaiian, Asian, and Pacific Studies

ASAN 201 Introduction to Asian Studies:

East Asia (3) Understanding East Asia through multidisciplinary approaches. Examines the interrelationship of policies, economy, literature, religion, the arts, and history as the basis for such an understanding. **DH**

ASAN 202 Introduction to Asian Studies:

South/Southeast Asia (3) Understanding South and Southeast Asia through multidisciplinary approaches. Examines the interrelationship of policies, economy, literature, religion, the arts, and history as the basis for such an understanding. **DH**

ASAN 241 Civilizations of Asia (3) Historical survey of major civilizations of Asia from earliest times: East Asia, Southeast Asia, and South Asia. (Cross-listed as HIST 241) **DH**

ASAN 242 Civilizations of Asia (3) Continuation of 241. (Cross-listed as HIST 242) **DH**

ASAN 308 Contemporary Chinese Politics

(3) Interdisciplinary review and analysis of the social and political issues in contemporary China, the interchange between state and society in national policies, the relationship between cultural tradition and technological modernization in the social transformation process. A–F only. Pre: 310 or 312 or SOC 356 or consent. (Cross-listed as POLS 308) **DS**

ASAN 310 Asian Humanities (3)

Multidisciplinary. Classics of literature, philosophy, and religion shaping Asian beliefs and values. Pre: 201 and 202, or consent. **DH**

ASAN 312 Contemporary Asian Civilization

(3) Multidisciplinary examination of problems and issues affecting peoples and institutions of contemporary Asia: ethnic, language, religious, and cultural differences; population growth; public health; economic development; political and social change; environmental problems; etc. Pre: 201 and 202, or consent. **DS**

ASAN 320 (Alpha) Asian Nation Studies (3)

Multidisciplinary examination of major Asian countries; cultural, social, economic, and political lives of their peoples. (C) China; (I) South Asia; (J) Japan; (K) Korea; (P) Philippines; (S) Southeast Asia; (Z) Other. Pre: 201 and 202, or consent. **DS**

ASAN 323 The Way of Tea in Japanese

History and Culture (3) History and culture of Japan as revealed in study and practice of tea ceremony: Zen, aesthetics, calligraphy, architecture, ceramics, gardens, politics. (Cross-listed as HIST 323) **DH**

ASAN 324 Chado—the Way of Tea Practicum

(1) Actual practice of the tea ceremony as history and culture of Japan. Repeatable one time. Pre: 323, HIST 323 (or concurrent), or consent. **DA**

- ASAN 325 (Alpha) Japanese Film: Art and History (3)** Study and analysis of Japanese film; its history and relationship to cultural, social, philosophical, and aesthetic contexts. (B) 1900-1960; (C) 1960-present; (D) special topics. Pre: upper division standing or consent. (Cross-listed as EALL 325) **DH**
- ASAN 330 Chinese Film: Art and History (3)** Study and analysis of Chinese film; its history and relationship to cultural, social, philosophical, and aesthetic contexts. Pre: 201 and 202, or consent. **DH**
- ASAN 361 Southeast Asian Literature in Translation (3)** Survey in English traditional and modern literatures of Southeast Asia. A-F only. (Cross-listed as IP 361) **DL**
- ASAN 393 (Alpha) Field Study in Asia (3)** Students may submit proposals to have academic course work, field research, or work experience in Asia. See specific center for guidelines and procedures. (C) China; (I) South Asia; (J) Japan; (K) Korea; (P) Philippines; (S) Southeast Asia; (Z) Other.
- ASAN 458 Russia in Asia and the Pacific (3)** Covers the economic, political, and social development of Russian Asia (Siberia) and Russian relations with the countries of Asia and the Pacific. Pre: HIST 306 or HIST 310; or consent. **DH**
- ASAN 462 Contested Issues in Contemporary Japan (3)** Familiarizes students with public discourse in Japan by analyzing key current issues widely debated in the Japanese media and in public forums in light of their political, historical, cultural, social and economic contexts. A-F only. Pre: 201-202, 312, 320J, ANTH 483, ANTH 484, ECON 317, POLS 307H, or SOC 357, upper level undergraduate standing; or consent. (Once a year) **DS**
- ASAN 463 Gender Issues in Asian Society (3)** Construction of gender identities in contemporary Asia. How these interface with other aspects of social difference and inequality (e.g., with class, religion, ethnicity). Pre: 201 and 202, or any WS course, or consent. (Cross-listed as WS 463) **DS**
- ASAN 465 American Experience in Asia (3)** Comparison of American experiences in Japan, China, and Southeast Asia within historical and perceptual framework. (Cross-listed as AMST 465) **DH**
- ASAN 467 Americans in China (3)** Exploration of contemporary Chinese-American relationship against 19th- and 20th-century background. **DH**
- ASAN 469 Ethnic Diversity in China (3)** Surveying Tibetans, Mongols, Manchus, Muslims, and other minorities, as well as analyzing the nature of minority/majority identity in China from an anthropological perspective. Pre: 201 and 202, or consent. **DS**
- ASAN 470 Sustainable Development in East Asia (3)** Interdisciplinary investigation of development in East Asia as an urgent issue. Focus on economic, environmental and cultural aspects. Includes China, Japan, Korea, Taiwan, Hong Kong and Thailand/Indonesia. A-F only. Pre: 201 or 312 or consent. (Cross-listed as FIN 470)
- ASAN 473 Chinese Diaspora and Visual Media (3)** Course focuses on the role of visual media in shaping social relationships and cultural practices of Chinese communities living in Taiwan, Hong Kong, Southeast Asia, Europe, and Northern America. Includes examinations of films, theatre and musical productions, video-culture, art exhibitions, and photography. Pre: any 300-level course in AMST, EALL, ENG, ES, or WS; or consent. (Cross-listed as EALL 473) **DH**
- ASAN 474 Transnational Chinese Popular Culture (3)** Course surveys a variety of Chinese popular cultural forms which are transnational in nature, i.e. extending beyond the national boundaries of the PRC. The cultural influences of Taiwan, Hong Kong, and Singapore will be traced through examining soap-operas, karaoke-culture, rock music, martial arts, commercial novels, video games, and children animation. Pre: any 300-level course in AMST, EALL, ENG, ES, or WS; or consent. (Cross-listed as EALL 474) **DH**
- ASAN 480 Culture and Economy of Southeast Asia (3)** An exploration of the cultural and economic development of the countries of Southeast Asia from early times to the present day, with an emphasis on the effects of outside influences. Pre: 201 and 202, or consent. **DH**
- ASAN 482 The Political Economy of Japan (3)** Examination of the institutions of the contemporary Japanese political economy including economic policy and politics, labor-management relations, and international dimensions. Pre: 201 and 202, or consent. **DS**
- ASAN 485 Contemporary Chinese Development (3)** Development and planning in contemporary China: economic policy and institutional structure in the development and urbanization process; urban and rural transformation in a socialist economy. Pre: upper division standing or consent. **DS**
- ASAN 486 Contemporary Vietnam (3)** Vietnam's 20th-century intellectual and organizational transformation, wars, revolution, social change, and development dilemmas in historical, cultural, and international perspective. **DS**
- ASAN 491 (Alpha) Topics in Asian Studies (3)** Selected topics in Asian studies. (B) Buddhist studies; (C) China; (G) Asia; (I) South Asia; (J) Japan; (K) Korea; (P) Philippines; (S) Southeast Asia; (Z) Other. Pre: 201 or 202, or consent. **DS**
- ASAN 493 Globalization in Asia (3)** Globalization affects the economic, political, and cultural lives of people in Asia. Transformations by capitalism in agricultural and industrial sectors of contemporary societies. Perspective is historical and global; approach is interdisciplinary. Repeatable twice. Pre: 201 and 202, or consent. **DS**
- ASAN 495 Encountering Tourism in Asian-Pacific Societies (3)** A critical examination and current impact of tourism on contemporary Asian and Pacific Island societies. Topics include colonial antecedents, social impacts, cultural and environmental concerns, case studies (including Hawai'i). Pre: 201 or 202, or consent. (Cross-listed as PACS 495) **DS**
- ASAN 496 Religions of Island Southeast Asia (3)** A comparative, interdisciplinary examination of indigenous beliefs, Islam, Christianity, and Hinduism in island Southeast Asia, and how they have been adjusted because of economic and social change. Pre: 201 and 202, or consent. **DH**
- ASAN 497 Religion and National Identity in SEA (3)** A major question in Southeast Asia is, does national identity preempt religion, or does religion preempt national identity? The aim is to raise and examine issues related to these queries. Pre: upper division standing.
- ASAN 499 Directed Reading (V)** Pre: consent.
- ASAN 500 Master's Plan B/C Studies (1)** Enrollment for degree completion. Pre: master's Plan B or C candidate and consent.
- ASAN 501 Practicum in Asian Studies (V)**
- ASAN 600 Asian Studies Seminar: Scope and Methods (3)** Scope of Asian studies as a field; contributions of major disciplines to study of Asia; resources and methods of research; preparation of research proposal. (C) China; (I) South Asia; (J) Japan; (K) Korea; (P) Philippines; (S) Southeast Asia. Pre: graduate standing.
- ASAN 603 Japanese Studies Seminar (3)**
- ASAN 605 Contemporary Korean Studies Seminar (3)** Critical examination and study of selected aspects of modern and contemporary Korea. Pre: HIST 328.
- ASAN 608 Politics and Development: China (3)** Political economy of market transformation in China; developmental context of human resource, cultural tradition, ideology, policy issues of agriculture industry transfer, decentralization, dualism, market reform in urbanization, social service, foreign investment, and Greater China. Pre: one of 600, 635, POLS 308, POLS 341, or PLAN 635; or consent. (Cross-listed as POL 645C)
- ASAN 611 Comparative Muslim Societies in Asia (3)** This course will compare Muslim societies and cultures in Asia with each other and with the so-called "core" Middle Eastern Muslim societies. Pre: 600 or consent.
- ASAN 618 Contemporary China: Development and Culture (3)** Selected topics on contemporary China. Center for Chinese Studies has details of current offering. May be repeated with permission of instructor. Pre: 312 or 320C, or consent.
- ASAN 620 Problems/Issues of Contemporary Asia (3)** Analysis from multidisciplinary perspective: rural development, urbanization, international relations, ethnicity, religion, language, etc. Pre: 312 or consent.
- ASAN 624 Culture and Colonialism (3)** Analysis of theories and debates (cultural studies, feminist writings, post-colonial issues). Case studies of the transformation and creation of "traditional" cultures under colonialism. Pre: 310 or 312, or consent.
- ASAN 625 Comparative Development in East and Southeast Asia (3)** Comparative developmental analysis of Asia's leading economic powers. Considers Japanese political and economic developmental model; discusses problems for continued Asian growth; examines Korea, Taiwan, China, Indonesia, Thailand, Philippines and other Asian nations. Pre: 312, 600, or consent.
- ASAN 626 Capitalism in Contemporary Asia (3)** Historically grounded theoretical examination of capitalism in 20th-century Asia; multidisciplinary approach to fundamental change in political and economic structures and

institutions, prospects for the future. Pre: 600 or 625, or consent.

ASAN 627 Ethnic Nationalism in Asia (3) Contemporary theories of ethnic and cultural nationalism from perspective of Asia. Issues of nation-state, power hierarchies, modernity, and identity in contemporary societies. Pre: 310 (or concurrent) or 312 (or concurrent), or consent.

ASAN 628 Southeast Asian Development: Costs and Benefits (3) Interdisciplinary approach to broad economic, social, and political issues. Focus on benefits and costs of economic development and effects on local cultures. Exploration of dilemmas of modernization and comparison of societal responses to development. Repeatable. Pre: 312 or consent.

ASAN 635 Industrialization and Development Planning in Asia and Pacific (3) Political economy of industrialization and development, state and society under industrialization and post-industrialization, evolution of development planning, and policy making in Asia under global economy. Pre: 312, 600 or PLAN 630, or consent. (Cross-listed as PLAN 635)

ASAN 636 Culture and Urban Form in Asia (3) Cultural and historical impact on urban form, contention of tradition and modernity in urban space, spatial expression of state and society, perception and utilization of urban design, evolution of urban form in selected Asian capitals. Pre: 312, ARCH 341, PLAN 310, or PLAN 600. (Cross-listed as ARCH 687 and PLAN 636)

ASAN 638 China's Economic and Regional Development (3) A review of contemporary China's economic and regional development, examining the changing plans, policies and performances in the Socialist Development and Market Transition eras, and the implications on spatial patterns. A-F only. Pre: GEOG 353 or PLAN 630 or consent. (Cross-listed as GEOG 638 and PLAN 638)

ASAN 639 Planning for Rural Development (3) Rural development theories and policies. Planning and spatial aspect of Asian and Pacific development: integrated development, agropolitan development and rural industrialization. Pre: PLAN 630 or consent. (Cross-listed as GEOG 639 and PLAN 639)

ASAN 651 East Asia Now (3) Views East Asia as an interactive region. Examines common historical and cultural, economic and political themes including various experiences with the West. Focus upon present state of the region. A-F only. Pre: 310, 312, or consent.

ASAN 652 Contemporary Japanese Studies Seminar (3) Selected human and physical features that represent economic, social, and political life. Pre: consent. (Cross-listed as GEOG 652)

ASAN 671 The Splendor that was Southeast Asia (3) Interdisciplinary examination of the classical civilizations of Southeast Asia, the 9th to 14th centuries. Includes Pagan, Sukhothai, Angkor, Dai Viet, Srivijaya, and Majapahit. Considers historical themes and patterns, issues in Southeast Asian studies. A-F only. Pre: 310, 312, or consent.

ASAN 672 Demographic History of Southeast Asia (3) Southeast Asian population histories. Contrasts with East and South Asian population histories. Links among demography,

subsistence activities and social institutions. Evolution of indigenous and colonial population records. Practical applications of historical demographic methodology. A-F only. Pre: graduate standing or consent. (Cross-listed as PPST 672)

ASAN 694 Topics in Buddhist Studies (3) Seminar on selected topics in Buddhist studies. Pre: PHIL 360, PHIL 406, REL 475, or REL 490; or consent.

ASAN 699 Directed Research (V) Individual problems and research. Pre: consent.

ASAN 700 Thesis Research (V)

ASAN 705 Asian Research Materials and Methods (3) Bibliography, reference tools, and research methods in sources on Asia in Western and Asian languages. Discussion of published and archival repositories. (Cross-listed as HIST 705 and LIS 705)

ASAN 750 (Alpha) Research Seminar in Asian Studies (3) (C) China; (I) South Asia; (J) Japan; (K) Korea; (P) Philippines; (S) Southeast Asia. Pre: 600 or consent.

Astronomy (ASTR)

College of Natural Sciences

ASTR 110 Survey of Astronomy (3) Introduction to the astronomical universe: sky and celestial objects, planetary motion, planets and the Solar System, Sun and stars, the Milky Way and galaxies, cosmology and the universe. Credit not given for both 110 and 120. DP

ASTR 110L Survey of Astronomy Laboratory (1) Observations of constellations and the night sky, the sun and moon, planets, stars, and deep-sky objects; laboratory and observational experiments illustrating basic concepts in astronomy. Offered in the evening. Pre: 110 (or concurrent); or consent. DY

ASTR 120 Astronomical Origins (3) Formation of the sun and stars; origin of our solar system; formation and evolution of galaxies, including the Milky Way Galaxy; origin of chemical elements, and the beginnings of the cosmos. Credit not given for both 110 and 120. A-F only. DP

ASTR 130 Introduction to Archaeoastronomy (3) Astronomy and celestial lore in ancient cultures: Neolithic Europe, Mayan, Mesoamerican, Egyptian, Mesopotamian, American Indian, Chinese, and Polynesian. Concepts of the cosmos, calendars, eclipse predictions, motion of celestial bodies, and navigation. Construction of simple observing tools. DP

ASTR 150 Voyage through the Solar System (3) An illustrated voyage through the solar system. The origin, evolution, and present state of the sun and each planet based on recent results. Spring only. (Cross-listed as GG 105) DP

ASTR 240 Foundations of Astronomy (3) Introduction to the astronomical universe for science or engineering students. Satisfies requirements for non-introductory level credit. Pre: PHYS 151 or PHYS 170; or consent. Credit not given for both 110 and 240. DP

ASTR 280 Evolution of the Universe (3) The Big Bang, origin of the elements, formation and

evolution of galaxies and stars. Pre: any introductory astronomy or physics course, or consent. DP

ASTR 281 Astrobiology (3) Are we alone in the universe? Modern astronomical, biological, and geological perspectives on this fundamental question. Searches for life on Mars, oceans on Europa, planets orbiting other stars. Space exploration and colonies, interstellar spaceflight and communication. Pre: 110 or 240 or consent. Spring only. DP

ASTR 399 Directed Study (V) Individual reading, observation, or experimentation in astronomy and astrophysics. Repeatable four times. Pre: consent.

ASTR 427 Cosmology (3) Structure, history, and composition of the universe; the Big Bang; formation and evolution of galaxies, clusters, and large-scale structure; cosmological models. Given concurrently with 627. Pre: PHYS 274 or consent. Spring only. (Alt. years) DP

ASTR 430 The Solar System (3) Observations and physical nature of planets and moons, asteroids, comets, and other small bodies; formation of the Solar System; discovery of other planetary systems; solar activity. Given concurrently with 630. Pre: PHYS 170 or consent. Spring only. (Alt. years) DP

ASTR 500 Master's Plan B/C Studies (1)

ASTR 622 The Interstellar Medium (3) Astrophysics of diffuse matter, HII regions, molecular clouds, etc. Pre: consent. (Alt. years)

ASTR 623 Stellar Interiors and Evolution (3) Structure and evolution; energy sources, radiative processes; relations to observables. Pre: consent. (Alt. years)

ASTR 626 Galaxies (3) Observations and stellar dynamics of elliptical and spiral galaxies including our galaxy, globular clusters, and dark matter. Galaxy formation and evolution. Pre: consent. Spring only. (Alt. years)

ASTR 627 Cosmology (3) Geometry and evolution of the universe. Dark matter. Early universe. Formation of large-scale structure, galaxies, and clusters. Cosmological models. Pre: consent. (Alt. years)

ASTR 630 The Solar System (3) Survey of observational data and physical concepts on planets and smaller bodies; formation of planetary systems; solar activity. Pre: consent. (Alt. years)

ASTR 631 Radiative Transfer Stellar Atmospheres (3) Excitation, ionization, and radiative transfer in stellar atmospheres; model atmospheres, formation of line and continuum radiation. Pre: consent. (Alt. years)

ASTR 633 Astrophysical Techniques (3) Telescopes, positional astronomy, photon detection, error analysis, photometry, spectroscopy. Pre: consent. Fall only.

ASTR 635 Fundamentals of Astrophysics (3) Applications of fundamental physics to astrophysical situations. Elements of general relativity. Basics of hydrodynamics and shock waves. Radiative processes, high energy astrophysics. Modern dynamics. Pre: consent. Fall only.

ASTR 640 General Relativity (3) Introduction to gravity and general relativity. Tensor basics, classical scalar, vector and tensor field theories. Exact symmetric Einstein equation, gravito-

magnetic weak field, and radiation solutions. Pre: consent. (Alt. years)

ASTR 641 Active Galaxies (3) Phenomenology of active galactic nuclei, black holes, accretion flows and jets, emission mechanisms, host galaxies, and cosmic evolution. Pre: 635 or consent. Spring only. (Alt. years)

ASTR 657 Astrochemistry - A Molecular Approach (3) Formation of astrobiologically important molecules and their precursors in the interstellar medium and in our solar system: first principles and latest trends. Pre: consent. Fall only. (Cross-listed as CHEM 657 and GG 657)

ASTR 699 Directed Research (V) Pre: consent.

ASTR 700 Thesis Research (V)

ASTR 734 Astronomy Seminar I (V) Selected advanced topics in astronomy and astrophysics. Available for 1 to 3 credit hours by arrangement. Repeatable. Pre: consent.

ASTR 735 Astronomy Seminar II (V) Selected advanced topics in astronomy and astrophysics. Available for 1 to 3 credit hours by arrangement. Repeatable. Pre: consent.

ASTR 736 Astronomy Seminar III (V) Selected advanced topics in astronomy and astrophysics. Available for 1 to 3 credit hours by arrangement. Repeatable. Pre: consent.

ASTR 800 Dissertation Research (V)

BE

See *Bioengineering*

BEC

See *Business Economics*

Biochemistry (BIOC)

School of Medicine

Adequate preparation in chemistry (through physical chemistry), physics, and mathematics is required, and a background in biological sciences is desirable.

BIOC 241 Fundamentals of Biochemistry (3) Biological chemistry stressing integration of concepts of general, inorganic, and biochemistry and application to life chemistry. Pre: beginning algebra and high school science. **DP**

BIOC 341 Elements of Biochemistry (3) Biochemical principles and concepts as applied to living systems, including sufficient organic chemistry to understand these principles. Pre: 241 or consent. **DP**

BIOC 441 Basic Biochemistry (4) Function and composition of biological substances and their metabolic transformation in animals, plants, microorganisms. Pre: BIOL 275/275L, CHEM 273, or consent. (Cross-listed as BIOL 441) **DB**

BIOC 441L Basic Biochemistry Lab (1) Experiments working with substances discussed in 441. **DY**

BIOC 471 Clinical Biochemistry (4) Biochemical processes in human health and disease states. Repeatable one time. Pre: 441 or

BIOL 405 or CMB 405. Spring only. (Cross-listed as MEDT 471) **DB**

BIOC 481 Introduction to Molecular Biology (3) Biochemical basis of life presented in terms of the structure and function of the gene in the production of biological catalysts. Pre: 441 or consent. **DB**

BIOC 499 Directed Research and Reading (V) Independent research or selected reading of current literature in the area of biochemistry and biophysics. Pre: consent.

BIOC 500 Master's Plan B/C Studies (1) Enrollment for degree completion. Pre: master's Plan B or C candidate and consent.

BIOC 512 (Alpha) Unit II Electives in Biochemistry (1) Concurrent electives in biochemistry. (B) carbohydrate biochemistry (review and clinical correlation of important aspects of biochemistry and carbohydrate chemistry); (D) introduction to magnetic resonance imaging (how the generation and processing of the magnetic signal produces strikingly clear anatomical images); (E) topics in carcinogenesis (review of current understanding of cancer cause and prevention). Repeatable. Pre: BIOM 551.

BIOC 513 (Alpha) Unit III Electives in Biochemistry (1) Concurrent electives in biochemistry. (B) carbohydrate biochemistry (review and clinical correlation of important aspects of biochemistry and carbohydrate chemistry); (D) introduction to magnetic resonance imaging (how the generation and processing of the magnetic signal produces strikingly clear anatomical images); (E) topics in carcinogenesis (review of current understanding of cancer cause and prevention). Repeatable. Pre: BIOM 551.

BIOC 514 (Alpha) Unit IV Electives in Biochemistry (1) Concurrent electives in biochemistry. (B) carbohydrate biochemistry (review and clinical correlation of important aspects of biochemistry and carbohydrate chemistry); (C) basic biochemical aspects (as applied to clinical cases); (D) introduction to magnetic resonance imaging (how the generation and processing of the magnetic signal produces strikingly clear anatomical images); (E) topics in carcinogenesis (review of current understanding of cancer cause and prevention). Repeatable. Pre: BIOM 551.

BIOC 515 (Alpha) Unit V Electives in Biochemistry (1) Concurrent electives in biochemistry. (B) carbohydrate biochemistry (review and clinical correlation of important aspects of biochemistry and carbohydrate chemistry); (D) introduction to magnetic resonance imaging (how the generation and processing of the magnetic signal produces strikingly clear anatomical images); (E) topics in carcinogenesis (review of current understanding of cancer cause and prevention). Repeatable. Pre: BIOM 551.

BIOC 525 Unit V Block Elective (V) Required elective for medical students. The objectives will be determined by contract; however, one option is a review for NBME Part I. CR/NC only. Pre: BIOM 551.

BIOC 545 Topics in Biochemistry (V) Fourth-year elective in which medical students take an in-depth study of selected topics in biochemistry. Pre: fourth-year medical student or consent.

BIOC 601L Biochemistry-Biophysics Lab (2) Basic biochemical experimental techniques; enzyme kinetics; active-site identification; amino acid sequence determination; radioimmunoassay, *in vivo* studies of nucleic acids. Pre: 441 or consent.

BIOC 624 Protein Interactions (2) Thermodynamics of protein-ligand and protein-protein interactions: protein dynamics. Pre: 441 and CHEM 351, or consent.

BIOC 643 Bioenergetics and Carbohydrates (3) Current topics on mechanism of energy production and transformation. Advanced survey of structure and metabolism of carbohydrate biochemistry. Pre: 441 or consent.

BIOC 644 Metabolic Biochemistry (3) Organization and function of metabolic pathways of proteins, heme, nucleotides, and lipids. Pre: 441 or consent.

BIOC 671 Seminar (1) Weekly discussions and reports on various subjects; current advances in biochemistry and biophysics.

BIOC 699 Directed Research (V) Pre: consent.

BIOC 700 Thesis Research (V) Research for master's thesis. Pre: consent.

BIOC 705 Special Topics in Biochemistry (V) Advanced treatment of frontiers in biochemistry. Repeatable. Pre: consent.

BIOC 710 Enzyme Regulation (2) Control of biocatalytic activity at molecular, cellular, and organismal levels. Pre: consent. (Alt. years)

BIOC 730 Phage, Plasmids, and Recombinant DNA (2) Plasmid replication, transformation, and compatibility; gene cloning, gene transfer, and genetic engineering. Pre: consent. (Alt. years)

BIOC 800 Dissertation Research (V) Research for doctoral thesis. Pre: consent.

Bioengineering (BE)

College of Tropical Agriculture and Human Resources

BE 191 Introduction to Applications in Bioengineering (V) Discussion and investigation of special topics, problems and applications of Bioengineering. Pre: consent.

BE 351 Energy Conversion and Power Units (3) Fundamentals of energy conversion for engineering and biological systems. Engineering design and performance analysis of electrical, mechanical, and hydraulic energy conversion and power transmission systems. Practical problems related to power unit selection and optimal performance. A-F only. Co-requisite: 351L. Pre: CHEM 171, MATH 241, MATH 251A and PHYS 170; or consent. **DP**

BE 351L Energy Conversion and Power Units Lab (1) (1 3-hr Lab) Laboratory experience in design and analysis of power devices and energy conversion systems. Field trips focused on field and industrial applications. A-F only. Co-requisite: 351. **DY**

BE 360 Mass and Energy Balances (3) Introduction of the principles of mass and energy conservation; development of systematic approaches to apply these principles in calculations for design and analysis of biochemical, chemical, and physical processes. Pre:

CHEM 171, PHYS 170, MATH 242, and MATH 252A. **DP**

BE 401 Modeling and Simulation of Dynamic Systems (3) Introduction to analytic solution of differential equations. Modeling and computer simulation of dynamic systems encountered in bioengineering with design applications. A-F only. Pre: BIOL 171, CHEM 171, EE 160, MATH 243, MATH 253A, and PHYS 170; or consent.

BE 405 Engineering Economics (3) Economic analysis in engineering and management decision-making, interest, depreciation, income tax, cost classification, break-even analysis, economic comparisons of alternatives, benefit-cost analysis. A-F only. Pre: ECON 120 or 130, and senior standing; or consent.

BE 413 Transport Phenomena (3) Fundamental principles and applications relating to mass, momentum, and energy transfers in biosystems and other systems for engineers and scientists. Pre: CHEM 161, PHYS 170, MATH 242 or MATH 252A; or consent. **DP**

BE 420 Sensors and Instrumentation for Biological Systems (4) Principles of common physical and chemical sensors. Interfacing sensors to different electronic circuits and instrumentation systems. Electronic detection and quantification of biomolecules (biosensors). Applied control for biological processes. Pre: EE 160 (or concurrent) and 211; or consent.

BE 421 Bioprocess Control (3) Process control in both time and Laplace domains with an introduction to the frequency domain; selection and design of appropriate control systems for bioprocesses with consideration of the impact on the total system; identification of safety concerns in designing control systems and process equipment. Pre: 360, MATH 243, or consent.

BE 431 Environmental Biotechnology (3) Environmental impact and control; the microorganism and its nutrition and growth conditions; microbial growth and substrate removal kinetics; bioreactors; biological treatment systems; biodegradation of xenobiotic organic chemicals; case studies. A-F only. Pre: consent. Spring only. **DP**

BE 437 Biosystems Unit Operations (2) Pumps and fans; size reduction; cleaning and sorting; materials handling; processing of fruits, nuts, vegetables, animals, and other bio-products. Pre: PHYS 151. **DP**

BE 440 Bioremediation: Principles and Practices (3) (2 Lec, 1 3-hr Lab) Soil environment, fate and transport of contaminants; microbial ecology, metabolism, and energy production; biodegradation of selected compounds. In situ treatment, solid-phase bioremediation, slurry-phase bioremediation, and vapor-phase biological treatment. Open to nonmajors. Repeatable once. Pre: 360, CHEM 161, PHYS 170, or consent. **DP**

BE 460 Bioreactor Design and Analysis (3) Application of mass/energy balances and reaction kinetics for the design and analysis of bioreactors for microbial, plant, and animal cell cultures. Pre: CHEM 161 and PHYS 170, or consent. **DP**

BE 481 Senior Engineering Design I (3) (1 1-hr Lec, 2 3-hr Lab) First of a two-semester course sequence that provides a major design

experience for senior students in biosystems engineering. Design process; project management; design methods; modeling and simulation; design optimization; engineering economics; engineering statistics, initiation of an open-ended design project. Pre: 351/351L, 360, or consent. **DP**

BE 482 Senior Engineering Design II (3) (1 1-hr Lec, 2 3-hr Lab) Continuation of 481. Properties of biological materials; risk and reliability; design ethics; guest lectures on engineering design by practicing engineers; extension and completion of the design project with submission of a final design report. Pre: 481 or consent. **DP**

BE 491 Bioengineering Topics (V) Study and discussion of significant topics and problems. Offered by visiting faculty and/or for extension programs. Repeatable.

BE 492 Internship (4) Integration and application of academic knowledge and critical skills emphasizing professional development. Placement with an approved cooperating supervisor/employer. Pre: consent.

BE 499 Directed Research (V) Research in the area of biosystems engineering. Pre: consent.

BE 604 Aquaculture Systems (3) Study and review of fundamental principles and mechanisms critical to understanding and operating aquaculture systems. Engineering, business, and operating analyses. Pre: CEE 320 or CHEM 151.

BE 606 Instrumentation and Measurement (3) Measurement concepts and operating principles applied to the selection and use of instruments important to scientists and engineers dealing with biological systems, including automatic data acquisition and processing. Pre: CHEM 151, MATH 241, and ME 311; or consent.

BE 610 Advanced Food Processing Technology (3) Principles and applications of new methods of food preservation. Repeatable. Pre: FSHN 401 and FSHN 403, or equivalent; or consent. (Cross-listed as FSHN 610)

BE 622 Experimental Methods in Cause-Effect Modeling (3) Factorial designs and fractional factorial designs for screening variable and response optimization. Response surface methodology. Experimental designs appropriate to building and testing multi-variable behavior relationships. Sequential experimental designs.

BE 625 Biosensor Principles and Applications (3) Elaboration of common biochemical interactions used to quantify biological molecules, and the electrical technologies used to detect them. Discussion of the desirable properties of biosensors, miniaturization and applications related to medicine, agriculture, bioproduction and environment. Pre: consent.

BE 634 Biological Treatment (3) Fundamentals of applied microbiology and biochemical reactor engineering, quantitative description of microbial growth, operational theory and design basis of aerobic, anoxic and anaerobic treatment processes. Applications for water, wastewater, air, solid wastes, and soil. A-F only. Pre: consent. Fall only. (Cross-listed as CEE 634)

BE 635 Irrigation System Design (3) Hydraulics of surface irrigation, volume balance analysis and irrigation efficiency, optimal length of run and irrigation scheduling; sprinkler

irrigation system design, distribution, and uniformity; drip irrigation system design and related problems. Pre: consent.

BE 638 Biosystems Modeling (3) Introduction to system thinking, procedures for developing system models, characteristics of important agricultural system models, computer approach to evaluation and optimization of system models. Pre: one of MATH 215, MATH 241, MATH 251A or consent. (Cross-listed as AREC 610 and GEOG 636)

BE 648 Biosystems Simulation (3) Discrete and continuous simulation models and their application in design and management of engineering and biological systems.

BE 660 Bioseparation Processes (3) Design, analysis, and scale-up of separation process that incorporates unit operations such as filtration, cell distribution, and chromatography for the purification of biological products. Pre: MATH 241 or consent. Fall only.

BE 699 Directed Research (V)

BE 700 Thesis Research (V)

BE 750 Seminar (1) Use of computer and video technology in technical presentation, review of current biosystems engineering research. Pre: consent.

Biology (BIOL)

College of Natural Sciences

Courses for Non-Science Majors

BIOL 101 Biology and Society (3) Characteristics of science, historical development of scientific concepts, and interaction of society with science illustrated by topics from biological science. Credit not given for both 101 and 123. **DB**

BIOL 101L Biology and Society Laboratory (1) (1 3-hr Lab) Lab experiments illustrating topics and methods in the biological sciences. Pre: 101 (or concurrent). **DY**

BIOL 102 General Botany (3) Growth, functions, and evolution of plants; their relations to the environment and particularly to humans and human activities. (Cross-listed as BOT 101) **DB**

BIOL 102L General Botany Laboratory (1) (1 3-hr Lab) Lab observations and experiments illustrating basic principles of plant biology. Pre: 102 (or concurrent). (Cross-listed as BOT 101L) **DY**

BIOL 103 Principles of Zoology (3) Structure, development, physiology, reproduction, evolution, behavior, and ecology of animals. (Cross-listed as ZOOL 101) **DB**

BIOL 103L Principles of Zoology Laboratory (1) (1 3-hr Lab) Laboratory to accompany 103. Pre: 103 (or concurrent). (Cross-listed as ZOOL 101L) **DY**

BIOL 123 Hawaiian Environment Science (3) Characteristics of science and interaction with society illustrated by topics in geology, astronomy, oceanography, and biology of Hawaiian Islands. Credit not given for both 123 and 101. **DB**

BIOL 123L Hawaiian Environment Science Lab (1) (1 3-hr Lab) Lab experiments illustrating topics and methods in science;

examples from Hawaiian natural history. Pre: 123 (or concurrent). **DY**

BIOL 124 Environment and Ecology (3) Biological and physical principles affecting human/environment interaction; impact of science, technology, value, and perceptions on global society and ecology; projections and options about human ecology. **DB**

BIOL 124L Environment and Ecology Lab (1) (1 3-hr Lab) Lab experiments and projects illustrating topics in human ecology. Pre: 124 (or concurrent). **DY**

BIOL 310 Environmental Issues (3) Global environmental problems in historical perspective; physical, biological, sociocultural views. Pre: one of 101, 123, or GEOG 101; or consent. **DB**

BIOL 320 The Atoll (3) Atoll as ecosystem and as human environment. Formation, structure, distribution, biota. Pre: two semesters of introductory science or consent. **DB**

BIOL 340 Genetics, Evolution and Society (3) The role of genetics in evolution, medicine, behavior, plant and animal breeding and technology; its impact on today's society. Pre: One semester of biological science at college level or consent. (Cross-listed as CMB 351) **DB**

BIOL 350 Sex Differences in the Life Cycle (3) Human sex differences, their biological basis and significance; genetic, hormonal, and behavioral determinants of sexual differentiation; biology of gender, sexuality, parenting, menopause, and aging. Pre: one semester of biological science. (Cross-listed as WS 350) **DB**

BIOL 360 Island Ecosystems (3) Characteristics of island biota; examples from Hawai'i and the Pacific. Impact of island and continental cultures; policy and ecosystem endangerment; contemporary legislation, policy, and management practices. Pre: one semester of biological science or consent. **DB**

BIOL 410 Human Role in Environmental Change (3) Human impacts through time on vegetation, animals, landforms, soils, climate, and atmosphere. Special reference to Asian/Pacific region. Implications of long-term environmental change for human habitability. Pre: one of 123, 124, or GEOG 101 and GEOG 326; or consent. (Cross-listed as GEOG 410) **DB**

BIOL 430 Seminar in the Biology of Women (3) Embryological, anatomical, and physiological development of human female; hormonal, neural, and behavioral determinants of female sexual behavior; psychobiology of pregnancy, ovariectomy, and menopause. Pre: 172, 350 or WS 350, WS 377; or consent. (Cross-listed as WS 430) **DB**

BIOL 440 Psychoactive Drug Plants (3) Taxonomy, ecology, biochemistry, distribution, cultural history, and contemporary use of mind-altering drug plants; examples from primitive, traditional, and modern societies. Pre: junior standing, one semester of biological science, and either ANTH 200 or GEOG 151; or consent. **DB**

Courses for Life Science Majors

BIOL 171 Introductory Biology (3) Introductory biology for all life science majors. Cell structure and chemistry; growth, reproduction, genetics, evolution, viruses, bacteria, and

simple eukaryotes. Pre: CHEM 151 or 161 (or concurrent) or consent. Co-requisite: 171L. **DB**

BIOL 171L Introductory Biology Lab (1) (1 3-hr Lab) Laboratory to accompany 171. Pre: CHEM 151 or 161 (or concurrent) or consent. Co-requisite: 171. **DY**

BIOL 172 Introduction to Biology II (3) Continuation of 171. Anatomy, physiology, and systematics of plants and animals; behavior; ecosystems, populations, and communities. Pre: 171/171L. Co-requisite: 172L. **DB**

BIOL 172L Introduction to Biology II Lab (1) (1 3-hr Lab) Laboratory to accompany 172. Co-requisite: 172. **DY**

BIOL 265 Ecology and Evolutionary Biology (3) Principles of ecology and evolution for life science majors stressing integrated approach and recent advance. Pre: 172/172L or consent. Co-requisite: 265L. **DB**

BIOL 265L Ecology and Evolutionary Biology Lab (1) (1 3-hr Lab) Laboratory to accompany 265. Pre: 101L, ICS 101 or consent. Co-requisite: 265. **DY**

BIOL 275 Cell and Molecular Biology (3) Integrated cell and molecular biology for life science majors. Modern advances in recombinant DNA technology. A-F only. Pre: 171/171L and CHEM 272/272L, or consent. Co-requisite: 275L. **DB**

BIOL 275L Cell and Molecular Biology Lab (1) (1 4-hr Lab) Laboratory for Cell and Molecular Biology. A-F only. Pre: 171/171L and CHEM 272/272L, or consent. Co-requisite: 275. **DY**

BIOL 299 Service Learning for Biology Majors (V) Directed participation on tutorials and related activities in public schools and approved community and UH Mānoa organizations. A-F only. Repeatable one time. Pre: 265/265L, 275/275L and consent.

BIOL 301 Biology of Marine Organisms (3) Functional, ecological, and evolutionary problems faced by life in the sea. Draws from major marine habitats and associated communities, from the deep sea to the plankton. Impacts of overfishing, marine pollution, and land development on the ecology and evolution of marine organisms. Emphasis on developing problem solving and quantitative skills. A-F only. Pre: 265,265L; 275,275L (or concurrent); and OCN 201; or consent. Co-requisite: 301L. **DB**

BIOL 301L Biology of Marine Organisms Lab (1) (1 3-hr Lab) Laboratory to accompany 301. A-F only. Pre: 265, 265L; 275, 275L (or concurrent); and OCN 201; or consent. Co-requisite: 301. **DY**

BIOL 304 Biotechnology: Science and Ethical Issues (3) Introduction to the concepts, goals, ethical issues and consequences of biotechnology using real-life case studies of cloning, DNA fingerprinting, gene therapy and genetical engineering. Pre: 171 (or concurrent) or consent. (Cross-listed as MBBE 304)

BIOL 363 Biological Field Studies (V) Biological survey, collection, and analysis techniques will be reviewed and applied through field studies. Students will be introduced to the uniqueness of the Hawaiian environment and its diversity of life. Emphasis on diversity, evolution and ecology. Pre: 265/265L or equivalent; or consent. **DB**

BIOL 375 Concepts of Genetics (3) Genetic concepts at advanced undergraduate level; genetic transmission, recombination, gene action, mutation, population and evolutionary genetics. Pre: 172/172L and 275/275L, or consent. Co-requisite: 375L. Repeatable one time. **DB**

BIOL 375L Concepts of Genetics Lab (1) (1 4-hr Lab) Experiments with a variety of organisms to illustrate principles discussed in BIOL 375. Pre: 172/172L and 275/275L, or consent. Co-requisite: 375. **DY**

BIOL 395 Internship in Biology Teaching (2) Supervised laboratory internship in the preparation and demonstration of laboratory experiments in selected laboratory courses. Repeatable one time. Pre: consent.

BIOL 401 Molecular Biotechnology (3) General principles, applications, and recent advances of the rapidly growing science of biotechnology. Topics include impact of biotechnology on medicine, animal sciences, environment, agriculture, forensics, and economic and socio-ethical issues. Pre: 275 or consent. (Cross-listed as MBBE 401) **DB**

BIOL 402 Principles of Biochemistry (4) Molecular basis of living processes in bacteria, plants, and animals; emphasis on metabolism of carbohydrates, lipids, proteins, and nucleic acids. Pre: 275, 275L, and CHEM 273; or consent. (Cross-listed as MBBE 402 and PEPS 402) **DB**

BIOL 403 Field Problems in Marine Biology (4) Integrated program of intensive lectures, laboratory experiments, and field surveys that focus on the biological processes that shape the lives of marine organisms at HIMB. A-F only. Pre: 301/301L or consent. **DB**

BIOL 404 Advanced Topics in Marine Biology (3) Current themes in marine biology and experience in scientific assessment. Repeatable two times. A-F only. Pre: 301/301L or consent. **DB**

BIOL 405 Biochemistry (4) Structure of biological molecules and molecular mechanisms of biological and physiological processes. Pre: 275 and 275L, and CHEM 273, or consent. (Cross-listed as CMB 405) **DB**

BIOL 406 Cellular Biology (3) Cell structure and function. Structure, chemistry, and functions of organelles and macromolecules. Pre: 275 and CHEM 273, or consent. **DB**

BIOL 406L Cellular Biology Laboratory (2) (2 3-hr Lab) A laboratory to accompany 406. Pre: 275L or consent. Co-requisite: 406. **DY**

BIOL 407 Molecular Biology (3) Relationship between structure and function at macromolecular level. Pre: 275 and CHEM 273; or consent. **DB**

BIOL 407L Molecular Biology Laboratory (2) (2 3-hr Lab) A laboratory to accompany 407. Pre: 275L or consent. Co-requisite: 407. Fall only. **DY**

BIOL 409 Biology Seminar (1) Study and discussion of current or significant topics and problems in biology. Open to graduating seniors in biological sciences. A-F only. Pre: consent.

BIOL 425 Wildlife and Plant Conservation (3) Principles of conservation biology and wildlife management techniques, illustrated with animal, plant, and ecosystem examples.

Examination of ethical, cultural, legal, political, and socio-economic issues impinging on conservation policy and practice. Group project and field trips. Pre: 265/265L or consent. **DB**

BIOL 441 Basic Biochemistry (4) Function and composition of biological substances and their metabolic transformation in animals, plants, microorganisms. Pre: 275/275L, CHEM 272, and CHEM 273; or consent. (Cross-listed as BIOC 441) **DB**

BIOL 499 Biological Problems (V) Directed reading and research. For seniors whose research interests are not served by MICR 499, ZOOL 499, or BOT 399. Limited to senior majors in biology (BA and BS) with a minimum cumulative GPA of 2.7 or a minimum GPA of 3.0 in biology courses.

Professional Development Courses for Science Teachers

BIOL 461 Ecology, Evolution and Conservation for High School Teachers (2) Principles of ecology, evolution and conservation for in-service teachers to learn about the integrated approach and recent advances in these areas. Pre: 171/171L, 172/172L, in-service teachers; or consent. **DB**

BIOL 462 Biogeography and Biodiversity in Hawai'i for Science Teachers (2) Principles of adaptive radiation, unique adaptations, and coevolution of Hawai'i's flora and fauna; and alien plants and animals impact on native species. Pre: 171/171L, 172/172L, or consent.

BIOL 463 Biological Field Studies for Science Teachers (2) Biological survey, collection, and analysis techniques will be reviewed and applied through field studies. Participants will be introduced to the uniqueness of the Hawaiian environment and its diversity of life. Emphasis on diversity, evolution, and ecology. A-F only. Pre: 171/171L, 172/172L, in-service teachers; or consent. **DB**

BIOL 466 Cell Biology for High School Teachers (2) Structure, function of cells, cell organelles and macromolecules. For in-service teachers to learn about the current developments in cell biology. A-F only. Pre: 171/171L, 172/172L, in-service biology teachers; or consent.

BIOL 466L Cell Biology Laboratory for High School Teachers (1) A laboratory to accompany BIOL 466. A-F only. Pre: in-service biology teachers or consent. Co-requisite: 466.

BIOL 467 Molecular Biology for High School Teachers (2) An in-depth study of gene structure and gene regulation, important cellular macromolecules and techniques used in their analyses. For in-service teachers to learn about current developments in molecular biology. A-F only. Pre: 466 or in-service biology teachers or consent.

BIOL 467L Molecular Biology Laboratory for High School Teachers (1) A laboratory to accompany BIOL 467. A-F only. Pre: in-service biology teachers or consent. Co-requisite: 467.

BIOL 501 (Alpha) Biology Workshop for Science Teachers (V) Principles taught in a conceptual and/or hands-on manner either in a laboratory setting or in the field. (B) biotechnology; (C) ecology, evolution and conservation; (D) marine biology; (F) general biology. A-F only. Repeatable. Pre: 171/171L, 172/172L, in-service teachers; or consent.

See other science professional development courses NSCI 501, 502, 503, 504, 505, 619, and 620 under the Natural Sciences (NSCI) course listing in this section of the Catalog.

Biomedical Sciences (BIOM)

School of Medicine

BIOM 499 Directed Research and Reading (V) To provide elective courses for undergraduates in the biomedical sciences specialties.

BIOM 500 Master's Plan B/C Studies (1)

BIOM 512 (Alpha) Unit II Concurrent Electives (1) Elective courses for first-year medical students. (B) histopathology; (C) medical ethics; (D) introduction to student research. CR/NC only. Pre: 551 and consent.

BIOM 513 (Alpha) Unit III Concurrent Electives (1) Elective courses for first-year medical students. (B) medical ethics; (C) introduction to student research. CR/NC only. Pre: 551 and consent.

BIOM 514 (Alpha) Unit IV Concurrent Electives (1) Elective courses for second-year medical students. (B) community health; (C) medical ethics; (D) introduction to student research. CR/NC only. Pre: 551 and consent.

BIOM 515 (Alpha) Unit V Concurrent Electives (V) Elective courses for second-year medical students. (B) community health; (C) medical ethics. CR/NC only. Pre: 551 and consent.

BIOM 525 Unit V Block Electives (V) Required electives for second-year medical students; objectives to be determined by contract. One option is a review for USMLE Step 1. CR/NC only. Pre: 551.

BIOM 531 Clerkship Assessment (1) Required comprehensive interdepartment multidisciplinary assessment program for third-year medical students. Pre: 555.

BIOM 545 (Alpha) Unit VII Interdisciplinary Electives (V) An elective for senior students to enhance skills in student-centered teaching, to review the sciences basic to the clinical problems, and to prepare students for their role as teachers during residency. CR/NC only. (B) medical education elective; (C) complementary and alternative medicine. Pre: FPCH, MED, OBN, PED, PSTY, SURG 531 or 532. Major restriction: 745.

BIOM 548 Senior Seminars (4) In-depth review of issues and subjects for fourth-year medical students to strengthen skills in art of medicine. Subjects include medical ethics, decision analysis, medical economics, and diagnostic imaging. CR/NC only.

BIOM 551 Unit I Health and Illness (13) Introductory series of problem-oriented small group tutorials for medical students stressing concepts of health and disease, supplemented by colloquia and resource sessions intended to broaden the perspectives of the Unit I health-care problems. Repeatable two times. CR/NC only.

BIOM 552 Unit II Cardiovascular, Respiratory, and Renal Problems (10) Advanced series of problem-oriented small group tutorials for medical students focusing on cardiovascular, respiratory, and renal topics, supplemented by

conferences, colloquia, labs, and resource sessions intended to broaden the perspectives of the Unit II health-care problems. Repeatable twice. CR/NC only. Pre: 551 or consent.

BIOM 553 Unit III Gastroenterology, Endocrinology, and Hematology Problems (10) Advanced series of problem-oriented small group tutorials for medical students focusing on gastroenterology, endocrinology, and hematology topics, supplemented by conferences, colloquia, labs, and resource sessions intended to broaden the perspectives of the Unit III health-care problems. Repeatable two times. CR/NC only. Pre: 551 or consent.

BIOM 554 Unit IV Locomotor System, Nervous System, Behavioral Problems (11) Advanced series of problem-oriented small group tutorials for medical students focusing on locomotor system, nervous system, and behavioral topics, supplemented by conferences, colloquia, labs, and resource sessions intended to broaden the perspectives of the Unit IV health-care problems. Repeatable two times. CR/NC only. Pre: 551 or consent.

BIOM 555 Unit V The Life Cycle (8) Advanced series of problem-oriented small group tutorials for medical students focusing on topics across the life cycle, supplemented by conferences and colloquia intended to broaden the perspectives of the Unit V health-care problems. Repeatable two times. CR/NC only. Pre: 551, 552, 553, and 554.

BIOM 566 Unit VI Topics in Health and Illness (2) A series of lecture-discussions intended to broaden the perspectives of the Unit VI experiences and health-care problems. Repeatable. CR/NC only. Pre: 551 and 555.

BIOM 571 Introduction to Clinical Skills (2) History taking and physical exam skills pertinent to the basic physical exam. CR/NC only.

BIOM 572 Unit II Clinical Skills (2) History taking and physical exam skills pertinent to the health-care problems in Unit II. CR/NC only. Pre: 571.

BIOM 573 Unit III Clinical Skills (2) History taking and physical exam skills pertinent to the health-care problems in Unit III. CR/NC only. Pre: 571.

BIOM 574 Unit IV Clinical Skills (3) History taking and physical exam skills pertinent to the health-care problems in Unit IV. CR/NC only. Pre: 551 and 571.

BIOM 575 Unit V Clinical Skills (3) History taking and physical exam skills pertinent to the health-care problems in Unit V. CR/NC only. Pre: 571. Spring only.

BIOM 581 (Alpha) Unit I Community Health (2) Field experience placing student in community settings to work with health-care professionals as they provide services to patients. (B) community health and service; (C) AHEC. CR/NC only.

BIOM 582 (Alpha) Unit II Community Health (2) Field experience placing students in community settings to work with health-care professionals as they provide services to patients; (B) community health and service; (C) AHEC. CR/NC only. Pre: 551.

BIOM 583 (Alpha) Unit III Community Health (2) Field experience placing students in community settings to work with health-care professionals as they provide services to patients;

(B) community health and service; (C) AHEC. CR/NC only. Pre: 551.

BIOM 593 Primary Care Preceptorship (3) Students will work with a primary care physician and develop an understanding of primary care practice as well as gain experience in clinical skills. Repeatable one time. CR/NC only. Pre: 551, 571, 572, and 573; or consent. Spring only.

BIOM 594 Student Research Project (3) Students will identify a research project and conduct an in-depth study that will form the focus of a formal paper and a poster presentation. Course work will be integrated into Units 1 through 4. Repeatable one time. CR/NC only. Pre: 551, 552, and 553; or consent. Fall only.

BIOM 595 Evidence-Based Medicine (2) The critical appraisal track is designed to improve the student's ability to seek and evaluate new medical knowledge. CR/NC only. Pre: 551.

BIOM 599 Research in Basic Sciences (V) An elective for medical students to work on a basic science research project under the direction of a preceptor of the biomedical sciences graduate faculty.

BIOM 640 Clinical Research Methods (2) Instruction in developing clinical research questions and creating a concise protocol that includes a literature review, study design, subject recruitment and sampling, instruments, other measures and bioinformatics, sample size, consent form, budget and timetable. A-F only. Pre: consent.

BIOM 641 Legal and Regulatory Issues and Bioethics (2) Ethical dilemmas in clinical research are identified and resolved in cases, research on human subjects regulation are discussed. Research misconduct is defined. Ethical considerations in protocol developed in the Designing Clinical Research course are resolved. A-F only.

BIOM 642 Applied Clinical Epidemiology and Biostatistics (3) Introductory epidemiologic and intermediate biostatistical methods are applied to clinical research. Epidemiologic measures such as relative risks and odds ratios and how to interpret these measures in the context of clinical studies will be addressed. Interpretation of screening tests will be included. A-F only. Pre: 640 and consent.

BIOM 643 Applied Biostatistics (3) Combines a didactic approach to multivariable regression with hands-on analysis of a clinical dataset. Regression methods for normally distributed, binary and count data, time-to-event data, model building and model evaluation are included. A-F only. Pre: 640, 642 or consent.

BIOM 644 Bioanalytical Methods (2) Introduction to disease molecular genetics: methods to identify and map candidate genes, analysis of mutations, use of markers, evaluation of gene and protein expression, collection methods, preparation of specimens, and extraction of DNA and proteins. A-F only. Pre: consent.

BIOM 645 Clinical Protocol Development (3) Provides training in proposal development. Governance structures of funding agencies; funding opportunities and decisions; review processes; NIH application and processes; reading RFAs; compliance issues; cultural sensitivity; and types of questions using databases are addressed. A-F only. Pre: consent.

BIOM 646 Clinical Research Seminar (1) Provides overview of research related to health and health disparities in Hawai'i. Seminar topics include ethnic disparities in health research, Native Hawaiian health, childhood research initiatives, fitness and obesity, social and cultural factors and ethics. Repeatable 6 times. CR/NC only. Pre: consent.

BIOM 699 Directed Reading (V) Students may register on approval of department. CR/NC only. Repeatable.

BIOM 700 Thesis Research (V) Research for master's thesis. Repeatable. CR/NC only. Pre: consent.

BIOM 800 Dissertation Research (V) Research for doctoral dissertation. Repeatable. CR/NC only. Pre: consent.

Biophysics (BIOP)

School of Medicine

Adequate preparation in chemistry (through physical chemistry), physics, and mathematics is required, and a background in biological sciences is desirable.

BIOP 499 Directed Research and Reading (V) Independent research or selected reading of current literature. Emphasizes experimental approaches in biophysics. Pre: consent.

BIOP 500 Master's Plan B/C Studies (1) Enrollment for degree completion. Pre: master's Plan B or C candidate and consent.

BIOP 602L Biochemistry-Biophysics Lab (2) Basic biophysical techniques: spectroscopic methods for macromolecular characterization; ultracentrifugation; receptor methodology; *in vitro* studies of nucleic acids. Pre: BIOC 441 or consent.

BIOP 629 Bioenergetics and Membrane Function (2) Energy transducing membrane systems; relationships of structure to function. Pre: BIOC 441, CHEM 351, or consent.

BIOP 633 Nucleic Acids (2) Chemical, physical-chemical, and metabolic principles involved in the study of primary, secondary, and tertiary structures of nucleic acids. Principles of bacterial molecular genetics, restriction, and recombination; DNA-protein interaction studies. Pre: BIOC 441, CHEM 351, or consent.

BIOP 641 Structures and Interactions (3) Proteins, nucleic acids, and membranes are examined to understand the physical and chemical bases of their structures, binding, kinetics, and interactions between biomolecular components. Pre: BIOC 441 and CHEM 351 (or concurrent); or consent.

BIOP 642 Biophysical Techniques (3) Survey of spectroscopies, light scattering, and direct visualization; study of the properties of biomolecules in solution. Pre: BIOC 441 and CHEM 351 (or concurrent), or consent. Spring only.

BIOP 699 Directed Research (V) Pre: consent.

BIOP 700 Thesis Research (V) Research for master's thesis. Pre: consent.

BIOP 705 Special Topics in Biophysics (V) Advanced treatment of frontiers in biophysics. Repeatable. Pre: consent.

BIOP 800 Dissertation Research (V) Research for doctoral thesis. Pre: consent.

BLAW

See Business Law

Botany (BOT)

College of Natural Sciences

BOT 101 General Botany (3) Growth, functions, and evolution of plants; their relations to the environment and particularly to humans and human activities. (Cross-listed as BIOL 102) **DB**

BOT 101L General Botany Lab (1) (1 3-hr Lab) Lab observations and experiments illustrating basic principles of plant biology. Pre: 101 (or concurrent). (Cross-listed as BIOL 102L) **DY**

BOT 105 Ethnobotany (3) (2 Lec, 1 Demonstration) Plants and their influence upon culture of Hawai'i and Pacific; uses of cultivated and wild plants. Co-requisite: 105L. **DS**

BOT 105L Ethnobotany Laboratory (1) (1 3-hr Lab) Laboratory exercises, experiments, and analysis in ethnobotany. A-F only. Co-requisite: 105. **DY**

BOT 135 Magical Mushrooms and Mystical Molds (3) Impact of fungi in nature and on humankind. Selected historical events in which fungi played a significant role, their activities as decomposers and pathogens, and their uses as sources for mind altering drugs in religious ceremonies and in food and beverage production in various societies. **DB**

BOT 160 Campus Plants (2) Nontechnical course emphasizing recognition of the many interesting tropical plants seen on campus; origin, status in Hawai'i, and cultural and economic uses of campus plants. **DB**

BOT 180 Plant Life in the Sea (4) (3 Lec, 1-3-hr Lab) Combined lecture-lab course to introduce common marine plants in Hawaiian coastal areas via discussion of morphology, growth, ecological functions and native/alien status. Field trips to observe plants in local habitats. **DB**

BOT 201 Plant Evolutionary Diversity (3) Significance of evolutionary trends in the plant world, including reproductive, morphological, and life history adaptations by algae, fungi, and vascular plants. Pre: 101 or college general biology. Co-requisite: 201L. **DB**

BOT 201L Plant Evolutionary Diversity Lab (1) (1 3-hr Lab) Lab exercises in the morphology and systematics of land plants, fungi, and algae. Co-requisite: 201. **DY**

BOT 311 Form and Function in Algae and Plants (3) Structural and functional adaptations of algae and plants, with an emphasis on their ecological significance in aquatic and terrestrial environments. Emphasis on bryophytes and pteridophytes. Marine macrophytes, gymnosperms and angiosperms will also be included. Both vegetative and reproductive structures considered. Pre: 201 and 201L, or consent. **DB**

BOT 350 Resource Management and Conservation in Hawai'i (3) Management of native Hawaiian organisms and terrestrial

ecosystems with particular attention to strategies, planning, research, and management actions necessary to control alien influences and promote native species. Pre: college general biology. **DB**

BOT 351 Inside Tropical Ecosystems (3) Ecology of tropical ecosystems; biodiversity and its values; energy flow, successional stages and nutrient cycles; approaches to conservation and resource management. Emphasis on Hawaiian ecosystems via field trips to study local examples. Pre: 101 or BIOL 172; or consent. **DB**

BOT 351L Inside Tropical Ecosystems Lab (1) (1 3-hr Lab) Introduction to ecological methods and common plant species of Hawaiian marine and terrestrial ecosystems. Pre: consent. Co-requisite: 351. **DY**

BOT 399 Botanical Problems (V) Individualized directed research. Intended for upper division botany majors. Repeatable six times. Pre: 101, BIOL 172, or consent.

BOT 410 Plant Anatomy (3) Structure of vascular plants; origin and differentiation of tissues; relation of structure to function. Pre: 201. Co-requisite: 410L. Recommended: 470. **DB**

BOT 410L Plant Anatomy Lab (1) (1 3-hr Lab) Lab study of plant structure. Co-requisite: 410. **DY**

BOT 430 Mycology (2) Morphology, physiology, ecology of fungi; their identification. Pre: 201, BIOL 172, or consent. **DB**

BOT 430L Mycology Lab (2) (2 3-hr Lab) Laboratory to accompany 430. Pre: 430 (or concurrent) or consent. **DY**

BOT 440 Advanced Ethnobotany (3) Advanced studies of plant uses in cultural contexts, focusing upon impacts of plant-culture interactions in development of cultures, cultivars, medicinals, ethnoecologies, ethics, and intellectual property. Pre: 105, 461 and ANTH 200; or consent. **DS**

BOT 442 Medical Ethnobotany (3) Survey and theory of plants used as medicines, cultural perspectives of herbal medicine, and the botanical/chemical basis of allopathic and naturopathic medicine. Pre: 105 or consent. Recommended: CHEM 272 or BIOC 341. **DS**

BOT 444 Ecological Ethnobotany (3) Ecological implications of cultural uses of plants. Examines the biological basis for, and ecological effects of traditional and local resource management systems. Pre: one of 101, 105, 453, ANTH 200, BIOL 101, GEOG 328; or consent. **DB**

BOT 446 Hawaiian Ethnobotany (3) (2 Lec, 1 3-hr Lab) Methods and techniques of handling and identifying plant materials used by early and modern Hawaiians for house and canoe construction, clothing, household and fishing items, medicine, and food preparation. Reading, laboratory, and fieldwork. Pre: 101 or 105, ANTH 200 or ANTH 210, and consent. **DS**

BOT 448 Cognitive Ethnobotany (3) Survey, methods and theory of the cognitive aspects of human interactions with plants and plant environments. Lecture/discussion and term paper. Pre: 440 and ANTH 414 or LING 414; or consent.

BOT 450 Natural History of Hawaiian Islands (3) (2 Lec, 1-hr Lab) Geography,

geology, climatology, biotic environment of Pacific Basin and Hawaiian Islands; endemism and evolution in terrestrial and marine biota of islands. Pre: one semester of biological sciences at college level. (Cross-listed as ZOO 450) **DB**

BOT 453 Plant Ecology and Environmental Measurements (4) (2 Lec, 2 3-hr Lab) Influence of natural environments on plant behavior (autecology). A field-oriented course to complement 454. Field trips. Should precede 454. Pre: one of 101, BIOL 172, or ZOO 101. **DB, DY**

BOT 454 Vegetation Ecology (4) (2 Lec, 2 3-hr Lab) Analysis and synthesis of plant communities and ecosystems (synecology). Field trips to develop local examples. Integrated with 453. Pre: one of 101, BIOL 172, or ZOO 101. Recommended: 453. **DB, DY**

BOT 455 Analysis of Biological Data (3) Application of computers to analysis of biological data; preparation and storage, report production, database analysis procedures, univariate and bivariate statistical analyses. Pre: BIOL 172 or consent.

BOT 456 Plant-Animal Interactions (3) Interdependence of plants and animals, emphasizing the influence of animals on plant fitness and evolution. Topics include pollination, fruit/seed dispersal, herbivory, and ant-plant mutualisms. Pre: 201/201L or BIOL 265/265L. **DB**

BOT 457 'Āina Mauliola: Hawaiian Ecosystems (3) Comprehensive analysis of traditional Hawaiian and modern resource management practices. Rigorous overview of the dominant physical and biological processes from the uplands to the oceans in Hawai'i. Pre: BOT 105, HWST 107, and junior standing; or consent. (Cross-listed as HWST 457)

BOT 458 Natural Resource Issues and Ethics (4) Overview of the history of land, resources and power in Hawai'i; players and processes influencing land and natural resources policies today explored from Native Hawaiian and other viewpoints. Extensive use of case studies. Pre: 457 or HWST 457. (Cross-listed as HWST 458)

BOT 459 Strategies in Hawaiian Resource Use (3) Analyzing diverse land and water use strategies of O'ahu, from traditional Hawaiian, scientific and economic perspectives, through classroom and on-site lectures. Topics include traditional Hawaiian methods, modern development, threatened ecosystems, eco-tourism and scientific research. A-F only. Pre: BOT/HWST 457 (or concurrent) or consent. (Cross-listed as HWST 459)

BOT 460 Hui Konohiki Internship: Applied Resource Management (3) A "hands-on" internship in an environmental or resource-management organization in Hawai'i. The experience will be broadened and supplemented by classroom lectures, discussion and analysis from traditional Hawaiian, scientific and economic perspectives. A-F only. Pre: BOT/HWST 457, BOT/HWST 458 (or co-requisite), BOT/HWST 459; or consent. Spring only. (Cross-listed as HWST 460)

BOT 461 Systematics of Vascular Plants (4) (2 Lec, 2 3-hr Lab) "Hands-on" experience with Hawai'i's unique tropical flora; emphasis on recognition and identification of vascular plant families and the principles and methodologies

that define them; evolution of biodiversity. Pre: 101 or college general biology. **DB, DY**

BOT 462 Plant Evolution (3) Major events and principles; includes the blue-green algae and fungi. Pre: 201 or BIOL 172. (Alt. years) **DB**

BOT 470 Plant Physiology (3) Integration of form and function from cellular to whole plant levels in processes from seed germination, through photosynthesis, growth, and morphogenesis, to flowering and senescence. A-F only. Pre: CHEM 152 and BIOL 171; or consent. Co-requisite: 470L. (Cross-listed as TPSS 470) **DB**

BOT 470L Principles of Plant Physiology Lab (1) (1 3-hr Lab) Principles of experimentation in plant physiology, includes individual investigations. A-F only. Pre: consent. Co-requisite: 470. (Cross-listed as TPSS 470L) **DY**

BOT 480 Algal Diversity and Evolution (4) (3 Lec, 1 3-hr Lab) Principles of algal diversity, structure, and evolution. Identification of common Hawaiian algae. Pre: one of 101, BIOL 172, MICR 351, ZOO 101, or consent. **DB, DY**

BOT 482 Adaptations of Plants to Marine Environment (3) Morphological, physiological, cellular, and molecular examples of adaptation to marine environments by marine macroalgae, phytoplankton, and sea grasses. Pre: 480. (Alt. years) **DB**

BOT 482L Adaptations of Plants to Marine Environment Lab (1) (1 3-hr Lab) Laboratory exercises emphasizing current research tools and opportunities in algal/sea grass physiological ecology. Repeatable one time. Pre: 482 (or concurrent); or consent. **DY**

BOT 500 Master's Plan B/C Studies (1)

BOT 606 Graduate Research Skills (2) (1 Lec, 1 3-hr Lab) Survey of major research areas in the botanical sciences with emphasis upon research opportunities in Hawai'i and an overview of 1) skills needed by botanical researchers including writing scientific papers and proposals, practicing ethical research procedures, and collection of specimens, and 2) equipment used by botanical researchers including computers, cameras, measuring and monitoring equipment, and global positioning systems. Lecture/discussion, laboratory. Repeatable one time. Pre: graduate standing in biological science or approval.

BOT 610 Botanical Seminar (1) Study and discussion of significant topics and problems in botany. Repeatable three times.

BOT 612 Advanced Botanical Problems (V) Investigation of any botanical problem; reading and laboratory work. Repeatable nine times. Pre: consent.

BOT 620 Perspectives in Modern Botany (2) Lectures by distinguished visiting professor on contemporary botanical topics in the lecturer's area of expertise. No more than 6 credit hours may be counted toward the MS degree requirements. Repeatable five times.

BOT 640 Quantitative Ethnobotany (3) Modern ethnobotanical field research project design, execution, data analysis, and documentation methods. Intended for students preparing to conduct field research studies. Lecture/discussion, term paper. Pre: 105 and one of 201, 461, ANTH 200, or BIOL 172.

BOT 644 Ethnoecological Methods (3) Field techniques for assessing the ecological effects of cultural uses of plants. Emphasis on documenting traditional and local patterns of plant use and measuring the effects on plant individuals, populations, communities, and landscapes. Pre: previous course work in anthropology or biology.

BOT 650 Ecology Seminar (2) Literature reviews of concepts and methods in physiological and vegetation ecology. Repeatable three times. Pre: graduate standing; consent for well-prepared undergraduates.

BOT 651 Invasion Biology (3) Theories, models, patterns, and predictive methods relating to the introduction, establishment, and spread of introduced organisms. Application of principles of invasion biology to conservation and natural resource management. Pre: one of 453, 456, 482, MICR 485 or ZOOL 439; and 462 or BIOL 375; or consent.

BOT 652 Population Biology (3) Theory and applications of population biology; behavior of population models, as revealed by analytical methods and computer simulation; application to population problems such as endangered species; discussion of classical and current literature in population biology. Pre: an upper-level ecology course and MATH 215, MATH 241, or MATH 251A; or consent. (Cross-listed as ZOOL 652)

BOT 654 Advances in Plant Ecology (2) A research-oriented course focusing on recent advances in all areas of plant ecology. Involves critical review of recent literature, independent research project, oral and written presentation of project results. Repeatable 3 times. Pre: consent.

BOT 661 Hawaiian Vascular Plants (3) (2 Lec, 1 3-hr Lab) Identification, systematics, evolution, and biogeography of native plants. Field trips. Pre: 461 or consent.

BOT 662 Advanced Systematics (4) (2 Lec, 2 3-hr Lab) Combined lecture-lab oriented course in the application of molecular protocols used in systematics and population genetics studies; emphasis on data gathering, data analysis, and presentation of results. Recommended: 669. Pre: BIOL 402, MBBE 402, PEPS 402 (or concurrent), or BIOC 441 or BIOL 441 (or concurrent); or consent. (Spring only)

BOT 663 Plant Cytotaxonomy (2) (1 Lec, 1 3-hr Lab) Aspects of cytogenetics most relevant to vascular plant taxonomy. Emphasis on student participation and mastery of cytogenetic techniques. Pre: 461 or consent. (Alt. years)

BOT 669 Molecular Systematics and Evolution (3) Molecular approaches to evolution, phylogenetics, and systematics. Basic use of chloroplast DNA, mitochondrial DNA, nuclear DNA, and electrophoresis. Phylogenetic analysis using parsimony, distance, and comparative methods. Recommended: 201. Pre: BIOL 275, BIOL 402, BIOC 441, MBBE 402, or PEPS 402; or consent.

BOT 676 Environmental Physiology Seminar (2) Environmental stress; pollution; salinity, geobotany, and other interactions between the environment and plant processes. Current literature emphasized at multidisciplinary and interdisciplinary levels. Pre: graduate status in a biological science, geosciences, etc.; consent for well-prepared undergraduates.

BOT 680 Marine Macrophytes Seminar (2) Discussion of current literature in physiological ecology, cellular and molecular adaptations to environmental factors by marine plants. Repeatable four times. Pre: 480.

BOT 690 Conservation Biology (3) Theories and concepts of ecology, evolution, and genetics for conservation of biological diversity. Topics will include restoration ecology, management planning, laws and policies, biological invasions. Pre: 453, 462, ZOOL 439, or ZOOL 480. (Cross-listed as ZOOL 690)

BOT 699 Directed Research (V) Research preliminary to thesis or dissertation research. CR/NC only. Pre: consent of graduate committee.

BOT 700 Thesis Research (V) Pre: candidacy for MS degree and approval of thesis proposal.

BOT 750 Topics in Conservation Biology (V) Advanced topics in conservation and environmental biology. Repeatable three times. A-F only. Pre: consent. (Cross-listed as ZOOL 750)

BOT 800 Dissertation Research (V) Pre: candidacy for PhD and approval of dissertation proposal.

Burmese (BURM)

College of Languages, Linguistics and Literature

BURM 101 Elementary Burmese (4) Listening, speaking, reading, writing. Structural points introduced inductively. Meets one hour daily, Monday–Friday. Lab work. **HSL**

BURM 102 Elementary Burmese (4) Continuation of 101. **HSL**

BURM 112 Intensive Elementary Burmese (4) **HSL**

BURM 201 Intermediate Burmese (4) Continuation of 102. Conversation, reading, writing. Meets one hour daily, Monday–Friday. Lab work. Pre: 102. **HSL**

BURM 202 Intermediate Burmese (4) Continuation of 201. **HSL**

BURM 212 Intensive Intermediate Burmese (10) **HSL**

BURM 303 Accelerated Third-Level Burmese (6)

Business (BUS)

College of Business Administration

BUS 099 International Exchange Study/Research (V) Study overseas in an approved international exchange or similar program. Repeatable four times. CR/NC only. Pre: consent of academic adviser.

BUS 209 Written Communication in Business (3) An interactive writing class stressing persuasive writing in the context of memos, letters, and business reports. A-F only. Pre: ACC 201 and ENG 100. Students may not earn credit for both BUS 209 and ENG 209.

BUS 250 Applied Math in Business (3) The algebra and geometry of linear, quadratic, exponential, and logarithmic functions. Mathematics of finance—annuities, perpetuities, present value. Derivatives, graphical analysis, mathematical models as applied to business.

Selected coverage of algebra, geometry, and calculus emphasizing business applications and decision making. Pre: two years high school algebra and one year plane geometry. **FS**

BUS 310 Statistical Analysis for Business Decisions (3) Problem recognition and formulation; stress on cross-disciplinary complex problem solving and communication; computer intensive. Coverage of descriptive statistics, probability and hypothesis testing with emphasis on quality, productivity, and regression analysis. Must be taken in first semester of BBA program. Pre: MATH 241 or equivalent. **DS**

BUS 311 Information Systems for Global Business Environment (3) Skills and strategies for using external information resources applied to local and global business issues; advanced skills in computer-based analytical techniques and information management; impact of information technology on business operations. Must be taken in first semester of BBA program. Pre: ICS 101 or equivalent, or consent.

BUS 312 Principles of Marketing (3) Concepts, problems, and opportunities in marketing within its competitive, political-legal, economic, social and global environments. Social responsibility and ethics. Marketing research. Consumer and business-to-business segmentation and positioning. Strategic marketing planning. Students may not earn credit for BUS 312 and TIM 304.

BUS 313 Economic and Financial Environment of Global Business (3) International trade, financial flows, and direct investment. Public and private institutions including government policies and capital markets. Emphasis on Asia Pacific issues, with attention to the cultural differences among countries. Must be taken in first year of BBA program. **DS**

BUS 314 Business Finance (3) Introduction to the theory and practice of financial management: analysis and decision making for asset management, capital budgeting, capital structure, and dividend policy. Prerequisite for all other finance courses. Pre: ACC 202 or consent.

BUS 315 Global Management and Organizational Behavior (3) Analysis of theories and concepts underlying domestic and global organizational management, including behavioral and personnel issues. Emphasis on leadership, team-work, cultural differences in the Asia Pacific region. Prerequisite to all other advanced management courses. Students may not receive credit for BUS 315 and TIM 303. Pre: PSY 100 or SOC 100.

BUS 345 Strategic Management (3) Applications of strategy to domestic and global business problems using an interdisciplinary approach. Emphasis on Asia Pacific business, assessment of risk, integration of all business core disciplines. Extensive writing expected. Pre: all core courses and graduating senior standing.

BUS 367 Business Study Abroad (V) Study abroad experience emphasizing international business issues. Course content varies depending on where the course is taught and by which professor. Course qualifies as an international business elective. Repeatable four times.

BUS 395 (Alpha) Internship (V) On-the-job experience in the business community. Term paper and meetings with faculty adviser required. (C) accounting; (D) MIS; (F) finance;

(G) management; (I) international business; (K) marketing; (M) human resource management; (R) real estate. CR/NC only. Repeatable one time. Pre: consent and RE 300 for (R) only.

BUS 477 Dynamics of Asian Finance (6) Analysis of selected key industries of Asian countries: business/economic trends, shifting product mix, technological changes, joint ventures, international competition, and productivity strategy, including contrasting management styles, worker/management relationships, and decision-making processes under different cultural settings. Industry observations conducted in Asian countries for three weeks during the summer. Pre: 6 credit hours of economics or business, PAMI participant, or consent.

BUS 500 Master's Plan B/C Studies (1) Enrollment required for degree completion. Pre: master's Plan B or C candidate and consent.

BUS 610 (Alpha) Analytical Tools for the MBA (2) Integrative course providing foundation skills in business. (B) accounting tools for the MBA; (C) statistical tools for the MBA; (D) economic tools for the MBA. 610B, 610C, and 610D must be taken concurrently. A-F only.

BUS 613 (Alpha) Organization and External Environments of Asia-Pacific Business (3) Integrative course covering, from an Asia-Pacific cross-cultural perspective, the organizational behavior in business settings along with the external and technological business environment. (B) organizational behavior; (C) external environment of Asia-Pacific business. 613B and 613C must be taken concurrently. A-F only. Pre: 610B, 610C, and 610D (or concurrent).

BUS 616 Managerial Accounting for the MBA (3) Accounting tools for business professionals focusing on decision making, planning and control; costing of business activities. A-F only. Pre: BUS 610B, 610C and 610D.

BUS 617 Managerial Finance for the MBA (3) Financial management theories and tools for business professionals; asset management; capital budgeting; capital structure and dividend policies. A-F only. Pre: BUS 610B, 610C and 610D.

BUS 618 Marketing Management (3) Concepts and issues in marketing within the global environment of business. Ethical dimensions and social responsibilities. Market research; consumer segmentation and positioning. Strategic marketing planning. A-F only. Pre: BUS 610B, 610C and 610D (or concurrent).

BUS 619 Information Technology for Management (3) Impact of information technologies on business operations and strategies in organizations. Advances in technologies (databases, multimedia, networking). Ethical and social issues. A-F only. Pre: BUS 610B, 610C and 610D (or concurrent).

BUS 660 Business Policy and Strategy (3) Integration of learning through analysis of comprehensive business problems, resolution of policy issues, and the study of competitive strategies in the international setting. Pre: all required MBA courses.

BUS 667 Business Study Abroad (V) Study abroad experience emphasizing international business issues. Course content varies depending on course of study and educational institution

selected. Course qualifies as an international business elective(s). Repeatable one time. CR/NC only. Pre: business core or permission of Assistant Dean.

BUS 677 Field Study in Asia (6) Industry observations conducted entirely in Asian countries for three and a half weeks. Pre: consent.

BUS 695 Internships (V) On-the-job experience in the business community. Project paper and meetings with faculty adviser required. A-F only. Repeatable one time. Pre: consent.

BUS 696 (Alpha) Field Studies in the Enterprise (3) Comprehensive study of (B) audit of existing organizations. Problems and solutions, or feasibility, of personally experienced organizations, as opposed to text case studies. Pre: 660.

BUS 696C Entrepreneurship (3)

BUS 699 Directed Reading and Research (V) Outline (including methodology or sources, results expected and means of measurement) must be prepared by student and approved by supervisor and chair of graduate programs before registration.

BUS 700 Thesis Research (V) Required for Plan A candidates only; 6 credit hours required, 1 of which must be taken during semester in which degree is awarded.

BUS 705 Seminar in International Management (V) Course introduces students to research and teaching at the university. Course covers topics of research including research projects currently underway by CBA faculty, advanced PhD students, distinguished visiting faculty, and research contemplated by new PhD students. Repeatable. Pre: PhD student status in international management or consent.

BUS 800 Dissertation Research (V) Repeatable. Pre: PhD student status in international management or consent.

Business Law (BLAW)

College of Business Administration

BLAW 200 Legal Environment of Business (3) Introduction to the legal environment of business operations with particular attention to business law and ethics and to principles of law relating to contracts, agency, partnerships, and corporations.

BLAW 311 Business Enterprise and Government (3) Critical study of the legal environment of business administration including competition, monopolies, mergers, securities, taxation, and regulatory agencies. Pre: 200.

BLAW 360 International Business Law (3) Overview of international and national law as it applies to international trade. Readings and case studies focus on the legal environment of selected areas in the Asia Pacific region and strategies for doing business overseas. Pre: 200.

BLAW 604 Social and Legal Aspects of Management (3) Study of the legal environment of management with particular attention to the sources, principles, and form of the law; contracts, business organizational structures, agency, and partnership.

Cambodian (CAM)

College of Languages, Linguistics and Literature

CAM 101 Introduction to Modern Khmer (4) Listening, speaking, reading, writing. Structural points introduced inductively. Meets five hours weekly; daily lab work. HSL

CAM 102 Introduction to Modern Khmer (4) Continuation of 101. HSL

CAM 105 Reading/Writing Khmer Online (2) This online course aims to develop the student's proficiency skills in reading and writing Khmer at the First Year level.

CAM 112 Intensive Elementary Khmer (10) HSL

CAM 201 Intermediate Modern Khmer (4) Continuation of 102. Conversation, reading, writing. Meets five hours weekly; daily lab work. Pre: 102. HSL

CAM 202 Intermediate Modern Khmer (4) Continuation of 201. HSL

CAM 205 Second Year Khmer Online (2) This online course aims to develop student's proficiency-based units exploring Cambodian language and culture and focusing on reading and writing at the intermediate level. Pre: 102 or 105, or consent. Fall only.

CAM 212 Intensive Intermediate Khmer (10) HSL

CAM 301 Third-Level Khmer (3) Continuation of 202. Advanced reading, writing, conversation and comprehension. Emphasis on modern contemporary texts. Computer assisted learning. Lab work. Pre: 202 or 212 or equivalent; or consent.

CAM 302 Third-Level Khmer (3) Continuation of 301. Computer assisted learning. Lab work. Pre: 301 or equivalent; or consent.

CAM 303 Accelerated Third-Level Cambodian (6)

CAM 401 Fourth-Level Khmer (3) Continuation of 302. Computer assisted learning. Advanced reading in current literature; discussion of social and cultural issues; advanced conversation and composition. Pre: 302 or equivalent; or consent.

CAM 402 Fourth-Level Khmer (3) Continuation of 401. Computer assisted learning. Pre: 401 or equivalent; or consent.

CAM 415 Khmer Language in the Media (3) This course focuses on advanced reading, writing, aural comprehension and speaking skills through the study of Khmer newspaper, radio, TV, audio/video clips and film. Repeatable one time. Pre: 402 or equivalent; or consent.

CEE

See Civil and Environmental Engineering

Cell and Molecular Biology (CMB)

School of Medicine

CMB 351 Genetics, Evolution and Society (3) The role of genetics in evolution, medicine, behavior, plant and animal breeding and technology; its impact on today's society. Pre:

One semester of biological science at college level or consent. (Cross-listed as BIOL 340) **DB**

CMB 405 Biochemistry (4) Structure of biological molecules and molecular mechanisms of biological and physiological processes. Pre: BIOL 275, BIOL 275L, and CHEM 273; or consent. (Cross-listed as BIOL 405) **DB**

CMB 411 Human Genetics (3) Principles of human genetics. Designed for pre-medical or pre-dental students or others who require a course with emphasis on human genetics. Pre: BIOL 172 and BIOL 172L, or consent. **DB**

CMB 499 Genetical Problems (V) Directed reading and research in genetics. Pre: 351 or 411.

CMB 500 Master's Plan B/C Studies (1) Enrollment for degree completion. Pre: master's Plan B or C candidate and consent.

CMB 515 Unit V Topics in Genetics (1) First-year elective course in which medical students may take an in-depth study of genetics. Pre: first-year medical student or consent.

CMB 601 Probability and Statistics in Genetics (3) Basic concepts of probability theory and statistical inferences in genetic applications. Pre: 411 or consent.

CMB 604 Evolutionary Genetics (2) Genetic changes involved in the processes of adaptation and in species formation. Pre: 411. Recommended: population and/or quantitative genetics.

CMB 606 Introduction to Neurosciences (4) An interdisciplinary overview of the central nervous system, drawn from current knowledge and research on vertebrate and invertebrate neurobiology. Pre: consent.

CMB 611 Seminar in Biomedical Sciences (1) Presentation and discussion of research topics in biomedical science. Repeatable six times. CR/NC only. Pre: graduate standing or consent. (Cross-listed as REPR 611)

CMB 618 Cytogenetics (3) (2 Lec, 1 1-hr Lab) Correlation of genetic and cytological phenomena. Pre: 411.

CMB 621 Cell Molecular Biology I (4) Molecular approaches to cell structure and function emphasizing cells in multicellular plants and animals. Pre: graduate standing, BIOC 441 or BIOL 402, MBBE 402, or PEPS 402, and BIOL 406; or consent. Recommended: CHEM 351.

CMB 622 Cell Molecular Biology II (4) Molecular approaches to cell structure and function emphasizing cells in multicellular plants and animals. Pre: one of 621, BIOC 441 or BIOL 402, MBBE 402, or PEPS 402, and BIOL 406; or consent.

CMB 625 Advanced Topics in Genetics (2) Advanced treatment of frontiers in genetics. Pre: graduate standing in genetics or consent.

CMB 626 Ethics in Biomedical Research (2) Course topics include responsible data management, recording, reporting, misconduct and scientific fraud, conflicts of interest, critical use of animals and human issues and subjects in research, genetic screening, stem cell and gene therapy and patenting.

CMB 631 Research Rotations (3) Individualized research project in three laboratories of CMB faculty with a written report on each project. Faculty laboratories will be selected by consultation with student's graduate committee

and individual faculty. Pre: 621 (or concurrent), 622 (or concurrent), or consent.

CMB 650 Population Genetics (3) Mathematical, observational, experimental results on effects of mutation, selection, and systems of mating on distribution of genes. Analysis of non-experimental populations. Pre: 601 or consent.

CMB 654 (Alpha) Genetics Seminar (1) Research and topical literature reports in genetics. May be repeated. (B) molecular genetics; (C) molecular biology of cancer; (D) human genetics; (E) cytogenetics; (F) evolutionary genetics; (G) molecular biology of the cell; (H) drosophila genetics; (I) population/statistical genetics; (J) developmental genetics; (K) insect molecular biology; (M) genetics and molecular biology of fungi. Pre: graduate standing in genetics or consent.

CMB 671 (Alpha) Techniques in Genetics (V) Laboratory training in procedures used in diagnosis of genetic diseases, cytogenetics, immunogenetics, and dermatoglyphics. Pre: graduate standing in genetics or consent.

CMB 672 Techniques in Genetics (3) Continuation of 671.

CMB 680 Molecular Genetics (3) Structure of proteins and nucleic acid to genetic fine structure, mutagenesis, transfer of genetic information, and control of development. Pre: 411 and BIOC 441 or BIOL 441; or consent.

CMB 699 Directed Research (V) Pre: graduate standing and consent.

CMB 700 Thesis Research (V) Research for master's thesis. Pre: acceptance of thesis topic.

CMB 701 Human Polymorphisms (3) (2 Lec, 1 1-hr Lab) Phenotypic, serum protein, isozymic, and other polymorphisms; pharmacogenetics, theory of polymorphisms; disease associations; evidence for and against selection; significance. Pre: 650 or consent.

CMB 702 Immunogenetics (3) (2 Lec, 1 1-hr Lab) Immunological and genetic analysis of antigenic variation; cellular and soluble antigenic systems; transplantation; genetic control of immune response. Pre: 680 or consent.

CMB 705 Special Topics in Neurosciences (V) Advanced topics in neuroscience, from basic neurobiology to clinical neurology and psychiatry. Emphasis on current investigations at the cellular or molecular level. Pre: consent.

CMB 712 Quantitative Methods in Human Family Genetic Analysis (3) (2 Lec, 1 1-hr Lab) Lecture and laboratory sessions covering probability models and statistical methods used in genetic analysis of human family data. Pre: a course in genetics and calculus, or consent.

CMB 750 Human Population Genetics (3) Comprehensive treatment of the genetics of human populations with emphasis on population structure. Pre: 650.

CMB 800 Dissertation Research (V) Pre: acceptance of dissertation topic.

Chamorro (CHAM)

College of Languages, Linguistics and Literature

CHAM 101 Elementary Chamorro (4) Introduction to Chamorro, emphasis on

listening and speaking, language structure. Meets five hours weekly. Lab work. **HSL**

CHAM 102 Elementary Chamorro (4) Listening, speaking, reading, and writing skills; emphasis on oral and reading proficiency. Meets five hours weekly. Lab work. Pre: 101 or equivalent, or consent. **HSL**

CHAM 201 Intermediate Chamorro (4) Continuation of 102. Emphasis on comprehension and language production (speaking). Meets five hours weekly. Lab work. Pre: 102 or equivalent, or consent. **HSL**

CHAM 202 Intermediate Chamorro (4) Continuation of 201. Emphasis on comprehension and language production. Lab work. Pre: 201 or equivalent, or consent. **HSL**

Chemistry (CHEM)

College of Natural Sciences

Credit allowed for only one of CHEM 151, 161, 171, or 181A.

CHEM 151 Elementary Survey of Chemistry (3) Nonrigorous but adequate background in fundamentals. Preparation for technical training in life sciences. **DP**

CHEM 151L Elementary Survey of Chemistry Lab (1) (1 3-hr Lab) Experiments introducing laboratory techniques and illustrating chemical principles. Pre: 151 (or concurrent). **DY**

CHEM 152 Survey of Organic and Bioorganic Chemistry (3) Structure, nomenclature, properties, reactions of organic compounds emphasizing those of practical importance in related fields. Pre: 151, 162, or 171. (Cross-listed as ENBI 152) **DP**

CHEM 152L Survey of Organic and Bioorganic Chemistry Lab (1) (1 3-hr Lab) Techniques of preparation, purification, identification of organic compounds. Pre: 151L, 162L, or 171L; and 152 (or concurrent). **DY**

CHEM 161 General Chemistry I (3) Basic principles of chemistry. Introduction to electronic structure, chemical bonding, solutions, kinetics, equilibrium, phases, and energy changes in matter. Pre: placement exam. **DP**

CHEM 161L General Chemistry Lab I (1) (1 3-hr Lab) Laboratory experiments introducing techniques and fundamental principles of chemistry. Pre: 161 (or concurrent). **DY**

CHEM 162 General Chemistry II (3) Continuation of 161. Basic principles of chemistry. Introduction to electronic structure, chemical bonding, solutions, kinetics, equilibrium, phases, and energy changes in matter. Pre: 161. **DP**

CHEM 162L General Chemistry Lab II (1) (1 3-hr Lab) Laboratory experiments introducing techniques and fundamental principles of chemistry. Pre: 161L and 162 (or concurrent). **DY**

CHEM 171 Principles of Chemistry (4) Principles, theories, elementary analytical methods of chemistry. Intended for physical science majors and engineers. Pre: high school chemistry and MATH 215 or MATH 241 or MATH 251. **DP**

- CHEM 171L Principles of Chemistry Lab (1)** (1 3-hr Lab) Laboratory experiments illustrating fundamental principles of chemistry. Pre: 171 (or concurrent). **DY**
- CHEM 181A Honors General Chemistry (4)** Rigorous, in-depth introduction to chemical principles with emphasis on experimental and applied aspects of modern chemistry. Pre: high school chemistry and MATH 215 or MATH 241 or MATH 251. Fall only. **DP**
- CHEM 181L Honors General Chemistry Laboratory (1)** (1 3-hr Lab) Laboratory experiments illustrating chemical principles involving advanced techniques and modern instrumentation. Co-requisite: 181A. **DY**
- CHEM 272 Organic Chemistry I (3)** Molecular structure, stereochemistry, spectroscopy, mechanisms, reactions, and synthesis of organic compounds. Pre: 162 or 171. **DP**
- CHEM 272L Organic Chemistry I Lab (2)** (1 5-hr Lab) Techniques, synthesis and qualitative analysis, applications of spectroscopy. Pre: 162L or 171L, and 272 (or concurrent). **DY**
- CHEM 273 Organic Chemistry II (3)** Continuation of 272. Molecular structure, stereochemistry, spectroscopy, mechanisms, reactions, and synthesis of organic compounds. Pre: 272. **DP**
- CHEM 273L Organic Chemistry II Lab (1)** (1 4-hr Lab) Techniques, synthesis and qualitative analysis, applications of spectroscopy. Pre: 272L and 273 (or concurrent). **DY**
- CHEM 274 Principles of Analytical Chemistry (3)** Selected methods and principles, e.g., phase equilibria, ionic equilibria, electrode equilibria, separations, spectroscopy, automation, and process control. Pre: 272 and MATH 216 or MATH 242 or MATH 252A. **DP**
- CHEM 274L Principles of Analytical Chemistry Lab (2)** (2 3-hr Lab) Phase separations, chromatography, titrimetry, spectrophotometry, etc. Pre: 274 (or concurrent). **DY**
- CHEM 333 Instrumental Analysis (3)** Methodology and instrumentation; UV/VIS spectrometry, emission and absorption spectrometry, HPLC, potentiometry, voltammetry, and coulometry. Pre: 274/274L and 351 (or concurrent). **DP**
- CHEM 333L Instrumental Analysis Lab (2)** (2 3-hr Lab) Principles and applications of instrumentation for electrochemical and spectrometric analysis. Pre: 333 (or concurrent). **DY**
- CHEM 351 Physical Chemistry I (3)** Principles and theories; physico-chemical procedures. Pre: 162L or 171L or 181L, MATH 243 or MATH 253, and PHYS 272 and PHYS 272L. **DP**
- CHEM 352 Physical Chemistry II (3)** Continuation of 351. Pre: 351. **DP**
- CHEM 352L Physico-Chemical Measurements (2)** (2 3-hr Lab) Modern laboratory techniques. Pre: 333L, 352 (or concurrent), and ICS 101 or equivalent. **DY**
- CHEM 380 Professional Ethics for Chemists (1)** Discussion of contemporary ethical issues in chemistry using case studies and additional examples from the media. CR/NC only. Pre: 352L (or concurrent) or consent. Spring only. **DP**
- CHEM 399 Directed Reading or Research (V)** Pre: chemistry major, and minimum cumulative GPA of 2.7 or minimum GPA of 3.0 in chemistry. Repeatable.
- CHEM 422 Intermediate Inorganic Chemistry (3)** Classification, description, fundamental theory. Pre: 352 (or concurrent). **DP**
- CHEM 423 Synthesis: Inorganic Compounds (2)** (2 Lec, 2 3-hr Lab) Advanced lab techniques and descriptive chemistry of inorganic compounds. A-F only. Pre: 422 (or concurrent). Co-requisite: 443. **DP**
- CHEM 443 Synthesis: Organic Compounds (2)** (2 Lec, 2 3-hr Lab) Advanced contemporary synthetic techniques. A-F only. Pre: 273/273L. Co-requisite: 423. **DP**
- CHEM 445 (Alpha) Intermediate Organic Chemistry (3)** (B) synthesis; (C) mechanisms; (D) natural products. Pre: 273. **DP**
- CHEM 601 Theory of Chemical Bonding (3)** Application of quantum mechanics and symmetry principles to descriptions of chemical bonding. Pre: 352.
- CHEM 602 Chemical Applications of Spectroscopy (V)** Introduction to magnetic resonance, infrared, UV, and visible spectroscopy, emphasizing applications to organic and inorganic chemistry. Three topics each semester—1 credit hour per topic. Repeatable in different topics. Pre: 601.
- CHEM 621 Advanced Inorganic Synthesis (3)** A survey of the periodic table examining the characteristics and reactivities of representative elements. A-F only. Pre: 423 or consent.
- CHEM 622 Organometallic and Main Group Chemistry (3)** Types and reactions of metal carbon bonds, catalysis, compounds and reactions of main group elements. Pre: 352 and 422.
- CHEM 623 Coordination Chemistry (3)** Survey of Lewis acids and bases, coordination numbers, geometries, stereochemistry, ligand field theory, formation constants, and bio-inorganic chemistry. Pre: 601 and 602 (or concurrent).
- CHEM 631 Methods of Instrumental Analysis (V)** Theory, instrumentation, applications. Three areas each semester—1 credit hour per area. Repeatable in different areas. Pre: 333.
- CHEM 633 Molecular Spectroscopy (3)** Experimental and theoretical principles underlying x-ray spectroscopy. Pre: 601.
- CHEM 641 Organic Structure Determination (3)** Interpretation of chemical and physical (primarily spectral) data in the identification of organic compounds. Pre: consent.
- CHEM 642 Organic Synthesis (3)** Modern synthetic methods with emphasis on the design and execution of multi-step sequences. Pre: 445 or consent.
- CHEM 643 Physical Organic Chemistry (3)** Theory of molecular structure, stereochemistry, and reaction mechanisms. Pre: 445 and 601, or consent.
- CHEM 651 Chemical Thermodynamics and Statistical Mechanics (3)** Includes statistical thermodynamics, with application to chemical systems. Pre: 352.
- CHEM 652 Chemical Kinetics and Reaction Dynamics (3)** Kinetics and chemical reaction dynamics of elementary reactions relevant to combustion processes, astrochemistry, chemical vapor deposition and planetary sciences. Pre: 352 or PHYS 430 and PHYS 480. Spring only.
- CHEM 653 Quantum Chemistry (3)** Rigorous introduction to quantum mechanics, including operator formalism, matrix formation, group theory, and perturbation theory; introduction to the electronic structure of atoms and molecules. Pre: 352 and MATH 244 or MATH 253A.
- CHEM 657 Astrochemistry - A Molecular Approach (3)** Formation of astrophysically important molecules and their precursors in the interstellar medium and in our solar system: first principles and latest trends. Pre: consent. Fall only. (Cross-listed as ASTR 657 and GG 657)
- CHEM 658 Crystallography (3)** Crystal symmetry. Elementary x-ray physics. Diffraction theory and its application to crystal and molecular structure determination. Pre: 352 and MATH 244 or MATH 253A.
- CHEM 691 (Alpha) Inorganic Chemistry Seminar (1)** Current topics in (D) analytic-inorganic; (E) organic; (Z) inorganic chemistry. Repeatable. Pre: graduate standing.
- CHEM 692 (Alpha) Inorganic Chemistry Seminar (1)** Continuation of 691. Current topics in: (D) analytic-physical; (E) organic; (Z) inorganic chemistry. Repeatable. Pre: graduate standing.
- CHEM 699 Directed Research (V)** Repeatable. Pre: consent.
- CHEM 700 Thesis Research (V)** Pre: candidacy for MS degree and consent of thesis chair.
- CHEM 721 Special Topics: Inorganic Chemistry (V)** Theory and applications. Repeatable. Pre: consent.
- CHEM 731 Special Topics: Analytical Chemistry (V)** Theory and applications. Repeatable. Pre: consent.
- CHEM 741 Special Topics: Organic Chemistry (V)** Theory and applications. Repeatable. Pre: consent.
- CHEM 751 Special Topics: Physical Chemistry (V)** Theory and applications. Repeatable. Pre: consent.
- CHEM 753 Advanced Quantum Chemistry (3)** Continuation of 653. Application of quantum mechanics to atoms and molecules, solid surfaces, with emphasis on electronic structure and chemical bond formation. Pre: 653.
- CHEM 800 Dissertation Research (V)** Pre: candidacy for PhD degree and consent of dissertation chair.

Chinese (CHN)

College of Languages, Linguistics and Literature

All students taking language courses in this program for the first time must take a regularly scheduled placement test; those with no background must come to the Department of East Asian Languages and Literatures for a brief interview. A grade of C or better in the prerequisite courses is required for continuation.

CHN 101 Elementary Mandarin (4) Listening, speaking, reading, writing, grammar. Meets one hour daily, Monday–Friday, plus daily lab work. Pre: placement test. **HSL**

CHN 102 Elementary Mandarin (4) Continuation of 101. Pre: 101 or consent. **HSL**

CHN 103 Accelerated Elementary Mandarin (8) Content of 101 and 102 covered in one semester. Meets two hours daily, Monday–Friday, plus daily lab work. Pre: placement test. **HSL**

CHN 111 Elementary Conversational Mandarin I (3) The purpose of this course is to offer the student the basic knowledge (listening, speaking and grammar) of spoken Mandarin, and to train the student to handle some familiar everyday topics. **HSL**

CHN 112 Elementary Conversational Mandarin II (3) Continuation of 111. Pre: 111 or consent. **HSL**

CHN 131 Beginning Cantonese (4) Introduction to standard dialect of Canton, emphasis on conversational skills. Meets one hour daily, Monday–Friday, plus daily lab work. Pre: consent. **HSL**

CHN 132 Beginning Cantonese (4) Continuation of 131. Pre: 131 or consent. **HSL**

CHN 201 Intermediate Mandarin (4) Continuation of 101 and 102. Meets one hour daily, Monday–Friday, plus daily lab work. Pre: 102, or 103, or consent. **HSL**

CHN 202 Intermediate Mandarin (4) Continuation of 201. Pre: 201 or consent. **HSL**

CHN 204 Accelerated Intermediate Mandarin (8) Content of 201 and 202 covered in one semester. Meets two hours daily, Monday–Friday, plus daily lab work. Pre: 102, or 103, or consent. **HSL**

CHN 211 Intermediate Conversational Mandarin I (3) The purpose of this course is to further strengthen the student's listening and speaking skills in Mandarin. The student is expected to be able to comprehend and produce speech at the paragraph level. Pre: 112 or consent. **HSL**

CHN 212 Intermediate Conversational Mandarin II (3) Continuation of 211. Pre: 211 or consent. **HSL**

CHN 231 Intermediate Cantonese (3) Continuation of 131 and 132; meets three hours a week, plus lab work. Pre: 132 or consent. **HSL**

CHN 232 Intermediate Cantonese (3) Continuation of 231. Pre: 231 or consent. **HSL**

CHN 251 Reading and Writing Chinese (I) (3) This is the first half of a year-long course designed for those who can handle daily conversation in Mandarin Chinese but cannot read or write in the language. Pre: 212 or consent.

CHN 252 Reading and Writing Chinese (II) (3) This is the second half of a year-long course designed for those who can handle daily conversation in Mandarin Chinese but cannot read or write in the language. Pre: 251 or consent.

CHN 301 Third-Level Mandarin (4) Vocabulary building and extended mastery of sentence structures of modern Chinese through reading and related conversation. Meets one hour

daily, Monday–Friday, plus lab work. Pre: 202, or 204, or consent.

CHN 302 Third-Level Mandarin (4) Continuation of 301. Pre: 301 or consent.

CHN 303 Accelerated Third-Level Mandarin (8) Content of 301 and 302 covered in one semester. Meets two hours daily, Monday–Friday, plus daily lab work. Pre: 202, or 204, or consent.

CHN 311 Mandarin Conversation (3) Systematic practice on everyday topics of conversation. Lab work. Pre: 202, or 204, or consent.

CHN 312 Mandarin Conversation (3) Continuation of 311. Pre: 202, or 204, or consent.

CHN 313 Mandarin for Cantonese Speakers (3) For Cantonese speakers only. Competence in spoken Mandarin through comparison of Cantonese and Mandarin (pronunciation, romanization, vocabulary, idioms, and syntax). Translation from Cantonese to Mandarin. CR/NC only. Pre: placement test.

CHN 314 Mandarin for Cantonese Speakers (3) Continuation of 313. Pre: placement test.

CHN 315 Spoken Taiwanese I (3) The purpose of this course is to offer the student the basic knowledge (listening, speaking, romanization and grammar) of spoken Taiwanese and to train the student to handle some familiar everyday topics. Pre: 202 or consent.

CHN 316 Spoken Taiwanese II (3) Continuation of 315. Pre: 315 or consent.

CHN 319 Chinese Dialect Studies (V) Advanced Cantonese or other Chinese dialects. Repeatable one time. CR/NC for native Chinese speakers. Pre: consent.

CHN 331 Advanced Chinese Listening and Writing (3) Web-based training in Chinese listening, reading, and writing to develop skills at the advanced level. Course activities combine independent work with communicative activities on the course web site. Features language exchange with native speakers. Repeatable one time. Pre: 301 (or concurrent) or consent.

CHN 332 Advanced Chinese Reading and Writing (3) Web-based training in Chinese reading and writing to develop skills at the advanced level. Course activities combine independent work with communicative activities on the course web site. Ideal for in-service professionals seeking language development and maintenance. Repeatable one time. Pre: 301 (or concurrent) or consent.

CHN 399 Directed Third-Level Reading (V) For those who need special assistance, e.g., in reading texts in their area of specialization or at a pace more rapid than those of standard courses. CR/NC only. Repeatable. Pre: consent.

CHN 401 Fourth-Level Mandarin (4) Extensive reading in academic topics. Meets one hour daily, Monday–Friday, plus lab work. Pre: 302 or consent.

CHN 402 Fourth-Level Mandarin (4) Continuation of 401. Pre: 401 or consent.

CHN 404 Accelerated Fourth-Level Mandarin (8) Content of 401 and 402 covered in one semester. Meets two hours daily, Monday–Friday, plus lab work. Pre: 302, or 303, or consent.

CHN 411 Advanced Mandarin Conversation (3) Systematic practice on academic topics of conversation. Lab work. Pre: 302 or consent.

CHN 412 Advanced Mandarin Conversation (3) Continuation of 411. Pre: 411 or consent.

CHN 413 Advanced Mandarin for Cantonese Speakers (3) Systematic practice for spontaneity, accuracy, and depth in conversation. CR/NC only. Pre: 313 and 314, or consent.

CHN 414 Advanced Mandarin for Cantonese Speakers (3) Continuation of 413. Pre: 413 or consent.

CHN 415 Advanced Taiwanese I (3) Course will strengthen foundation in Taiwanese, enabling the student to further acquire and develop language skills in listening, speaking, reading and writing in Church Romanization. Pre: 316 or consent. Fall only.

CHN 416 Advanced Taiwanese II (3) Continuation of 415. Pre: 415 or consent.

CHN 421 (Alpha) Chinese Translation (3) Training in techniques; theory of translation. (B) Chinese–English; (C) English–Chinese. Pre: 402 or consent.

CHN 431 Readings in Taiwanese: Nonfiction (3) For students who have the speaking ability in Taiwanese and a good knowledge of Han characters. Reading Taiwanese nonfiction texts. Pre: 316 or consent.

CHN 432 Readings in Taiwanese: Fiction (3) For students who have the speaking ability in Taiwanese and a good knowledge of Han characters. Course content consists of reading Taiwanese fiction texts. Pre: 316 or consent.

CHN 451 Structure of Chinese (3) Introduction to phonology and morphology of Mandarin Chinese; some discussion of usage and linguistic geography. Pre: 202, or 204, or consent. **DH**

CHN 452 Structure of Chinese (3) Introduction to syntax and semantics of Mandarin Chinese; some discussion of usage and linguistic geography. Pre: 202, or 204, or consent. **DH**

CHN 453 Study of Chinese Characters (3) Origin, structure, and evolution. Pre: 402, 461, or consent. (Alt. years)

CHN 454 Study of Chinese Characters (3) Continuation of 453. Pre: 453 or consent. (Alt. years)

CHN 455 Chinese Pragmatics and Discourse (3) Introduction to pragmatics and discourse analysis of Mandarin Chinese; some discussion of usage and linguistic geography. Pre: 202, 204 or consent. **DS**

CHN 461 Introduction to Classical Chinese (3) Analysis of basic structural patterns through selected readings in various texts. Pre: 302 or consent.

CHN 462 Introduction to Classical Chinese (3) Continuation of 461. Pre: 461 or consent.

CHN 470 Language and Culture of China (3) Extensive exposure—chiefly through tape recordings, classroom conversation, and outside readings—to history, culture, and institutions. Pre: 401 or consent. **DH**

CHN 485 Selected Readings in Chinese (3) Readings in modern Chinese in various disciplines. Pre: 402 or consent.

CHN 486 Selected Readings in Chinese (3) Continuation of 485. Pre: 485 or consent.

CHN 487 (Alpha) Readings in 20th Century Chinese Literature (3) Representative works of writers from People's Republic of China, Taiwan, and Hong Kong. (B) short stories; (C) poetry and drama; (D) novels and essays. Repeatable two times. Pre: 402 and 485 or 486; or consent. **DL**

CHN 491 Oral Fluency Through Chinese Films (3) This course is designed for students to further their listening and speaking skills through discussion of Chinese films. Students will be required to watch the films before class. Pre: 402 or consent. **DH**

CHN 499 Directed Fourth-Level Reading (V) For those who need special assistance, e.g., in reading texts in area of specialization or at a pace more rapid than those of standard courses. CR/NC only. Repeatable. Primarily for graduate students from other departments. Pre: consent.

CHN 610 (Alpha) Chinese Poetry (3) Critical study of major traditional Chinese poetic forms. (B) ancient (to 5th century); Pre: 462, 483, or consent (C) medieval (5th–10th century); Pre: 610B or consent (D) late imperial (10th–19th century); Pre: 610C or consent.

CHN 611 (Alpha) 20th Century Chinese Literary Studies (3) Critical discussion of scholarship in the field and formal analysis of literature from the People's Republic of China, Taiwan, and Hong Kong. (B) short stories; (C) poetry and drama; (D) novels and essays. Repeatable one time. Pre: 402 and 487; or consent.

CHN 612 Traditional Chinese Fiction (3) Formal and thematic analysis of short stories, historical romances, and novels. Repeatable one time with consent. Pre: 402 or consent.

CHN 613 (Alpha) Traditional Chinese Drama (3) Major plays. (B) Yuan period (1271–1368); (C) Ming and Ching periods (1368–1911). Pre: 402 or consent.

CHN 631 (Alpha) History of Chinese Language (3) (B) phonology; (C) syntax. Pre: 451, LING 421, or consent for (B); 452 or consent for (C).

CHN 633 Chinese Dialects (3) Synchronic description of a Chinese dialect other than Cantonese and Mandarin; contrastive and comparative studies with Mandarin. Repeatable one time with consent. Pre: 451 and 452, or consent.

CHN 634 Chinese Syntax and Semantics (3) Verbal categories, aspects, focus devices, resultative and directional compounds, coverbial constructions. Interaction between syntax and semantics. Pre: 452 or consent.

CHN 641 Contrastive Analysis of Mandarin and English (3) Pre: 451.

CHN 642 Contrastive Analysis of Mandarin and English (3) Pre: 452.

CHN 643 Methods in Teaching Chinese as Second Language (3) Problems in language learning and teaching. Practice in preparing and presenting lessons with materials based on comparative linguistic analysis. Materials, teaching aids, test construction. Pre: 451 and 452, or consent.

CHN 650 (Alpha) Topics in Chinese Language (3) Extensive studies of selected topics (B) teaching and testing; specific problems in teaching Chinese including characters and

cultural elements; proficiency and communicative ability; (C) cognitive grammar. Pre: 451 and 452, or consent. (C) A-F only. Once a year.

CHN 661 Advanced Classical Chinese (3) Pre: 461, 462, and consent.

CHN 662 Advanced Classical Chinese (3) Pre: 661 and consent.

CHN 699 Directed Research (V) CR/NC only. Pre: consent.

CHN 750 (Alpha) Research Seminar in Chinese Language (3) (B) teaching methods; Pre: 643 (C) structure; Pre: 452 (D) classical grammar; Pre: 452 (E) sociolinguistics; Pre: 451.

CHN 753 (Alpha) Research Seminar in Chinese Literature (3) Study of authors, a genre, a period, or a problem. (M) modern; (T) traditional. A-F only for (M). Pre: 611, WS 613, WS 615, or WS 650; or consent for (M); 612, 613, or consent for (T). ((M) Cross-listed as WS 753 (Alpha))

CIS

See Communication and Information Sciences

Civil and Environmental Engineering (CEE)

College of Engineering

Preference in registration is given to declared engineering majors. Please consult the current Schedule of Classes for confirmed offerings each semester.

CEE 123 Computer-Aided Design and Drafting (1) Introductory course in engineering drawing employing the computer. Topics include theory of projections, multiview representations, sectional views, auxiliary views, and dimensioning. Restricted to majors.

CEE 211 Surveying I (2) Basic principles of plane surveying, including reference planes and surfaces, use of instruments for distance and angular measurements, traverse adjustment, heights, measurement theory, computer applications, and topographic surveying. A-F only. Pre: computer programming, MATH 243 or 252A, and civil engineering major; or consent.

CEE 211L Surveying I Lab (1) Distance, angle, and height measurements. Traverse design, measurements and computations. A-F only. Pre: 211 (or concurrent).

CEE 270 Applied Mechanics I (3) Forces, resultants, and equilibrium; analysis of trusses, frames, and machines; centroids, moments of inertia; friction. A-F only. Pre: grade of C or better in PHYS 170, and MATH 243 or MATH 252A (or concurrent); or consent. **DP**

CEE 271 Applied Mechanics II (3) Dynamics of particles and rigid bodies; force, acceleration, impulse-momentum, work-energy. A-F only. Pre: grade of C (not C minus) or better in 270, and MATH 244 or MATH 253 (or concurrent); or consent. **DP**

CEE 305 Applied Probability and Statistics (3) Description of sample data; correlation and regression; probability and statistical distributions; estimations of population parameters;

fittings distributions to histograms; hypothesis testing. A-F only. Pre: MATH 244 or MATH 253A; or consent.

CEE 320 Fluid Mechanics Fundamentals (4) (3 Lec, 1 2-hr Lab) Compressible and incompressible fluid properties; fluid statics; kinematics, energy and momentum considerations in steady flows; application of steady flow concepts to various fluid processes. A-F only. Pre: 271 and PHYS 310. **DP**

CEE 330 Environmental Engineering (4) (3 Lec, 1 2-hr Lab) Parameters and indices of environmental quality; materials balances; chemical kinetics; ideal reactor models; water and air pollution control; solid and hazardous waste management. A-F only. Pre: 305 (or concurrent), 320 or consent. **DP**

CEE 355 Geotechnical Engineering I (4) (3 Lec, 1 3-hr Lab) Introduction to geotechnical engineering: soil characterization, index properties, seepage and flow in soil, stresses in soils, compressibility, consolidation, shear strength. A-F only. Pre: 320, 370, or consent. **DP**

CEE 361 Fundamentals of Transportation (3) Transportation modes: land, air, water, pipelines. Tourist, urban transportation. Geometric design, human factors, vehicular flow models, capacity analysis. Overview: traffic impact, air quality, parking studies. A-F only. Pre: 271. **DP**

CEE 370 Mechanics of Materials (3) Elastic stress-strain relation and behavior of members under flexural, torsional, and axial loading. A-F only. Pre: 271 (or concurrent); MATH 244 or MATH 253 (or concurrent); CEE 370L (or concurrent); or consent. **DP**

CEE 370L Mechanics of Materials Lab (1) Tension, compression, and torsion of bars, and bending of beams. A-F only. Pre: 370 (or concurrent). **DY**

CEE 375 Construction Materials (3) (2 Lec, 1 2-hr Lab) Introduction to the crystalline and molecular structure of materials. Properties of metals, concrete, concrete admixtures, asphalt, wood, and other materials commonly used in construction. A-F only. Pre: 305 and 370. **DP**

CEE 381 Structural Analysis (3) Analysis of statically determinate plane and space trusses and frames; deflections; introduction to matrix methods; computer applications. A-F only. Pre: 370. **DP**

CEE 405 Engineering Economics (3) Economic analysis in engineering and management decision-making, interest, depreciation, income tax, cost classification, break-even analysis, economic comparisons of alternatives, benefit-cost analysis. A-F only. Pre: ECON 120 or 130, and senior standing; or consent. (Cross-listed as BE 405)

CEE 412 Surveying II (3) (2 Lec, 1 3-hr Lab) Advanced course in surveying; project design and specifications; measurements, errors, and adjustments; land surveying; state plane coordinate systems; modern instrumentation. A-F only. Pre: 211 or consent.

CEE 417 Computer Methods in Engineering Systems (3) Numerical solutions of engineering problems using digital computers. Regression analysis; numerical differentiation and integration; solutions of algebraic, transcendental, and differential equations; and analysis of large

structural systems. Pre: computer programming and senior standing.

CEE 421 Engineering Hydraulics (3)

Analytical and computer solutions of engineering hydraulics problems. Hydraulics of closed conduits and open channels, well hydraulics, introduction to coastal hydraulics. Pre: 320. **DP**

CEE 422 Environmental Fluid Mechanics (3)

Introduction to basic concepts of pollutant transport phenomenon through theoretical modeling, lab and field experiments and observations. Specific topics include mass balance, jets and plumes, mixing and transport in rivers, reservoirs, groundwater and estuaries; non point course pollution. A-F only. Pre: 320, and MATH 244 or MATH 253A or equivalent; or consent. (Alt. years) **DP**

CEE 424 Applied Hydrology (3) Introduction to occurrence, distribution, circulation of surface and groundwater through precipitation, streamflow, evaporation, transpiration, infiltration. Engineering applications. A-F only. Pre: 305 and 320; or consent. **DP**

CEE 431 Water and Wastewater Engineering (3) Hydrologic fundamentals of water demand and supply; water and wastewater distribution; collection systems; quality characterization; analytical methods for water quality management. Pre: 330. **DP**

CEE 433 Water Quality Laboratory (3) (2 3-hr Lab) Analysis and characterization of typical water and wastewater samples for organic and inorganic constituents such as alkalinity, hardness, solids, biochemical oxygen demand, nitrogen and phosphorous species, coliform bacteria, and trace organic chemicals. Relevance of these measurements to water and wastewater regulations and engineering design. A-F grading only. Repeatable. Pre: 330 and either CHEM 171 and 171L or CHEM 161, 161L and 162, and senior standing.

CEE 451 Soil and Site Improvement (3)

Methods of improving engineering properties of soils and sites through use of mechanical stabilization, soil admixtures, pre-consolidation, deep densification, and earth reinforcement. A-F only. Pre: 355 or consent.

CEE 455 Geotechnical Engineering II (3)

Continuation of 355 introducing geotechnical engineering topics including: field exploration, lateral earth pressures, bearing capacity theory, slope stability theory, use of geosynthetics, earthquake effects and ground modification. A-F only. Pre: 355 or consent. **DP**

CEE 461 Pavement Engineering (3) (2 Lec, 1 3-hr Lab)

Design principles of flexible and rigid pavements; HMA mixture design, equipment and construction; and application of life cycle cost analysis (LCCA) in pavement engineering. The course includes laboratory sessions for aggregate testing and Superpave mix design. A-F only. Pre: 355, 361 and 375 or consent.

CEE 462 Traffic Engineering (3) Design/analysis of signalized, unsignalized intersections, urban networks. Traffic impact studies; analysis steps and applications. Design/redesign options. Parking studies: demand, alternative designs (lot layouts). Pre: 361 or consent.

CEE 464 Urban and Regional Transportation Planning (3) Application of travel demand forecasting models to transportation planning.

Evaluation and decision-making, microcomputer applications. Term projects. Pre: 361 or consent. **DP**

CEE 465 Traffic Network Simulation (3)

Introduction to computer simulation; Monte Carlo techniques; application of traffic simulation packages. Term project required. Pre: 361 or consent. **DP**

CEE 471 Construction Methods (3)

Methods of construction, primarily buildings. Construction types: light and heavy wood; steel; plain, reinforced, and prestressed concrete; masonry. Foundations; associated details of frames, walls, roofs, floors, openings, finishes. Disasters, failures, and their causes. Industrialization of the building process. Pre: 375.

CEE 472 Construction Management (3)

Introductory treatment of the management of construction. Construction supervision, contract documents, estimating and bidding, organization, planning and scheduling, administration, business methods, safety, and labor. Pre: 375 or consent.

CEE 473 Construction Equipment and Methods (3)

Methods and equipment used on horizontal/heavy engineering projects. Available equipment, their production, and how they are used to excavate, move, process, and place the earth. Pre: 375, senior standing or consent.

CEE 474 Construction Estimating and Bidding (3)

Estimating science; techniques of estimating quantities and pricing of work for construction contracting; classification of costs, analysis of plans and specifications for estimating; computerized estimating; cash flow, bidding strategy, preparation and submission. A-F only. Pre: 375 or consent.

CEE 476 Construction Planning and Scheduling (3)

To teach the theory and the practice of planning, scheduling, and reporting a construction project through the use of bar chart and CPM. The course format to include lectures, text, outside speakers, site visits, discussions, case study, and computers. Pre: 375 or consent.

CEE 482 Indeterminate Structures (3)

Analysis of statically indeterminate beams, frames, trusses, arches, and space structures by classical and matrix methods; computer applications. Pre: 381. **DP**

CEE 483 Field Experience (1)

CEE 485 Reinforced Concrete Design (4) (3 Lec, 1 2-hr Lab) Behavior and design of reinforced concrete beams, one-way slabs and columns. Laboratory section includes design and hands-on manufacturing and testing of reinforced concrete members. Pre: 381 or consent. **DP**

CEE 486 Structural Steel Design (3)

Basic properties of steel; behavior and design of steel beams, columns, and connections; introduction to rigid frames. Pre: 381. (Alt. years) **DP**

CEE 490 Senior Design Project (3)

Design problem involving several areas of civil engineering and requiring a team approach for a solution. A-F only. Pre: senior standing in CEE. Spring only.

CEE 491 (Alpha) Special Topics in Civil and Environmental Engineering (3)

Course will reflect special interests of visiting and/or permanent faculty. Pre: junior or senior standing, and consent.

CEE 492 (Alpha) Special Topics in Civil and Environmental Engineering (3) Course will reflect special interests of visiting and/or permanent faculty. Pre: junior or senior standing, and consent.

CEE 499 Special Problems (V)

Individual investigation in civil and environmental engineering topics as approved by instructor. Pre: senior standing, and minimum cumulative GPA of 2.7 or minimum GPA of 3.0 in engineering.

CEE 500 Master's Plan B/C Studies (1)

CEE 602 Construction Scheduling and Claims (3) Precedence networks, CPM, float, updating, resource leveling, least cost scheduling, scheduling case studies, computerized scheduling, exclusion reports, sorting, term project; contract law, types of claims, proving claims, delay claims, impact of changes, Eichleay Formula, acceleration, overtime, stacking, crowding, efficiency losses, contract interpretation, Leonard Study, Kuiper model, labor escalation, claims case studies, term paper. A-F only. Pre: graduate standing in civil and environmental engineering and consent.

CEE 604 Cost Engineering and Quality Control (3)

Study and applications of cost/schedule control systems criteria, earned value analysis, probabilistic cost estimating, construction risk management, construction quality control, and operations research in construction. Pre: 472 and 474; or consent.

CEE 606 Analysis of Construction Operations (3)

A study for design of construction processes. Topics include line of balance, queueing, delay models, and process simulation with CYCLONE. Pre: 472 or consent. (Alt. years)

CEE 610 Construction Productivity Improvement (3)

Design of productivity and safety improvement programs in a construction company. Time-lapse techniques, crew balancing, work sampling, data gathering and analysis, worker fatigue, quality circles, motivation and project leadership, construction automation. Pre: 472 and one other senior-level construction course, or consent.

CEE 614 Negotiation and Alternative Dispute Resolution (V)

Lawyers negotiate settlements in almost all their cases. This class presents a "hands-on," skill-building approach to the newest ideas, as well as centuries-old techniques, about the skill lawyers will use most often in their private practice - negotiation. The class also examines the rapidly developing field of alternative dispute resolution (ADR), including mediation, facilitation, arbitration, and court-annexed ADR. (Cross-listed as LAW 508)

CEE 617 Introduction to FDM and FEM (3)

Introduction to Finite Difference and Finite Element Method in Engineering; Numerical Differentiation and Integration. Ordinary Differential Equation, Partial Differential Equation, Finite Difference Method, and Finite Element Method. A-F only. Pre: 417 or consent. Fall only.

CEE 620 Reforming Public Organizations (3)

Explores the possibilities for reducing the most difficult aspects of the bureaucratic form in public organizations while increasing effectiveness and accountability. Repeatable one time. A-F only. Fall only. (Cross-listed as PUBA 620)

CEE 622 Fluid Mechanics (3) Theory of fluid dynamics in differential form, covering equation of motion, vortex generation, flow in rotating frame, potential theory, laminar flow, and introduction to turbulence.

CEE 623 Groundwater Modeling (3) Introduction to the finite-difference method; steady-state and transient groundwater flow in saturated and unsaturated media; applications to groundwater recharge and aquifer evaluation. A-F only. Pre: 627 or consent. Fall only. (Cross-listed as GG 655)

CEE 625 Hydrologic Processes in Soils (3) Hydrologic properties in soils and the processes involved in water infiltration drainage and solute transport. Emphasis on key parameters required for modeling. Pre: 424 or consent. Fall only. (Cross-listed as NREM 660)

CEE 626 Surface Water Hydrology (3) Quantitative studies of water cycle and relationships among principal hydrologic elements: precipitation, runoff, infiltration, and evapotranspiration, with emphasis on engineering and management of surface waters. Pre: consent. (Alt. years)

CEE 627 Groundwater Hydrology (3) Groundwater occurrence, movement, quality, and resource evaluation, development, and management. Emphasis on saltwater encroachment, well evaluation, aquifer protection, recharge with wastewater, and Hawai'i type hydrology. Pre: 424 or consent.

CEE 630 Water Resources Systems Planning and Management (3) Planning and management of multiobjective water resources systems to achieve a sustainable development. Using EIA/EIS for project alternatives evaluation to attend optimal balance in economic development and environmental quality enhancement. A-F only. Pre: students with a B.S. degree or senior standing in civil and environmental engineering; or consent.

CEE 633 Physical and Chemical Treatment (3) Introduction to physical and chemical processes for water and wastewater treatment: Review of momentum and mass transfer, chemical reactions, colloidal chemistry, coagulation and flocculation, granular filtration, sedimentation, carbon adsorption, gas transfer, disinfection and oxidation. A-F only. Pre: 431 or consent.

CEE 634 Biological Treatment (3) Fundamentals of applied microbiology and biochemical reactor engineering, quantitative description of microbial growth, operational theory and design basis of aerobic, anoxic and anaerobic treatment processes. Applications for water, wastewater, air, solid wastes, and soil. A-F only. Pre: consent. Fall only. (Cross-listed as BE 634)

CEE 635 Environmental Chemistry (3) Basic concepts of chemistry as related to the environment, with more emphasis on water. Topics include chemical kinetics, equilibrium, acid-base, precipitation and dissolution redox reactions, sorption, organic chemicals in the environment. Pre: consent.

CEE 636 Water Quality Biology (3) Fundamental microbiology involved in environmental engineering processes and research with special emphasis on mixed culture systems, biochemistry, and microbiological aspects of water supply protection and wastewater treatment. Pre: consent.

CEE 637 Sanitary Engineering Laboratory (3) (2 Lec, 1 3-hr Lab) Laboratory studies of chemical, physical, and biological treatment of water and wastewater for development of design criteria and system operation. Pre: 635 or consent.

CEE 641 Marine Disposal of Wastewaters (3) Practical material on outfalls: Alternatives; planning; dangers; data collection; predesign studies; design and bidding; dredging and construction; costs; commissioning; inspection, operation and maintenance; repairs and replacement; review of selected world outfalls. Pre: consent. (Alt. years)

CEE 643 Hazardous Waste Remediation (3) Introduces the national problems dealing with the contamination of groundwater and presents remedial measures. Such measures include pump and treat (PAT) technology, in-situ bioremediation, soil vapor extraction, air sparging, electrokinetics, hydraulic fracturing, reactive walls, and phytoremediation. A-F only. Pre: 627 or consent. Co-requisite: 634 and 635. Fall only.

CEE 644 Water Quality Modeling (3) Mathematical formulation of pollutant transport and mixing in the water environment. Kinetics formulation and parameter identification, model calibration and verification. Design projects. Pre: 422 and 431, or consent.

CEE 648 Membrane Separations (3) Applications of membrane separations to desalination, water reclamation, brine disposal and ultrapure water systems. Discussion of reverse osmosis, nanofiltration, ultrafiltration, microfiltration, electrodialysis and ion exchange technologies. Membrane fouling and concentration polarization from both practical and theoretical standpoints. Membrane Bio-Reactors. A-F only. Pre: 635 or consent.

CEE 650 Seepage, Drainage, and Dewatering (3) Theory of seepage, field and laboratory methods of measurement; graphical and numerical methods; design of drainage structures; construction dewatering. A-F only. Pre: 455 or consent. Fall only. (Alt. years)

CEE 651 Deep Foundations (3) Analysis and design of deep foundations; driven piles and drilled shafts. A-F only. Pre: 455 or consent. (Alt. years)

CEE 652 Experimental Soil Mechanics (3) Advanced laboratory testing and application of analyses using test data for solution of a hypothetical geotechnical project. A-F only. Pre: 455 or consent. (Alt. years)

CEE 653 Advanced Soil Mechanics (3) Soil continuum mechanics principles; elastic, plastic and cam clay soil behavior; critical state and strength; interpretation of laboratory test results. A-F only. Pre: 455 or consent. (Alt. years)

CEE 654 Geotech Seismic Engineering (3) Soil and site response to dynamic loading, earthquake ground motions; stress waves and soil shear moduli; soil liquefaction theory, evaluation, analyses, and preventative design. A-F only. Pre: 455 or consent. (Alt. years)

CEE 655 Slope and Earth Structures (3) Classification of landslides and triggering mechanisms; field investigation procedures; limit equilibrium slope stability methods; numerical techniques; seepage and dynamic considerations; case studies. A-F only. Pre: 455 or consent. (Alt. years)

CEE 656 Marine Geotechnics (3) Principles of geotechnical engineering applied to marine environments; marine geology; surveying and sampling methods; seabed sediment types, properties, and behavior; scour, erosion, and sediment transport; coastal and offshore foundations; seafloor stability; dredging and waste disposal. A-F only. Pre: 455 or consent. (Alt. years)

CEE 657 Designing with Geosynthetics (3) An overview of geotechnical uses of geosynthetics, including product descriptions, applications, design methods, and case studies. A-F only. Pre: 455 or consent. (Alt. years)

CEE 658 Earth Pressures (3) Estimation of lateral earth pressures; analysis and design of retaining walls and excavation support systems. A-F only. Pre: 455 or consent. (Alt. years)

CEE 660 Transportation Evaluation and Logistics (3) Evaluation of transportation alternatives. Efficiency and effectiveness analysis. Logistics, network problems, exact and heuristic solution algorithms. Computer applications on evaluations and logistics. A-F only. Pre: 462 or 464; or consent.

CEE 661 Intelligent Transportation Systems (3) Definition, technologies and their attributes. Analysis and implementation based on FHWA's User Services. Automated incident detection algorithms. Machine vision applications to traffic engineering. A-F only. Pre: 462 or 464.

CEE 664 Advanced Transportation Modeling and Statistics (3) Demand modeling, discrete choice and activity-based modeling. Demand forecasting by simulation. Transportation surveys and sampling methods. Application of cluster, factor, regression, logistic and ARIMA analyses to transportation. A-F only. Pre: 305 and 464, or consent.

CEE 665 Pavement Design and Rehabilitation (3) Course in pavement engineering with emphasis given to understanding fundamental issues such as historical development of pavement design, approaches used for design of new pavements and overlays, understanding of construction issues and their effects on pavement performance, and various design factors: environmental, loading and materials characterization. Introduction of pavement management systems. A-F only. Pre: 355 and 375; or consent.

CEE 671 Continuum Mechanics (3) Cartesian tensors in mechanics; coordinate transformations; analysis of stress and strain; principal values, invariants, equilibrium and compatibility equations; constitutive relations; field equations. Problems in elasticity. Pre: 370 or ME 371, or consent. (Cross-listed as ME 671)

CEE 675 Structural Dynamics I (3) Response of single and multi degree-of-freedom systems due to dynamic forces. Direct integration of equations of motion. Response spectrum analysis. Application to earthquake loading. Systems with distributed mass and elasticity. A-F only. Pre: consent.

CEE 676 Structural Dynamics II (3) Elastic and inelastic response of structures due to earthquakes. Seismic design criteria. Code design procedures. Advanced topics in time- and frequency-domain dynamic analysis of structures. A-F only. Pre: 675.

CEE 680 Advanced Mechanics of Materials (3) Advanced topics in structural mechanics

including three-dimensional stress and strain, torsion of non-circular sections, curved beams, fracture mechanics, beams on elastic foundation, and plates. Pre: 485 and 486; or consent.

CEE 681 Theory of Modern Structural Analysis (3) Fundamentals of modern structural analysis theory, with emphasis on frame structures. Virtual work. Member stiffness/flexibility. Matrix formulation of stiffness and flexibility methods. Computer modeling issues. Pre: 482 or consent.

CEE 682 Numerical Methods in Engineering (3) Numerical methods commonly used to solve civil and environmental engineering problems: linear and nonlinear equations, numerical integration, integration of ODEs, eigensolvers. Emphasis on implementation. Pre: programming background and graduate standing.

CEE 683 Advanced Reinforced Concrete Design (3) Slender columns; biaxial bending; combined shear and torsion. Building lateral load resisting frame analysis and design—shearwalls, rigid frames. Floor system analysis and design—flat slabs, joist systems. Computer applications. A-F only. Pre: 485.

CEE 685 Advanced Structural Steel Design (3) Load and resistance factored design (LRFD); steel building modeling and analysis; moment-resisting frames; bracing systems; beam-columns; moment connections; composite construction; and plate girders. A-F only. Pre: 482 (or concurrent) and 486; or consent.

CEE 686 Finite Elements in Structures (3) Finite element method in structural engineering. Extension of structural theory. Virtual work. One-, two-, and three-dimensional elements; axisymmetric elements; plate bending. Application to linear problems. Pre: 671 (or concurrent) and 681, or consent.

CEE 687 Prestressed Concrete (3) Behavior of prestressed concrete members, including prestress losses. Analysis and design of prestressed beams, slabs, and composite sections. Anchorage zone design; continuous systems. Pre: 485.

CEE 688 Concrete Technology (3) Mixture proportioning with and without pozzolanic materials, aggregate testing, concrete testing, effects of admixtures, admixture side effects, nondestructive testing, and durability issues. A-F only. Pre: 485 or consent.

CEE 689 Mechanics and Design of Composite Materials (3) Basic concepts of mechanics and design of composite materials utilizing continuous fibers embedded in polymeric matrices (Fiber Reinforced Polymers (FRP)) and short fibers randomly oriented in cementitious matrices (Fiber Reinforced Cement Composites). Repeatable two times. A-F only. Pre: 370 or consent. (Alt. years)

CEE 690 GIS in Civil and Environmental Engineering (3) Fundamental principles and components of vector-based GIS applications including spatial models, topological overlays, planar coordinate systems and projections, non-spatial (attribute) data models, and spatial analysis; hands-on exercises; individual term project required. A-F only. Pre: consent.

CEE 691 Seminar in Civil and Environmental Engineering (1) Discussions and reports on literature, research, developments and activities in civil engineering. Two units required of all

graduate students. Repeatable two times. CR/NC only. Pre: graduate standing or consent.

CEE 695 Plan B Master's Project (3) Independent study for students working on a Plan B Master's Project. A grade of Satisfactory (S) is assigned when the project is satisfactorily completed. CR/NC only. Pre: graduate standing in CEE or consent.

CEE 696 Selected Topics in Civil and Environmental Engineering (3) Highly specialized topics in structures, soils, hydraulics, sanitary, water resources, applied mechanics, transportation. Repeatable. Pre: consent.

CEE 699 Directed Readings or Research (V) Pre: consent.

CEE 700 Thesis Research (V) Research for master's thesis.

CEE 800 Dissertation Research (V) Research for doctoral dissertation. Pre: candidacy for PhD in civil engineering.

Colleges of Arts and Sciences (CAS)

See Arts and Sciences

Communication (COM)

College of Social Sciences

COM 201 Introduction to Communication (3) An overview of communication emphasizing the interpersonal, intercultural, organizational and international communication, management, multimedia, mass media, and telecommunication perspectives. **DS**

COM 320 Organizational Communication (3) Communication in formal organizational contexts; research and theory of communication within organizations; role of communication in organizational effectiveness. Pre: 201 or consent. **DS**

COM 330 Telecommunication Concepts and Technologies (3) Basic electronics and concepts of telecommunication; orientation to telecom technologies including television, radio, cable, video disc, and telecom/computer convergence. Pre: 201 or consent.

COM 331 Fundamentals of Visual Media (3) Orientation to techniques of production. Emphasis on history, language, and theory of the creative process and application to video productions and multimedia. Pre: 201 or consent.

COM 335 Mass Communication (3) Introduction to mass communication theory. Emphasis placed on theoretical approaches to societal effects of media, human communication, and research traditions in mass communication. Pre: 201 or consent. **DS**

COM 337 Introduction to Multimedia (3) Combined lecture-lab course providing an orientation to, and examination of, procedures and techniques of multimedia. Emphasis on new media literacy, human-computer interaction, and basic design of electronic multimedia. Pre: 201 or consent.

COM 340 Intercultural Communication (3) Problems and opportunities of communication in a variety of intercultural contexts. Focus on

theory, research, and managing intercultural effectiveness. Pre: 201 or consent. **DS**

COM 350 Communication in Interpersonal Relationships (3) Theory and practice of interpersonal communication from a social science perspective. Pre: 201 or consent. **DS**

COM 401 Introduction to Communication Research Methods (3) Exploration of quantitative and qualitative research methods commonly used in communication studies. Practical experience will be offered. Pre: 201 or consent. **DS**

COM 420 Communication in Multicultural Organizations (3) Cultural diversity in multicultural and multinational organizations is examined regarding communication-related aspects of working life. Pre: 320 and 340, or consent. **DS**

COM 423 Applied Organizational Communication (3) Principles of organizational communication applied in organizational assessment, intervention, training, and development. Pre: 201 and junior standing, or consent.

COM 431 Video Production Lab I (3) Production of studio and remote video programming including news/information, instructional/educational, and dramatic formats. Lighting, sound, blocking, and equipment competency. Pre: 331 or consent.

COM 432 Telecommunication Services (3) Understanding human information needs as they relate to telecommunication services developed from new technologies. Pre: 330 or consent.

COM 433 Video Scriptwriting (3) Application of communication theory to creating and revising commercial and dramatic script material for video production. Pre: 331 or consent.

COM 434 Video Production Lab II (3) Creating, scripting, and producing complex programs. Media aesthetics and professional production, preparation, and execution are emphasized. Pre: 331 and 431, or consent.

COM 436 Media Effects (3) Social, political, economic, and cultural effects of broadcast media are examined to understand their impact on human behavior. Pre: 201 and junior standing, or consent.

COM 437 Interactive Multimedia Design and Development (3) The design, development, and evaluation of interactive computer-based multimedia communication. The course emphasizes authoring and production of such multimedia elements as full-motion images, audio, graphics, etc. Pre: 337 or consent.

COM 438 International Telecommunication (3) Development of international telecommunication with emphasis on political theory, social purposes, legal regulation, and competition among nations. Pre: 330 or consent. **DS**

COM 440 Intercultural Training and Intervention (3) This course describes programs designed to prepare, support, and train individuals, groups, and communities for effective intercultural interaction at home and abroad. Pre: 340 or consent.

COM 441 Communication Policy and Planning (3) Alternative models in policy and planning that bring about or inhibit social, economic, and technical development in

communication systems and their environments. Pre: 201 and junior standing, or consent. **DS**

COM 442 Communication in the Pacific Hemisphere (3) Comparative communication processes, development communication, technology, knowledge and skill transfer, and regional communication issues in the Pacific hemisphere. Pre: 201 and junior standing, or consent.

COM 444 Communication and Gender (3) Theories, myths, and the missing links in gendered communication. Application of established and emerging theories of gender and communication to interpersonal, organizational, intercultural, and mass communication. Pre: 201 and junior standing, or consent. **DS**

COM 451 Communication and Law (3) Role of communication in the legal process; impact of law on communication processes. Pre: 201 and junior standing, or consent. (Cross-listed as JOUR 365) **DS**

COM 452 Building Communication Theory (3) Major theories of communication in terms of requirements for a theory, theory development, associated research, and application. Pre: 201 and junior standing, or consent. **DS**

COM 453 Ethnography of Communication (3) The interactional basis of communication in normal everyday living. Students analyze face-to-face and mediated communication using ethnographic methods. Pre: 201 and junior standing, or consent. **DS**

COM 454 Communication Campaigns (3) Communication strategies and research methods that lead to effective campaign programs. Focus on political, marketing, and public communication campaigns. Pre: 201 and junior standing, or consent. **DS**

COM 459 Special Topics (3) Topics of interest to faculty and students; taught by regular and visiting faculty. Repeatable on different topics to 6 credit hours. Pre: 201 and junior standing, or consent.

COM 460 Media Ethics (3) Ethics and social responsibility for media professionals. Application of ethical theories and principles to case studies and research projects. Pre: any 300-level course in communication or journalism. (Cross-listed as JOUR 460)

COM 475 Global Communication (3) Problems and opportunities of communication in a variety of international contexts. Focus on commerce, diplomacy, and mass communication. Pre: 201 or consent. (Cross-listed as JOUR 475) **DS**

COM 480 Communication Seminar (3) Application of theoretic and methodological criteria to researchable questions. Topics will vary. Pre: 201 and senior standing, or consent.

COM 490 Senior Thesis Project (3) Completion of the thesis project appropriate to the selected area of concentration within the context of a seminar. Pre: 201 and senior standing, or consent.

COM 495 Communication Internship (V) Analysis of communication processes under faculty supervision through participation in the operations of an organization. Repeatable up to 3 credit hours. Pre: 201 and junior standing, or consent.

COM 499 Special Problems (V) Independent study of selected topics under faculty supervi-

sion. Repeatable up to 3 credit hours. Pre: 201 and junior standing, or consent.

COM 500 Master's Plan B/C Studies (1)

COM 611 Communication Theories (3) Systematic study of major theories of communication and current status of communication research.

COM 612 Communication Research Methods (3) Introduction to the major steps in the research process. Emphasis on the methodological approaches to making choices among alternatives at each step of a research cycle.

COM 623 Organizational Communication (3) Communication theory/research applied to formal organizations; assessments of strengths and weaknesses of organizational communications systems. Pre: 611 (or concurrent) or consent. (Cross-listed as PUBA 623)

COM 624 Organizational Communication Training (3) Designing and implementing training systems in organizations; conducting training programs; evaluating training program effectiveness. Pre: 612 (or concurrent) or consent.

COM 633 Telecommunication Architectures (3) Telecommunication structures, processes, and networks as an area of research and study in the social sciences. Pre: 611 (or concurrent) or consent.

COM 634 Telecommunication Services (3) Systematic study from a social science perspective of current and emerging teleservices. Attention to user needs and impact, and to tele-service design. Pre: 612 (or concurrent) or consent.

COM 643 Intercultural Communication (3) Problems and opportunities of intercultural communication from theory and research, consulting and training, and policy and program perspectives. Pre: 611 (or concurrent) or consent.

COM 644 International Communication (3) Principles and practices of international communication from the perspectives of relevant theories, focusing on problems in an information age. Pre: 612 (or concurrent) or consent.

COM 645 Mass Communications (3) An introduction to major mass media theories, research trends and literature. Pre: 611 (or concurrent) or consent.

COM 646 Intercultural Training/Intervention (3) This course describes programs designed to prepare, support, and train individuals, groups, and communities for effective intercultural interaction at home and abroad. A-F only. Pre: 643 or consent.

COM 650 Communication Policy (3) Examination of the formation and implementation of communication policy in world, national, and local arenas. Key concepts; role in development. Pre: 611 (or concurrent) or consent.

COM 660 Communication Planning (3) Processes and methods of planning appropriate to the communication sector, including cultural, information, and media industries and organizations. Pre: 611 (or concurrent) or consent.

COM 691 Communication Topics (3) Coverage in depth of some area of theory and research. Repeatable one time. Pre: 611 and 612, or consent.

COM 692 General Research Seminar (3) Application of theoretic and methodological criteria to a researchable question. Pre: 611 and 612, or consent.

COM 695 Communication Practicum (V) Supervised work experience, study of an organization, and career planning. Required of Plan B students in the main communication program. Repeatable. CR/NC only. Pre: 611 and 612, or consent.

COM 699 Directed Reading and Research (V) Individual reading and/or research. Pre: consent.

COM 700 Thesis Research (V)

Communication and Information Sciences (CIS)

College of Social Sciences

CIS 699 Directed Reading and/or Research (V)

CIS 701 Communication/Information Theories of Society (3) A critical review of major theoretical and empirical traditions in communication and information sciences. Focus on European, American, Third World, and applied research. Pre: consent.

CIS 702 Communication/Information Technologies (3) Technological concepts underlying data communications; information processing and computers; communication channels and networks, information storage and retrieval, and computer hardware and software. Pre: consent.

CIS 703 Communication/Information Research Methods (3) Current research methodologies in decision sciences, computer science, library science, and communication. Emphasis on methodologies suitable for interdisciplinary analysis. Pre: consent.

CIS 720 Interdisciplinary Seminar in Communication and Information Sciences (1) Exploration of relationships between disciplines in social sciences, science and technology, and humanities. Faculty and student presentations. CR/NC only. Pre: consent.

CIS 799 Directed Reading and/or Research (V) Individualized program of directed reading and/or research outside the scope of regularly titled courses. Pre: consent. Plan must include goals and rationale.

CIS 800 Dissertation Research (V)

Counseling and Guidance (EDCG)

College of Education

EDEP 429 is a prerequisite for the graduate program in counseling and guidance and is to be completed before advancement to candidacy.

EDCG 402 Guidance and Classroom Management (3) Guidance principles applied to classroom management for teachers. Pre: consent.

EDCG 470 Ethnic Groups and Education in Hawai'i (3) Identity and learning within and among Hawai'i ethnic groups; study of prejudice and inter-ethnic hostilities as these impact education and teaching. Pre: consent. (Cross-listed as EDEF 470) **DS**

EDCG 500 Master's Plan B/C Studies (1) Enrollment for degree completion. Pre: master's Plan B or C candidate and consent.

EDCG 581 (Alpha) Educational Workshop in Guidance (1) For counselors, counseling and guidance teachers, and other personnel to develop new approaches, attitudes, and ideas pertaining to the role and function of counseling and guidance in school, community, and state. (B) elementary school; (C) middle school; (D) high school; (E) college; (F) rehabilitation; (G) career; (H) evaluation and assessment; (I) personal development; (J) research methods; (K) guidance technique for classroom teachers; (M) counseling and social issues; (N) counselor as consultant; (O) program development; (P) geriatric; (Q) adult development. Repeatable with different content. CR/NC only.

EDCG 582 (Alpha) Educational Workshop in Guidance (2) For counselors, counseling and guidance teachers, and other personnel to develop new approaches, attitudes, and ideas pertaining to the role and function of counseling and guidance in school, community, and state. (B) elementary school; (C) middle school; (D) high school; (E) college; (F) rehabilitation; (G) career; (H) evaluation and assessment; (I) personal development; (J) research methods; (K) guidance technique for classroom teacher; (M) counseling and social issues; (N) counselor as consultant; (O) program development; (P) geriatric; (Q) adult development. Repeatable with different content. CR/NC only.

EDCG 583 (Alpha) Educational Workshop in Guidance (3) For counselors, counseling and guidance teachers and other personnel to develop new approaches, attitudes, and ideas pertaining to the role and function of counseling and guidance in school, community, and state. (B) elementary school; (C) middle school; (D) high school; (E) college; (F) rehabilitation; (G) career; (H) evaluation and assessment; (I) personal development; (J) research methods; (K) guidance technique for classroom teacher; (M) counseling and social issues; (N) counselor as consultant; (O) program development; (P) geriatric; (Q) adult development. Repeatable with different content. CR/NC only.

EDCG 603 Introduction to Practicum (3) Pre-practicum training for supervised experiences in school, community, and human service organizations. Focus on the counseling relationship. Includes a specialty observation-participation field experience. Pre: consent.

EDCG 604 Career Development and Vocational Counseling (3) Theory and practice in career development and vocational counseling with individuals and groups; utilization of educational, vocational, and social resources in career counseling. Pre: consent.

EDCG 605 Human Growth and Development—Life Span (3) Life span perspective on psychological, social, and physical development. Major theories and related research on human development; applications in policy planning and service delivery in counseling. Pre: consent.

EDCG 606 Counseling: Theory and Practice (3) Theory and techniques of counseling and guidance as preparation for practicum and internship. Application in school, college, rehabilitation, and community settings. Pre: consent.

EDCG 607 Planning and Design of Counseling Research (3) Integration and synthesis of counseling research principles in field settings; construction and formulation of research

proposals. Pre: consent and classified counseling and guidance major.

EDCG 608 Counseling: Group Theory and Practice (3) Theories and techniques of group counseling and guidance as preparation for practicum and internship. Application in school, college, rehabilitation, and community settings. Pre: 603 or 680, and 606 and consent.

EDCG 609 Tests and Inventories in Guidance (3) Tests and inventories for the assessment of aptitudes, achievement, and interests. Applications to educational, instructional, and career guidance. Pre: consent.

EDCG 611 Problems of School Adjustment (3) Principles of behavior affecting interpersonal relationships in school with emphasis on application to actual situations. Pre: consent.

EDCG 613 Counseling in the Schools (3) History, philosophy, and organization of school counseling programs. Counselor role and functions, legal and ethical issues, contemporary issues, current methodology and resources. (Meets EdD common core elective.) Pre: consent.

EDCG 614 Theory and Assessment of Intelligence (3) Theory and supervised experience in individual intelligence testing, psychological report writing; psychometric and social issues in intelligence testing. Pre: 609 and consent.

EDCG 615 Theory and Assessment of Personality (3) Personality testing; practice in administration and use of personality assessment; examination of psychometric and social issues. Pre: 609 and consent.

EDCG 620 Cross-Cultural Counseling (3) Significance of cultural factors in counseling relationships, delivery of counseling services in multicultural settings with attention to Hawai'i. Emphasis on process of cultural learning and implications for counselor roles and functions. Pre: consent.

EDCG 630 Introduction to Community Services (3) Philosophy, organization, and function of community service agencies, programs, and institutions as related to professional work in counseling and guidance. Pre: consent.

EDCG 633 Crisis Intervention (3) Professional concerns about crisis intervention strategies, and counseling skills development. Crisis theory as applied to suicide, sexual assault/rape, natural and man-made disasters, personal loss, terminal illness, life cycle crisis, and the like. A-F only. Pre: at least nine credits in EDCG courses, including 606.

EDCG 646 American College Student (3) Psychosocial characteristics of American college students and college environment, from viewpoint of student personnel work. Pre: consent. (Cross-listed as EDEA 646)

EDCG 650 Substance Abuse Counseling (3) Major theories on substance abuse behaviors, etiology, developmental aspects, socio-environmental issues, and prognosis. Theory and techniques in counseling, assessment, rehabilitation, prevention, and intervention. Pre: consent.

EDCG 654 Child Abuse: Counseling Practice and Theory (3) Historical aspects and contemporary sociocultural, and political attitudes and practices. Treatment and prevention theories and techniques in context of

developmental psychology. Pre: consent.

EDCG 660 Marriage, Family, and Child Counseling (3) Theory/practice of marriage, family, and child counseling, including major model in clinical practice; supervised counseling project by each student. Liability insurance required. Pre: 603 and 606 and 608 and consent.

EDCG 670 Consultation: Theory and Practice (3) Consultation in educational, business, health, community, and human services agencies. Pre: 603 or 680, 606, 608, and consent.

EDCG 680 Principles and Practice of Rehabilitation Counseling (3) Principles, practices of rehabilitation counseling; review of history and influence of legislation on vocational rehabilitation; current issues, developments, with emphasis on local situation. Pre: consent.

EDCG 681 Medical and Psychosocial Aspects of Disability (3) Functional implications of chronic illnesses and disabilities on psychological, social and vocational areas of an individual's life. Case studies and presentations will stimulate discussion and help students to apply theoretical information into practical everyday context. Pre: 680 and consent.

EDCG 682 Medical Aspects of Disability (3) Systematic presentation of medical aspects of most prevalent handicapping conditions. Analysis of rehabilitation process in selected cases. Pre: consent.

EDCG 683 Case Management in Rehabilitation (3) Knowledge and skills required in managing a case as well as a comprehensive caseload in both public and private sector rehabilitation sites. Specific emphasis on the professional/client relationship, interviewing process, decision-making, goal setting, recording/documentation, time management, and other tasks. A-F only. Pre: 680 and consent. Fall only.

EDCG 684 Psychopathology in Counseling (3) A discussion-oriented course (potentially Web-based). Examination of theory and practice of diagnosis in the assessment and treatment of mental disorders and the use of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) multi-axial system. Case studies will illustrate diagnostic issues. A-F only. Pre: 606 and 686, or consent.

EDCG 685 Ethical Issues for the Helping Profession (3) Developing ethical reasoning capabilities for resolution of ethical dilemmas likely to be encountered in counseling, psychology, and specialty practices (e.g., community, rehabilitation, school, mental health, alcohol and substance abuse, marriage and family counseling, and the like). A-F only. Pre: consent.

EDCG 686 Vocational Evaluation and Assessment in Rehabilitation (3) Theory, process, and techniques of vocational evaluation and assessment. Assessment methods and processes as they relate to vocational choice and adjustment of special groups. Pre: 609 and consent.

EDCG 687 Assistive Technology in Rehabilitation Counseling (3) Study of application of assistive technologies to enhance the lives of people with disabilities. Case studies provide the vehicle in guiding students toward integration of available information into reality of actual

situations. Special emphasis on the importance of using a consumer-centered approach in providing assistive technology services. A-F only. Pre: 681 and consent.

EDCG 688 Theory and Techniques of Job Placement (3) Theory, process, and techniques of job readiness, job development, and job placement. Pre: 604 and consent.

EDCG 699 Directed Reading and/or Research (V) Individual reading and/or research. Pre: written consent of instructor and department chair.

EDCG 700 Thesis Research (V) Research for master's thesis. Pre: master's Plan A candidate and consent.

EDCG 703 (Alpha) Practicum in Counseling (3) Supervised experience (150 clock hours per semester) in counseling and guidance activities, which includes a weekly class meeting: (B) elementary; (C) middle school; (D) high school; (E) college; (F) rehabilitation counseling; (G) community service. Repeatable. Pre: 603 or 680, classified counseling and guidance major, and consent.

EDCG 704 Contemporary Issues in Counseling (3) Current issues and problems. (Meets EdD common required elective.) Repeatable. Pre: consent.

EDCG 733 (Alpha) Internship (6) Supervised post-practicum experience (300 clock hours per semester) in counseling and guidance activities: (B) internship I; (C) internship II; (D) high school; (E) college; (F) rehabilitation; (G) community service. Repeatable; (G) repeatable three times. Pre: 703, classified counseling and guidance major, and consent.

EDCG 734 (Alpha) Internship II (6) Supervised post-internship I experience (300 clock hours per semester) in counseling and guidance activities: (B) elementary; (C) middle school; (D) high school; (E) college; (F) rehabilitation; (G) community service. Repeatable three times. A-F only. Pre: 733 (Alpha).

EDCG 741 Seminar in School Counseling (3) In-depth study of professional concerns in school counseling. A-F only. Pre: 703(Alpha) and classified counseling and guidance major and consent.

EDCG 751 Seminar in Community Service Counseling (3) In-depth study of professional concerns in community service counseling. A-F only. Pre: 703(Alpha) and classified counseling and guidance major and consent.

EDCG 761 Seminar in College Counseling (3) In-depth study of professional concerns in college counseling. A-F only. Pre: 703(Alpha) and classified counseling and guidance major and consent.

EDCG 781 Seminar in Rehabilitation Counseling (3) In-depth study of professional concerns in rehabilitation counseling. A-F only. Pre: 703(Alpha) and classified counseling and guidance major and consent.

Curriculum Studies (EDCS)

College of Education

EDCS 415 Early Childhood: Foundations and Curriculum (3) Two-course sequence of theory, methods, and materials for teaching

young children (2½ to 5 years). Emphasizes foundations, observation skills, and the design of learning environment. Pre: ITE 312C. (Cross-listed as ITE 415)

EDCS 415L Early Childhood: Foundations and Curriculum Lab (3) Direct experience with children in early childhood settings in order to apply concepts from 415 and develop skills in observation, teaching, and classroom management. Co-requisite: 415. (Cross-listed as ITE 415L)

EDCS 416 Early Childhood: Foundations and Curriculum (3) Continuation of 415: focuses on appropriate curriculum for young children. Pre: 415. (Cross-listed as ITE 416)

EDCS 416L Early Childhood: Foundations and Curriculum Lab (3) Continuation of 415L. Co-requisite: 416. (Cross-listed as ITE 416L)

EDCS 431 Collaborative Language and Learning (3) Examination of language (talking, reading, and writing) processes within a collaborative teaching framework in the secondary curriculum. Field experience may be required.

EDCS 432 Adolescent Literature and Literacy (3) Selection and interpretation of young adult literature, including multicultural literature for middle level and high school students. Theory and teaching strategies for integrating literacy instruction in the literature program for diverse student populations. A-F only. Pre: ITE 312D (or concurrent) or consent. DL

EDCS 433 Interdisciplinary Science Curriculum (3) Conceptual schemes and processes for integrating science curricula within the sciences and with subject areas. Methods, tools, and models of integration. Repeatable two times.

EDCS 440 Curriculum Implications of Multicultural Education (3) Examination of trends, issues, school practices, and program in multicultural education and its related area of study—bilingual-bicultural education. (Cross-listed as ITE 440)

EDCS 450 Methods and Materials in Science (3) Selecting and using methods and materials, demonstrations and simulations, open-ended experimentation, inquiry and discovery, task analysis measurement tools and techniques, activities from various curricula, opportunity for individualized goals and projects. Repeatable two times. Pre: ITE 323, ITE 404(H), teaching experience, or consent.

EDCS 451 Programs for Infants/Toddlers (3) Examination of current theory, research, issues, and models in programs for infants and toddlers, including criteria for evaluation and planning. Pre: FAMR 230 (or concurrent), FAMR 331 (or concurrent), or consent. (Cross-listed as SPED 451)

EDCS 453 Gender Issues in Education (3) Examination of current and historical issues in education and how they are impacted upon by gender, with particular reference to gender as it intersects with ethnicity and class, locally and globally. Pre: WS 151 or junior standing, or consent. (Cross-listed as EDEF 453 and WS 453) DS

EDCS 471 Special Problems in Home Economics Education (2) Individual and

group problems selected according to interests and needs of fourth- and fifth-year students in home economics education. Development of teaching materials.

EDCS 480 Issues in Computer Education (3) Integration of microcomputers into school curriculum and key issues related to microcomputer use in education. Pre: ETEC 442 or consent. (Cross-listed as ITE 480)

EDCS 494 Problem Solving in Mathematics Education (3) Experiencing and learning to teach heuristics of solving mathematical problems; designing curricula, classroom organization, evaluative measures for problem solving. Pre: ITE 324 or ITE 334, and teaching experience in mathematics; or consent.

EDCS 495 Difficulties in Learning Mathematics (3) Identification, analysis, and remediation of difficulties in learning mathematics. Pre: ITE 324 or ITE 334.

EDCS 500 Master's Plan B/C Studies (1) Enrollment for degree completion. Pre: Master's Plan B or C candidate and consent.

EDCS 600 Language, Learning and Teaching (3) Examines the role that language plays in the social construction of knowledge within various disciplines, K–adult. Collaborative group learning strategies will be modeled. A-F only. Pre: student teaching or teaching experience or consent.

EDCS 601 Advanced Topics in Reading (3) Current theories and teaching strategies of reading throughout the life span within various social contexts. Topics include emergent literacy, critical comprehension, meta-linguistic awareness, monolingual-bilingual literacy, evaluation. Must have had student teaching or teaching experience. Pre: undergraduate course in reading.

EDCS 602 Advanced Topics in Writing and Oral Language (3) Examines language and literacy learning in the context of an integrated language arts approach to curriculum and instruction. Emphasis on oral and written language. Must have student teaching or teaching experience. Pre: undergraduate course in language arts.

EDCS 603 Children's Literature in the Elementary Curriculum (3) In-depth examination of traditional and modern literature for children, with emphasis upon genre, historical development, research, curriculum development. Pre: undergraduate course in reading.

EDCS 610 Learning to Teach: The First Five Years (3) Focuses on research and practice related to the first five years of teaching. Especially recommended for beginning teachers and graduate students interested in this stage of teaching development. Repeatable one time. Pre: ITE 390 and ITE 391; or consent.

EDCS 618 Early Childhood Education: Advanced Topics (3) Analysis and practical application of selected early childhood education program and/or instructional materials. Restricted to majors. Repeatable. Pre: 415 and 416, or consent.

EDCS 622 (Alpha) School Curriculum (3) Development and improvement of curriculum. (B) early childhood; (C) elementary; (D) middle school; (E) secondary; (F) community college. Pre: ITE 312 or equivalent, and teaching

experience; for (F) only: EDEA 657, EDEF 657, or community college teaching experience; and consent.

EDCS 623 Science Curriculum (3) Application of recent developments in science, curriculum construction, and learning theory to pre-kindergarten, elementary, middle level, and secondary schools. Science content and methodology stressed. Repeatable two times.

EDCS 624 (Alpha) School Mathematics Curriculum (3) Analysis of research related to teaching and learning school mathematics, application of research to classroom practices. Appraisal of recent curriculum trends; critical examination of assumptions underlying proposed curriculum changes. (C) elementary; (D) middle; (E) secondary. Pre: teaching experience or consent.

EDCS 625 Social Studies Curriculum (3) Examination and evaluation of social science content, societal values and research findings as basis for development and revision of social studies materials, texts, curriculum guides, methodology. Pre: ITE 322 or equivalent, social studies teaching experience or consent.

EDCS 626 Art in Elementary Education (3) Principles of and problems in teaching art in elementary school; curriculum development and current approaches in art education; laboratory experiences in art media. Pre: student teaching or teaching experience.

EDCS 628 Function of Play in Early Childhood Education (3) Review of research and theory illuminating the nature, purposes, and meanings of play as a critical aspect of early childhood education. Restricted to majors. Pre: 415 and 416, or consent.

EDCS 630 Cultural Diversity and Education (3) Examines issues, theories, perspectives and practices in multicultural education and promotes awareness, encourages knowledgeable reflection and develops skills necessary for multicultural practitioners. A-F only. (Cross-listed as EDEF 630)

EDCS 632 Qualitative Research Methods (3) Methods of qualitative research in education or related social science from an interdisciplinary framework.

EDCS 637 Art in Secondary Education (3) Principles of and problems in teaching art in secondary school; current approaches in teaching art. Pre: consent.

EDCS 639 Business and Marketing Education Curriculum (3) Theory, philosophy, objectives, and development of business and marketing education curriculum. Pre: ITE 390D or consent.

EDCS 640 (Alpha) Seminar in Teaching Field (3) Study in trends, research, and problems of implementation in teaching field. (B) business and marketing education; (C) English; (F) home economics; (G) industrial education; (H) mathematics; (I) reading; (J) science; (K) social studies; (M) interdisciplinary education; (N) art; (O) physical education; (P) health education. Pre: teaching experience or consent, and undergraduate special methods course in appropriate teaching field; for (B) only: ITE 390D or consent; for (O) only: KLS 405, KLS 406, KLS 643, and teaching experience; or consent.

EDCS 641 (Alpha) Seminar in Foreign Language (3) Study in trends, research, and problems of implementation of language education instruction. (B) French; (C) German; (D) Japanese; (F) Spanish. Pre: ITE 335, teaching experience, and consent.

EDCS 642 Seminar in Issues in Multicultural Middle Level Education (1) Examination of principles of multicultural and middle-level education. Restricted to middle-level related area of master's in Secondary Education. Repeatable. Pre: consent.

EDCS 643 Public School Curriculum for Physical Education (3) Detailed examination of contents of adequate curriculum for physical education in public schools, K-12. Pre: KLS 343, ITE 405, and ITE 406; or consent. (Cross-listed as KLS 643)

EDCS 645 Seminar In Multicultural Literacy (3) Interdisciplinary examination of research and issues in the teaching and learning of literacy in diverse multicultural settings. A-F only. Pre: Course in teaching language arts of multicultural education, teaching experience, or consent.

EDCS 646 Reading Difficulties (3) Causes, prevention, and correction. Evaluation and remedial practices useful to classroom teacher. Pre: course in teaching reading and teaching experience.

EDCS 647 Clinical Procedures in Reading (3) Diagnosis; methods and materials for improvement of an individual's reading ability. Repeatable. Pre: 646, consent, and teaching experience.

EDCS 649 Theory/Practice in Cooperative Occupational Education (3) Theory and practices of coordinating cooperative education in high school and community college. Pre: teaching experience or consent.

EDCS 653 (Alpha) Mathematics in the Schools (3) School mathematics, K-12 content, curricula, pedagogy, and standards; trends and issues; theory and research. (B) number and operation; (C) patterns, functions and algebra; (D) geometry and measurement; (E) probability and statistics; (F) integrated math content. Each alpha represents a different K-12 content area. Pre: teaching experience or consent.

EDCS 655 Music in Childhood Education (3) Principles and programs in teaching music to children in early childhood settings and elementary school. Curriculum development, analysis of research, and current approaches. Pre: MUS 353 or MUS 354, teaching experience, and graduate standing. (Cross-listed as MUS 655)

EDCS 656 Seminar in Issues in ECE (V) Concepts and inquiry regarding the application of early childhood educational principles and approaches to programs serving children between birth and age five. Study and discussion of topics and problems presented in required summer courses and by invited experts in early childhood education. Restricted to Masters in Early Childhood Education. Repeatable six times. A-F only. (Two times a year)

EDCS 667 (Alpha) Seminar in Curriculum (3) Curriculum trends and issues related to school organization, program, administration, faculty. Required for Plan B MED candidates in their final semester or summer session. Repeatable one time. (B) early childhood; (C)

elementary; (D) middle-level; (E) secondary. Pre: teaching experience, 622, or consent.

EDCS 677 Curriculum Design in Early Childhood Education (3) Designed to help classroom teacher understand sources and principles of curriculum in early childhood education and to provide experience in evaluating, selecting, and developing appropriate curriculum for young children.

EDCS 695 Plan B Master's Project (V) Independent study for students working on a Plan B Master's Project. A-F only.

EDCS 699 Directed Reading and/or Research (V) Individual reading and/or research. Pre: written consent.

EDCS 700 Thesis Research (V)

EDCS 732 Qualitative Data Analysis (3) Advanced seminar in qualitative research methods with an emphasis upon qualitative data analysis, theory construction, data presentation and reporting. Pre: 632, a course in introduction to qualitative research methods, or consent.

EDCS 737 Foundations in Art Education (3) Advanced study in development and growth of art in secondary education. Pre: student teaching or teaching experience.

EDCS 760 Research on Teaching and Teacher Education (3) Examination of alternative approaches and multidisciplinary perspectives on research on teaching and learning in and out of school, on educational change, and on teacher education and professional development. Pre: classified PhD student or consent.

EDCS 767 Issues and Trends in Curriculum (3) Uses problem-centered approach and field experiences. Topics include historical review of curriculum development since 1900, examination of current curriculum practices at all levels of education, and prediction of future directions in curriculum theory and design. Pre: classified PhD student or written consent of graduate field chair.

EDCS 768 Seminar in Curriculum and Instructional Theories (3) Analysis and critical examination of models and curriculum theory and theories of instruction leading to generation of theories by seminar members. Pre: classified PhD student or consent. Recommended: EDEP 408.

EDCS 769 Curriculum Evaluation (3) Analysis and critical examination of theoretical positions on curriculum evaluation and of models of the process of curriculum evaluation. Pre: consent. Recommended: EDEA 602, EDEP 408, or EDEP 608.

Dance (DNCE)

College of Arts and Humanities

DNCE 121 Beginning Ballet Technique (3) Introduction to classical ballet technique. Repeatable three times. **DA**

DNCE 122 Continuing Ballet Technique (3) Continuation of beginning classical ballet technique. Repeatable. Pre: 121 or consent. **DA**

DNCE 131 Beginning Modern Dance Technique (3) Introduction to modern dance technique. Repeatable. **DA**

- DNCE 132 Continuing Modern Technique (3)** Continuation of beginning modern dance technique. Repeatable. Pre: 131 or consent. **DA**
- DNCE 141 Beginning Jazz Technique (3)** Introduction to beginning jazz technique. **DA**
- DNCE 142 Continuing Jazz Technique (3)** Continuation of beginning jazz technique. Repeatable. Pre: 141 or consent. **DA**
- DNCE 150 Introduction to Dance (3)** Survey the development of major dance styles and their relationship to contemporary choreography. **DA**
- DNCE 151 Music Theory for Dancers (3)** Elements of music and relationship to dance; emphasis on rhythmic analysis. (Alt. years) **DA**
- DNCE 221 Low Intermediate Ballet Technique (3)** Low intermediate ballet technique. Repeatable. Pre: 122 or consent. **DA**
- DNCE 222 Low Intermediate Ballet Technique (3)** Low intermediate ballet technique. Repeatable. Pre: 221 or consent. **DA**
- DNCE 231 Low Intermediate Modern Technique (3)** Low intermediate modern dance technique. Repeatable. Pre: 131 or consent. **DA**
- DNCE 232 Low Intermediate Modern Technique (3)** Low intermediate modern dance technique. Repeatable. Pre: 231 or consent. **DA**
- DNCE 250 Dance Production (3)** Survey of historical, theoretical, and practical aspects; work in scenery, lighting, costume, makeup, and theater management. **DA**
- DNCE 255 Dance in World Cultures (3)** Multimedia overview of world dance forms, with emphasis on Asia and the Pacific, and related concepts. Pre: sophomore standing or consent. **DA**
- DNCE 260 Movement Fundamentals (1)** Organized somatic systems as a framework for understanding movement and dance techniques. Required for majors. Repeatable twice. **DA**
- DNCE 301 Asian Dance I (V)** Performance and techniques at the introductory level. Pre: upper division standing or consent. Repeatable. **DA**
- DNCE 302 Chinese Dance I (1)** Performance and techniques at the introductory level. Pre: upper division standing or consent. **DA**
- DNCE 303 Japanese Dance I (1)** Performance and techniques at the introductory level. Pre: upper division standing or consent. **DA**
- DNCE 304 Javanese Dance I (1)** Performance and techniques at the introductory level. Pre: upper division standing or consent. **DA**
- DNCE 305 Korean Dance I (1)** Performance and techniques at the introductory level. Pre: upper division standing or consent. **DA**
- DNCE 306 Okinawan Dance I (1)** Performance and techniques at the introductory level. Pre: upper division standing or consent. **DA**
- DNCE 307 Philippine Dance I (1)** Performance and techniques at the introductory level. Pre: upper division standing or consent. **DA**
- DNCE 311 Oceanic Dance I (1)** Performance and techniques at the introductory level. Pre: upper division standing or consent. **DA**
- DNCE 321 Intermediate Ballet Technique (3)** Intermediate ballet technique. Repeatable. Pre: 222 or consent. **DA**
- DNCE 331 Intermediate Modern Technique (3)** Intermediate modern dance technique. Repeatable. Pre: 232 or consent. **DA**
- DNCE 334 Taiji (T'ai Chi) for Actors I (3)** Basic Taijiquan (T'ai Chi Ch'uan) movement training. Pre: THEA 221 and THEA 222, or consent. (Cross-listed as THEA 334) **DA**
- DNCE 360 Dance Kinesiology (3)** Practical information for dance students on diet and nutrition, anatomy, training and conditioning, and injury prevention. Pre: 260 or consent. **DA**
- DNCE 361 Elementary Labanotation (3)** Elementary theory of Labanotation with practical application in scoring and reconstructing dances. Pre: 151 or MUS 280, or consent. (Alt. years) **DA**
- DNCE 362 Intermediate Labanotation (3)** Intermediate theory of Labanotation with practical application in scoring and reconstructing dances. Pre: 361 or consent. (Alt. years) **DA**
- DNCE 370 Dance Improvisation (3)** Improvisation in dance as creative experience, as source of new movement ideas, and as means of developing spontaneity in performance. Repeatable. Pre: 222, 232, or consent. **DA**
- DNCE 371 Dance Composition I (3)** Elementary techniques and theories for creating and crafting concert dances. Pre: 370 and 231, or consent. **DA**
- DNCE 372 Dance Composition II (3)** Intermediate techniques and theories for creating and crafting concert dances. Pre: 371 or consent. **DA**
- DNCE 401 Asian Dance II (V)** Performance and techniques at intermediate level. Repeatable. Pre: 301 or consent. **DA**
- DNCE 402 Chinese Dance II (1)** Performance and techniques at intermediate level. Repeatable. Pre: 302 or consent. **DA**
- DNCE 403 Japanese Dance II (1)** Performance and techniques at intermediate level. Repeatable. Pre: 303 or consent. **DA**
- DNCE 404 Javanese Dance II (1)** Performance and techniques at intermediate level. Repeatable. Pre: 304 or consent. **DA**
- DNCE 405 Korean Dance II (1)** Performance and techniques at intermediate level. Repeatable. Pre: 305 or consent. **DA**
- DNCE 406 Okinawan Dance II (1)** Performance and techniques at intermediate level. Repeatable. Pre: 306 or consent. **DA**
- DNCE 407 Philippine Dance II (1)** Performance and techniques at intermediate level. Repeatable. Pre: 307 or consent. **DA**
- DNCE 411 Oceanic Dance II (1)** Performance and techniques at intermediate level. Repeatable. Pre: 311 or consent. **DA**
- DNCE 421 Advanced Ballet Technique (3)** Advanced ballet technique. Repeatable. Pre: 321 or consent. **DA**
- DNCE 431 Advanced Modern Technique (3)** Advanced modern dance technique. Repeatable. Pre: 331 or consent. **DA**
- DNCE 433 Movement Workshop (V)** Special workshops in movements relating to specific departmental theatrical productions beyond the scope of movement taught in 437 and 438. Repeatable one time. Pre: one of 435, THEA 435, or consent. (Cross-listed as THEA 433) (Alt. years) **DA**
- DNCE 434 Taiji (T'ai Chi) for Actors II (3)** Intermediate-level Taijiquan (T'ai Chi Ch'uan) movement training. Pre: 334 or consent. (Cross-listed as THEA 434) **DA**
- DNCE 435 Movement for Actors (3)** Training actors to discover experientially the sources of movement; to teach skills for analyzing movement for its mechanical, anatomical, spatial, and dynamic content; and then to apply these skills in a role. Pre: 231 or THEA 222. (Cross-listed as THEA 435) **DA**
- DNCE 436 Advanced Movement for Actors (3)** Detailed development of material presented in 435. Focus on Bartenieff fundamentals and movement analysis as it applies to the physical interpretation of theatrical roles. Pre: 435 or THEA 435, or consent. (Cross-listed as THEA 436) (Alt. years) **DA**
- DNCE 437 Period Movement Styles, 1450–1650 (3)** Movement styles and social deportment of European societies in the Renaissance and early Baroque periods. Pre: 435, THEA 435, one semester of a 100-level dance technique class, or consent. (Cross-listed as THEA 437) (Alt. years) **DA**
- DNCE 438 Period Movement Styles, 1650–1800 (3)** Movement styles and social deportment of the Baroque and pre-Romantic periods in Europe and the American colonies. Pre: 435, THEA 435, one semester of a 100-level dance technique class, or consent. (Cross-listed as THEA 438) (Alt. years) **DA**
- DNCE 439 Musical Theater Dance Forms (3)** Theatrical dance forms used in 20th-century musical theater. Pre: one of 221, 231, or THEA 421; or consent. (Cross-listed as THEA 439) (Alt. years) **DA**
- DNCE 452 Dance History I: Ritual to Theater (3)** Development of Western theatrical dance from Ancient Greece through 19th-century ballet. Pre: upper division standing or consent. **DH**
- DNCE 453 Dance History II: 20th Century to the Present (3)** Development of modern dance, contemporary ballet, and dance forms of musical theater and film. Pre: upper division standing or consent. **DH**
- DNCE 458 Field Experiences in Dance (V)** Field experiences in relevant contexts under professional and faculty supervision. Repeatable one time. CR/NC only. Pre: upper division standing and consent. **DA**
- DNCE 459 Topics in Dance (V)** Readings, research, and/or field and movement experiences. Repeatable if topic changes. Pre: upper division standing and consent.
- DNCE 470 Dance Performance (1)** Performance in various dance styles and settings. Repeatable. Pre: audition or consent. **DA**
- DNCE 480 Dance Repertory (V)** Preparation of standard and new works for performance. Repeatable. Pre: consent. **DA**
- DNCE 490 Creative Dance (3)** Dance activities for young people. Appropriate for teachers, group workers, recreation majors, and others working with children. Also adults with special needs. Supervised field activities. Pre: upper division standing or consent. **DA**

DNCE 495 Senior Project (1) Individual choreographic project; student choreographs, performs, and oversees all technical aspects of a creative project; tutorial. Pre: 372, senior standing, and consent. **DA**

DNCE 499 Directed Work (V) Individual projects, tutorial. Pre: consent.

DNCE 500 Master's Plan B/C Studies (1) Enrollment for degree completion. Pre: master's Plan B or C candidate and consent.

DNCE 618 Digital Multimedia Tools for Performance Research (3) Dance, Theatre, Music Majors only. A-F only. Repeatable one time. Pre: consent. (Cross-listed as THEA 618)

DNCE 651 Seminar in Dance Research (3) Research materials and methods; preparation for thesis and scholarly research reporting. Required for graduate concentrations in dance. (Alt. years)

DNCE 652 Seminar: Dance Theory and Criticism (3) Major theories of dance and dance criticism; emphasis on Western ideas. Pre: 452 and 453, or consent.

DNCE 653 Dance Ethnology Seminar (3) Exemplary studies and field research. (Alt. years)

DNCE 654 Regional Dances of Asia (3) Dance content and historico-social context of principal dance traditions. Repeatable. (Alt. years)

DNCE 655 Regional Dances of Oceania (3) Dance content and historico-social context of principal dance traditions. Repeatable. (Alt. years)

DNCE 659 Advanced Topics in Dance (V) Readings, research, and/or field movement experiences. Repeatable if topic changes. Pre: graduate standing or consent.

DNCE 660 Laban Movement Analysis (3) Study and application of Laban Movement Analysis as a framework for enhancing analytical and artistic abilities. Pre: 260 (or concurrent) and 360 (or concurrent); or consent.

DNCE 661 Advanced Problems in Movement Analysis (3) Advanced skills in movement analysis and interpretation of movement scores. Emphasis on Labanotation. Repeatable. Pre: 362. (Alt. years)

DNCE 671 Advanced Choreography (3) Advanced analytic and creative study. Pre: 372 or consent. (Alt. years)

DNCE 672 Dance Performance (V) Graduate performance in various dance styles and settings. By audition only. Repeatable. Pre: consent.

DNCE 679 Directed Choreography (1) Concert choreography for selected performance settings under the direction of a faculty adviser. Repeatable. Pre: 372 (or concurrent) or 671 (or concurrent); or consent.

DNCE 684 Theatre Governance (3) Covers the economic and managerial skills for starting a professional and/or non-profit theatre company or performing arts organization: artistic directorship, board development, non-profit legalities, season planning, fundraising, budgeting, publicity, international activities, etc. Pre: THEA 600 or consent. (Cross-listed as THEA 684)

DNCE 691 Seminar in Teaching Dance/Theater (3) Pedagogy and classroom experience in teaching technique and theory. (Cross-listed as THEA 691) (Alt. years)

DNCE 692 Seminar: in Youth Theatre/Dance (3) Theories and methods applied in theatrical experiences with and for children: creative movement/drama, puppetry, and theater/dance. Pre: one of 490, THEA 470, THEA 474, THEA 475, THEA 476 or THEA 477. (Cross-listed as THEA 779)

DNCE 693 Internship: Youth Theater/Dance (V) Supervised leadership experiences in dance/theater program with children. Students spend nine hours per week in supervised setting and three hours in weekly class meeting. Pre: 490, THEA 470, or THEA 476; or consent. (Cross-listed as THEA 693)

DNCE 695 Dance Colloquium (1) Forum for presentation and discussion of current intellectual and artistic activities in the dance field. Repeatable three times. Pre: consent.

DNCE 699 Directed Reading and Research (V) Individual projects: tutorial. Pre: consent.

DNCE 700 Thesis Research (V)

DNCE 790 Issues in Youth Theater (3) Examination of current issues, problems, and future directions in curriculum theory and design as it applies to theater and dance education. Pre: one of 490, THEA 470, or THEA 474; or consent. (Cross-listed as THEA 778)

Dental Hygiene (DH)

School of Nursing and Dental Hygiene

Dental hygiene courses must be taken in sequence and are open only to those admitted to the program by the Department of Dental Hygiene.

DH 231 Oral Anatomy and Tooth Morphology (2) The study of the structure and functions of the head and neck with emphasis on structures in or related to the oral cavity; of tooth morphology. Repeatable one time. A-F only. Pre: BIOC 241, PHYL 103, PHYL 103L, or equivalent. Co-requisite: 231L. **DB**

DH 231L Oral Anatomy and Tooth Morphology Lab (2) (2 3-hr Lab) Application of DH 231 didactic concepts to laboratory activities and practices. Repeatable one time. A-F only. Pre: BIOC 241 and PHYL 103, PHYL 103L, or equivalent. Co-requisite: 231. **DY**

DH 238 Basic Dental Hygiene I (2) Relationship to dentistry, problems, trends, issues; role and functions of dental hygienists in prevention and control of chronic oral diseases; preliminary dental hygiene clinical and support procedures including vital signs; team concepts in dentistry. Repeatable one time. A-F only. Co-requisite: 238L and 239L. **DB**

DH 238L Basic Dental Hygiene I Lab (1) Application of preliminary dental hygiene clinical and support procedures including instrumentation, vital signs, and team concepts in dentistry. Repeatable one time. A-F only. Co-requisite: 238 and 239L. **DY**

DH 239L Basic Dental Hygiene I Lab (1) Application of preliminary dental hygiene clinical and support procedures including instrumentation, vital signs, and team concepts in dentistry. Repeatable one time. A-F only. Co-requisite: 238/238L. **DY**

DH 240 Basic Dental Hygiene II (2) Basic dental hygiene theory and skills including competencies in health history taking, examination, patient care plan, oral prophylaxis, application of caries preventive agents, plaque control and support procedures. A-F only. Pre: 238, 238L and 239L. Co-requisite: 240L, 241L and 242L. **DB**

DH 240L Basic Dental Hygiene Lab/Clinic (1) (1 4-hr Lab/Clinic) Laboratory and clinical experiences in basic dental hygiene skills and competencies including history taking, examination, patient care plan, oral prophylaxis, application of caries preventive agents, and clinic procedures. A-F only. Pre: 238 and 238L. Co-requisite: 240, 241L, and 242L.

DH 241L Basic Dental Hygiene Lab/Clinic (1) (1 6-hr Lab/Clinic) Laboratory and clinical experiences in basic dental hygiene skills and competencies including history taking, examination, patient care plan, oral prophylaxis, application of caries preventive agents, and clinic support procedures. A-F only. Pre: 238 and 238L. Co-requisite: 240, 240L, and 242L. **DY**

DH 242L Basic Dental Hygiene Lab/Clinic (1) (1 4-hr Lab/Clinic) Laboratory and clinical experiences in basic dental hygiene skills and competencies including history taking, examination, patient care plan, oral prophylaxis, application of caries preventive agents, and clinic support procedures. A-F only. Pre: 238 and 238L. Co-requisite: 240, 240L, 241L. **DY**

DH 250 General and Oral Histology and Embryology (2) Cells and tissues and their embryologic origin, with particular reference to teeth and their supporting structures. Pre: 231 (or concurrent). Fall only. **DB**

DH 251 General and Oral Histology and Embryology (1) Continuation of 250. Pre: 250. Spring only. **DB**

DH 281 Dental Radiography (2) Basic principles of radiation and fundamental information to understand and safely use radiation in dental radiography. A-F only. Repeatable. Pre: 231. Co-requisite: 281L.

DH 281L Dental Radiography Lab/Clinic (1) (1 3-hr Lab/Clinic) Preparation and evaluation of radiographic survey of patients with varying dentition; methods, and indications of safety considerations in clinical application of roentgen rays. A-F only. Repeatable. Pre: 231. Co-requisite: 281.

DH 361 Health Education and Promotion (2) Provides an overview of the concepts and application of health education and health promotion theories and principles as applies to individuals, groups and the larger public. Pre: open to non-nursing majors with consent. (Cross-listed as NURS 361) Fall only.

DH 366 General and Oral Pathology (2) Nature and causes of disease, progress and termination or associated alterations of tissue, diseases affecting teeth and structures of oral cavity. Pre: 250 and 251 (or concurrent). Spring only. **DB**

DH 367 General and Oral Pathology (1) Continuation of 366. Pre: 366. Fall only. **DB**

DH 369 Dental Materials (1) Science of dental materials and its application to dentistry and dental hygiene. Repeatable one time. A-F only. Pre: 231. Co-requisite: 369L.

DH 369L Dental Materials Lab/Clinic (1) Laboratory and clinical application of concepts in the science of dental materials. Repeatable one time. A-F only. Pre: 231. Co-requisite: 369.

DH 370 Expanded Functions in Dental Hygiene (2) Basic concepts of expanded functions in dental hygiene. A-F only. Repeatable. Pre: 369. Co-requisite: 370L.

DH 370L Expanded Functions Lab/Clinic (1) (2 1.5-hr Lab/Clinic) Application of basic concepts of expanded functions in dental hygiene. A-F only. Repeatable. Pre: 369. Co-requisite: 370.

DH 375 Clinical Dental Hygiene I (2) Development of dental hygiene concepts and skills; emergency procedures; team approach to dentistry, planning, implementing and evaluating total oral hygiene care of patients; review and critical analysis of current dental periodicals and research. Repeatable one time. A-F only. Pre: 240/240L, 241L, 242L, 281/281L, and 389. Co-requisite: 375L, 376L, 377L, and 378L.

DH 375L Clinical Dental Hygiene I Clinic (1) Clinical instruction and application of dental hygiene concepts and skills; emergency procedures; team approach to dentistry; planning, implementing, and evaluating total oral hygiene care of patients; review and critical analysis of current dental periodicals and research. Repeatable one time. A-F only. Pre: 240/240L, 241L, 242L, 281/281L, and 389. Co-requisite: 375, 376L, 377L, and 378L.

DH 376L Clinical Dental Hygiene I Clinic (1) Clinical instruction and application of dental hygiene concepts and skills; emergency procedures; team approach to dentistry; planning, implementing, and evaluating total oral hygiene care of patients; review and critical analysis of current dental periodicals and research. Repeatable one time. A-F only. Pre: 240/240L, 241L, 242L, 281/281L, and 389. Co-requisite: 375/375L, 377L, and 378L.

DH 377L Clinical Dental Hygiene I Clinic (1) Clinical instruction and application of dental hygiene concepts and skills; emergency procedures; team approach to dentistry; planning, implementing, and evaluating total oral hygiene care of patients; review and critical analysis of current dental periodicals and research. Repeatable one time. A-F only. Pre: 240/240L, 241L, 242L, 281/281L, and 389. Co-requisite: 375, 375L, 376L, and 378L.

DH 378L Clinical Dental Hygiene I Clinic (1) Clinical instruction and application of dental hygiene concepts and skills; emergency procedures; team approach to dentistry; planning, implementing, and evaluating total oral hygiene care of patients; review and critical analysis of current dental periodicals and research. Repeatable one time. A-F only. Pre: 240/240L, 241L, 242L, 281/281L, and 389. Co-requisite: 375/375L, 376L, and 377L.

DH 380 Clinical Dental Hygiene II (2) Continuation of 375. Pre: 375. Spring only.

DH 380L Clinical Dental Hygiene II Clinic (1) (1 6-hr Clinic) Continuation of 375. Clinical application of dental hygiene concepts and skills; emergency procedures; team approach to dentistry; planning, implementing and evaluating total oral hygiene care to patients. A-F only. Pre: 375. Co-requisite: 380, 381L and 382L.

DH 381L Clinical Dental Hygiene II Clinic (1) (1 6-hr Clinic) Continuation of 375. Clinical application of dental hygiene concepts and skills; emergency procedures; team approach to dentistry; planning, implementing, and evaluating total oral hygiene care to patients. A-F only. Pre: 375. Co-requisite: 380, 380L and 382L.

DH 382L Clinical Dental Hygiene II Clinic (1) (1 4-hr Clinic) Continuation of 375. Clinical application of dental hygiene concepts and skills; emergency procedures; team approach to dentistry; planning, implementing, and evaluating total oral hygiene care to patients. A-F only. Pre: 375. Co-requisite: 380, 380L and 381L.

DH 389 Pain Control and Local Anesthesia in Dentistry (2) Basic concepts of pain control and local anesthesia in dentistry with appropriate emphasis on psychological preparation, pharmacological preparation, and safe and effective administration of anesthesia in the practice of dental hygiene. Pre: 231 and 250. Co-requisite: 240, 251, and 366. Spring only. **DB**

DH 390 Periodontology I (2) Normal periodontium, etiology, pathogenesis, clinical manifestations and epidemiology of periodontal diseases, and mode of periodontal therapy. Repeatable one time. A-F only. Pre: 240, 251, and 366. Fall only. **DB**

DH 391 Periodontology II (2) Continuation of DH 390. Normal Periodontium, etiology, pathogenesis, clinical manifestations and epidemiology of periodontal diseases, and mode of periodontal therapy. Repeatable one time. A-F only. Pre: 390. Spring only. **DB**

DH 473 Community Health (3) Introduction and application of the principles of health education and dental public health into practice in schools, community agencies, and private dental offices (inclusive of problem assessment, planning, implementation and evaluation processes); epidemiology and biostatistics. A-F only. Pre: 361. Fall only.

DH 475 Advanced Clinical Dental Hygiene II (2) An in-depth knowledge and clinical application of expanded function in periodontics with emphasis on principles, techniques, procedures in pain-anxiety control, soft tissue curettage, host factors, and modification of behavior. Repeatable one time. A-F only. Pre: 380/380L, 381L, 382L and 391. Co-requisite: 475L, 476L, 477L, 478L.

DH 475L Advanced Dental Hygiene I Clinic A (1) Application of knowledge of expanded functions in periodontics with emphasis on principles, techniques, procedures in pain-anxiety control, soft tissue curettage, host factors, and modification of behavior. Repeatable one time. A-F only. Pre: 380/380L, 381L, 382L and 391. Co-requisite: 475, 476L, 477L and 478L. Fall only.

DH 476L Advanced Dental Hygiene I Clinic B (1) Application of knowledge of expanded functions in periodontics with emphasis on principles, techniques, procedures in pain-anxiety control, soft tissue curettage, host factors, and modification of behavior. Repeatable one time. A-F only. Pre: 380/380L, 381L, 382L and 391. Co-requisite: 475, 475L, 477L and 478L. Fall only.

DH 477L Advanced Dental Hygiene I Clinic C (1) Application of knowledge of expanded functions in periodontics with emphasis on principles, techniques, procedures in pain-anxiety control, soft tissue curettage, host factors, and modification of behavior. Repeatable one time. A-F only. Pre: 380/380L, 381L, 382L and 391. Co-requisite: 475, 475L, 476L and 478L. Fall only.

DH 478L Advanced Dental Hygiene I Clinic D (1) Application of knowledge of expanded functions in periodontics with emphasis on principles, techniques, procedures in pain-anxiety control, soft tissue curettage, host factors, and modification of behavior. Repeatable one time. A-F only. Pre: 380/380L, 381L, 382L and 391. Co-requisite: 475, 475L, 476L and 477L. Fall only.

DH 480 Advanced Clinical Dental Hygiene II (2) In-depth knowledge development of expanded functions in periodontics with emphasis on principles, techniques, procedures in pain-anxiety control, soft tissue curettage, host factors, and modifications in behavior. Repeatable one time. A-F only. Pre: 475, 475L, 476L, 477L and 478L. Co-requisite: 480L, 481L, 482L, 483L. Spring only.

DH 480L Advanced Clinical Dental Hygiene II Clinic (1) (1 4-hr Clinic) Application of knowledge of expanded functions in periodontics with emphasis on principles, techniques, procedures in pain-anxiety control, soft tissue curettage, host factors, and modification of behavior. Repeatable one time. A-F only. Pre: 475, 475L, 476L, 477L and 478L. Co-requisite: 480, 481L, 482L, 483L. Spring only.

DH 481L Advanced Clinical Dental Hygiene II Clinic (1) (1 4-hr Clinic) Application of knowledge of expanded functions in periodontics with emphasis on principles, techniques, procedures in pain-anxiety control, soft tissue curettage, host factors, and modification of behavior. Repeatable one time. A-F only. Pre: 475, 475L, 476L, 477L and 478L. Co-requisite: 480, 480L, 482L, 483L. Spring only.

DH 482L Advanced Clinical Dental Hygiene II Clinic (1) (1 4-hr Clinic) Application of knowledge of expanded functions in periodontics with emphasis on principles, techniques, procedures in pain-anxiety control, soft tissue curettage, host factors, and modification of behavior. Repeatable one time. A-F only. Pre: 475, 475L, 476L, 477L and 478L. Co-requisite: 480, 480L, 481L, 483L. Spring only.

DH 483L Advanced Clinical Dental Hygiene II Clinic (1) (1 4-hr Clinic) Application of knowledge of expanded functions in periodontics with emphasis on principles, techniques, procedures in pain-anxiety control, soft tissue curettage, host factors, and modification of behavior. Repeatable one time. A-F only. Pre: 475, 475L, 476L, 477L and 478L. Co-requisite: 480, 480L, 481L, 482L. Spring only.

DH 499 Directed Reading, Field Work, or Research (V) Individualized program of directed reading, field work, or research for major under supervision in related areas of dentistry and dental hygiene. Pre: consent.

Disability and Diversity Studies (DIS)

College of Education

DIS 691 Multicultural Issues in Disabilities (3) Provide background and understanding of various Pacific Rim cultural issues in the conceptualization and treatment of individuals with disabilities and their families. A-F only.

DIS 693 Interdisciplinary Disability and Diversity Issues (3) Develop understanding of current issues faced by individuals with disabilities and their families within the disability paradigm and across cultures. A-F only.

DIS 694 Interdisciplinary Team Development (3) Develop knowledge and skills to participate effectively on interdisciplinary teams for the common goal of promoting service integration and coordination of education, social, health, mental health, and other services with individuals with disabilities and their families. A-F only.

DIS 695 Interdisciplinary Assessment (3) Assessment methods and techniques to instructional research-based practices and supports across disciplines, cultures and PK-12 that address barriers to learning for all students with the context of the Comprehensive Student Support System (CSSS). A-F only. Co-requisite: 696.

DIS 696 Advanced Interdisciplinary Assessment (3) Assessment methods and techniques to instructional research-based practices and supports across disciplines, cultures and PK-12 that address barriers to learning for all students with the context of the Comprehensive Student Support System (CSSS). A-F only. Co-requisite: 695.

DIS 697 Advanced Interdisciplinary Teams (3) Facilitating effective interdisciplinary teams that follow the latest legislation and policy decisions, are based on research-based practices, and build capacity to provide supports to enhance student's learning with application to actual situations. A-F only.

DIS 698 Portfolio/Field Work (3) Interdisciplinary community experience and portfolio in disability and diversity studies. Repeatable three times. A-F only.

DIS 699 Directed Reading and/or Research (V) Directed reading and/or research Repeatable three times. A-F only. Pre: consent.

DS

See *Information Technology Management*

Dutch (DUTC)

College of Languages, Linguistics and Literature

Students choosing Dutch for the language requirement should realize it may not be offered if demand is limited.

DUTC 101 Elementary Dutch (4) Conversation, lab drill, grammar, reading. **HSL**

DUTC 102 Elementary Dutch (4) Continuation of 101. **HSL**

DUTC 107 Dutch for Reading Purposes (V) Reading of scholarly and technical Dutch. Does not fulfill the language core requirement.

DUTC 201 Intermediate Dutch (3) Reading, conversation, and composition. Rapid reading skills, listening to lectures in Dutch. Pre: 102. **HSL**

DUTC 202 Intermediate Dutch (3) Continuation of 201. **HSL**

East Asian Languages and Literatures (EALL)

College of Languages, Linguistics and Literature

All students taking language courses in this department for the first time must take a regularly scheduled placement test in the appropriate language; those with no background must come to the department office for a brief interview. A grade of C or better in the prerequisite courses is required for continuation.

EALL 140 Introduction to Chinese Language and Culture (3) The purpose of this course is to provide students with interesting perspectives and some general knowledge of Chinese language, literature, and culture, and to let students sample what the Chinese faculty has to offer. **DH**

EALL 271 Japanese Literature in Translation—Traditional (3) Survey of all major forms from the earliest era to mid-19th century. **DL**

EALL 272 Japanese Literature in Translation—Modern (3) Survey from mid-19th century to present; emphasis on fiction. **DL**

EALL 273 Survey of Japanese Literature—KIC (3) Survey of traditional and modern Japanese literature in translation, covering all major genres. Only offered at Konan University in Japan. Not open to students with 271 or 272. **DL**

EALL 281 Korean Literature in Translation—Traditional (3) Survey of Korean literature from earliest times with emphasis on development and cultural context; all readings in English translation. Students write essays about the readings. **DL**

EALL 282 Korean Literature in Translation—Modern (3) Survey of 20th-century Korean literature with emphasis on development and cultural context; all readings in English translation. Students write essays about the readings. **DL**

EALL 325 (Alpha) Japanese Film: Art and History (3) Study and analysis of Japanese film; its history and relationship to cultural, social, philosophical, and aesthetic contexts. (B) 1900-1960; (C) 1960-present; (D) special topics. Pre: upper division standing or consent. (Cross-listed as ASAN 325) **DH**

EALL 360 Literary Traditions of East Asia (3) Selected works of Chinese, Japanese, and Korean literature in English; relationships and parallels. Pre: one of ENG 250-257 or consent. **DL**

EALL 361 Chinese Literature: Ancient (3) Survey of all major genres from antiquity until the ninth century. Pre: one of ENG 250-257 or consent. **DL**

EALL 362 Chinese Literature: Pre-modern (3) Survey of all major genres from the ninth

into the 20th-century. Pre: one of Eng 250-257 or consent. **DL**

EALL 363 (Alpha) 20th-Century Chinese Literature and Culture (3) Survey of 20th-century Chinese literature in translation. Includes a variety of genres from the People's Republic of China, Taiwan, and Hong Kong; (B) 1919-1949; (C) 1949-present. Pre: 361, 362, or one of Eng 250-257; or consent. **DL**

EALL 364 20th-Century Literature by Chinese Women (3) A survey and critical examination of contemporary Chinese women writers from China, Taiwan, and Hong Kong. This course traces a genealogy of women's writing from the early 1920s up until now through novels, poetry, drama, and film. Pre: one of 271, 361, ENG 250, or WS 151. (Cross-listed as WS 346) **DL**

EALL 365 (Alpha) Traditional Chinese Fiction in Translation (3) Survey of pre-modern Chinese fiction in translation. (B) short story; (C) novel. Pre: 361 or 362 or one of ENG 250-257; or consent. **DL**

EALL 371 (Alpha) Traditional Japanese Literature (3) Reading and analysis of English translations of selected important works in the classical tradition. No knowledge of Japanese required: (B) prose fiction and literary miscellany; (C) drama and poetry. **DL**

EALL 372 (Alpha) Modern Japanese Literature (3) Reading and analysis of English translations of selected important works in modern Japanese literature. No knowledge of Japanese required: (B) fiction; (C) poetry, drama, and criticism. **DL**

EALL 384 Modern Korean Women Writers and Culture (3) Study of fiction by modern Korean women writers in the changing context of Korean culture. A-F only. Pre: 282 or consent.

EALL 472 East-West Encounter Literature (3) Critical examination of selected literary works depicting East-West encounters from the mid-19th to the mid-20th centuries. Pre: two courses from 271, 272, ENG 250, or ENG 255; or consent of department chair/program director. **DL**

EALL 473 Chinese Diaspora and Visual Media (3) Course focuses on the role of visual media in shaping social relationships and cultural practices of Chinese communities living in Taiwan, Hong Kong, Southeast Asia, Europe, and Northern America. Includes examinations of films, theatre and musical productions, video-culture, art exhibitions, and photography. Pre: any 300-level course in EALL, AMST, ENG, ES, or WS; or consent. (Cross-listed as ASAN 473) **DH**

EALL 474 Transnational Chinese Popular Culture (3) Course surveys a variety of Chinese popular cultural forms which are transnational in nature, i.e. extending beyond the national boundaries of the PRC. The cultural influences of Taiwan, Hong Kong, and Singapore will be traced through examining soap-operas, karaoke-culture, rock music, martial arts, commercial novels, video games, and children animation. Pre: any 300-level course in EALL, AMST, ENG, ES, or WS; or consent. (Cross-listed as ASAN 474) **DH**

EALL 491 Senior Colloquium in East Asian Literature (3) Comparative perspectives; some works studied in the original. Pre: third-level East Asian language. **DL**

EALL 492 (Alpha) Study of East Asian Languages (V) Less commonly taught languages of East Asia: (B) Manchu; (C) Mongolian. Recommended: previous experience in history, linguistics, or languages. Pre: consent.

EALL 500 Master's Plan B/C Studies (1)

EALL 590 Intensive Japanese for Reading Knowledge (4) Open to graduate students only. CR/NC only. Pre: consent.

EALL 591 Intensive Japanese for Reading Knowledge (4) Open to graduate students only. CR/NC only. Pre: 590 or consent.

EALL 601 Method of Teaching East Asian Languages (3) Identification and analysis of problems in language learning, teaching, testing. Development of teaching strategies for East Asian languages. Pre: CHN 451, JPN 451, or KOR 451.

EALL 603 (Alpha) Bibliographical and Research Methods (3) Traditional and modern references and other library materials basic to research in all areas of East Asian studies: (C) Chinese; (J) Japanese; (K) Korean. Pre: CHN 402 for (C); JPN 407 (alpha) for (J); KOR 402 for (K).

EALL 691 Introduction to Classical Tibetan (3) Introduction to Classical Tibetan grammar and vocabulary with emphasis on the earliest Tibetan texts; reading and analysis of pre-classical, classical and postclassical texts. Meets 3 hours a week.

EALL 699 Directed Research (V) CR/NC only. Pre: consent.

EALL 700 Thesis Research (V)

EALL 735 Seminar in Comparative East Asian Literature (3) Comparison of authors, modes, topics, and genres in poetry and prose; theoretical and practical criticism. Pre: consent.

EALL 750 Seminar in Comparison of East Asian Languages (3) Comparison of lexicon, phonology, morphology, syntax, semantics, etc., of two or more East Asian languages, contact influence on them. Pre: CHN 451, CHN 452, or JPN 451; or consent.

EALL 800 Dissertation Research (1)

Economics (ECON)

College of Social Sciences

Sophomore standing or consent is prerequisite to all 300-level courses except as noted. No more than 6 credit hours total for 120, 130, 131, and 230.

ECON 120 Introduction to Economics (3) A one-semester survey of the principles of microeconomics and macroeconomics to enable students in all disciplines to understand current economic events. This course cannot be used in lieu of 130 or 131 for students who wish to major or minor in economics or enter the College of Business Administration. **DS**

ECON 130 Principles of Economics (3) Examination of the decision-making process of both households and firms. Analysis of the functioning of a competitive market system, using supply and demand models and the role of government in cases where the market system fails. Additional topics include the effects of international rate on the welfare of a nation and the effects of different competitive market structures on society. **DS**

ECON 131 Principles of Economics (3) An introduction to macroeconomics—the study of the overall economy. Topics include the determination of national income, causes and effects of inflation, unemployment, and income inequality; causes and consequences of international differences in economic growth; sources of business cycle expansions and contractions; role of government policy in stabilizing the economy and promoting long-term growth; financial markets and monetary policy; taxes, spending, consequences of budget deficits, determination of trade imbalances, exchange rate fluctuations, and balance of payment crises. **DS**

ECON 230 Principles of Economics for Business (3) Nature of economics; market economic forces; demand, supply, and price; market adjustment; theories of household and firm behavior; competition and monopoly; national income and price level; fiscal and monetary policy; gains from trade. Pre: BUS 250 or MATH 241. **DS**

ECON 300 Intermediate Economics: Macroeconomic Analysis (3) Course develops basic techniques and fundamental concepts used to study the overall macroeconomy and policies that affect it. Study the determinants of national income and long-run growth; causes and consequences of unemployment, inflation, and business cycle fluctuations; determination of foreign exchange rates and current account imbalances, and the role of government policy in various settings. Pre: 131 or instructor and economics undergraduate adviser consent. **DS**

ECON 301 Intermediate Economics: Price Theory (3) Course develops basic techniques and fundamental concepts of microeconomic theory. Learn to use economic reasoning to understand the social consequences of decisions made by individual consumers, producers, and governments. Analyze the nature of market outcomes under alternative market structures, and further discuss possible welfare-improving government policies when markets fail to be efficient. Special attention is paid to the analysis of strategic behavior and markets with public goods and externalities. Pre: 130 or instructor and economics undergraduate adviser consent. **FS**

ECON 311 The Economy of Hawai'i (3) History of development of Hawaiian economy; current economic problems. Pre: 120, 130, or 131; or consent. **DS**

ECON 317 The Japanese Economy (3) Analysis of Japan's growth past and present. Does Japan's economy look different in terms of its international trade structure, industrial structure, labor market, savings patterns, government policies, etc.? Does it matter? Pre: 120 or 130 or consent. **DS**

ECON 320 Introduction to Tourism Economics (3) This course examines tourism from an economic perspective. Topics include: the determinants of consumer demand for leisure travel, structure of competition among suppliers of tourism services, benefits and costs of tourism development to the host community, government's role in the taxation, subsidy, regulation and protection of the tourism industry, tourism's impact on the environment, and sustainable tourism development. A-F only. Pre: 120 or 130 or 131; consent. (Cross-listed as TIM 320)

ECON 321 Introduction to Statistics (3) Basic elements; descriptive statistics, probability, inference, distributions, hypothesis testing, regression, and correlation analysis. **DS**

ECON 340 Financial Markets & Institutions (3) The determination of asset prices; the risk and term structure of interest rates; efficient markets hypothesis; risk management and financial derivatives, asymmetric information models of financial market structure, innovation, regulation and deregulation; and financial crises. Pre: 120, 130, or 131; or consent. **DS**

ECON 356 Games and Economic Behavior (3) Course introduces students to the study of strategic behavior with applications to economics, business, and public policy. Simple economic models of strategic decision making are used to analyze provision of public goods; competition, cooperation, and coordination among firms; bargaining between employers and labor unions; international trade negotiations; reputation as a competitive advantage, and others. Pre: 120, 130, or 131; or consent.

ECON 358 Environmental Economics (3) Nature and causes of environmental degradation and economic solutions. Topics include air and water pollution, toxic waste, deforestation, soil erosion, biodiversity, global warming and sustainable economic growth. Pre: 120, 130, or 131; or consent. **DS**

ECON 361 Seminar: Women and International Development (3) Topics: Women's role, status, work and treatment in the Third World; Economic Development, changing work/family roles, and improvement/deterioration in gender equity across the Third World; global feminization of poverty; efforts to promote gender equity. Open to non-majors. Pre: A 100 level economics course or any women's studies course; or consent. (Cross-listed as WS 361)

ECON 362 The World Trading System (3) Political economy of the world trading system. Case studies of trade cooperation and conflict under the World Trade Organization and other institutions. Future challenges, including investment policies, environmental and labor standards. Pre: 120, 130 or 131; or consent.

ECON 390 Internship for Economics (V) Economics majors and minors work at paid positions with public agencies, private companies, and campus organizations. Students combine academic work with practical experience. Repeatable two times. Pre: consent.

ECON 391 Cooperative Education (V) Economics majors and minors, under the supervision of faculty members, work at paid positions with public agencies, private companies, and campus organizations. The Econ Cop integrates academics with practical work experience. Repeatable two times. Pre: consent.

ECON 399 Directed Reading (V) Economics majors and minors participate in faculty supervised reading of economic literature. Course enables students to self-study topics not covered in the department's scheduled course offerings. Repeatable one time. Pre: consent.

ECON 410 Economic Development (3) Characteristics of underdeveloped economies, theories of economic growth, strategies of economic development, and investment criteria. Pre: 300 and 301, or consent. **DS**

ECON 412 The U.S. Economy: Past and Present (3) U.S. economy from colonial times:

slavery, transportation, education, industrial concentration, regional and urban growth. Pre: 120, 130, or 131; or consent. **DS**

ECON 415 Asian Economic Development (3) History and economic development. Resources, population, and income, saving, investment, and consumption patterns. Role of government and private enterprise. Pre: 120, 130, or 131; or consent. **DS**

ECON 416 The Chinese Economy (3) The Chinese economy during the imperial and republican periods, under Mao, and into the present reform era, with a brief comparison to Taiwan and Hong Kong. Pre: 120, 130, or 131; or consent. **DS**

ECON 418 Pacific Island Economies (3) Historical and current economic development of the Pacific islands (excluding Hawai'i). Analysis of selected economic issues such as tourism, population growth, etc. Pre: 120, 130, or 131; or consent. **DS**

ECON 420 Mathematical Economics (3) Mathematical techniques applied to theories of the consumer, the firm, markets. Linear programming, input-output analysis. Pre: 300, 301, MATH 203, MATH 215, MATH 215A, MATH 241, or MATH 251A. **DS**

ECON 424 Introduction to Theory of Statistics (3) Descriptive statistics, probability theory, probability distributions, sampling, hypothesis testing, parameter estimations, bivariate regression, correlation analysis. Pre: MATH 203, MATH 215, MATH 215A, MATH 241, or MATH 251A. **DS**

ECON 425 Introduction to Econometrics (3) Regression analysis, analysis of variance, hypothesis testing, problems in estimation of single equation models, simultaneous equation models, problems and methods of estimation. Pre: 321, MATH 241, MATH 251A and NREM 203; or consent. **DS**

ECON 427 Economic Forecasting (3) Forecasting methods for business and economics with applications to the U.S., Asian, and Hawai'i economies. Topics include time series modeling of trend, seasonal, and cyclical components, multivariate regression modeling, and forecast evaluation. A-F only. Pre: 321 or NREM 203 or SOCS 225; or consent.

ECON 429 Computer Programming for Economic Research (3) Introduction to quantitative decision making methods for effective agribusiness management in resource allocation, scheduling, logistics, risk analysis, inventory, and forecasting. Emphasis on problem identification, model formulation and solution, and interpretation and presentation of results. A-F only. Pre: 130 and NREM 220, or consent. (Cross-listed as MBBE 342 and TPSS 342) **DS**.

ECON 430 Economics of Human Resources (3) Economic analysis of labor market. Investment in human capital, education, health, migration, etc. Pre: 301 or consent. **DS**

ECON 432 Economics of Population (3) Determinants and consequences of growth and structure of human populations. Relationships between economic factors and fertility, population growth and economic growth. Pre: 301 (or concurrent). (Cross-listed as PPST 432) **DS**

ECON 434 Health Economics (3) Private and public demand for health, health insurance, and

medical care; efficient production and utilization of services; models of hospital and physician behavior; optimal public policy. Pre: 301 or consent. **DS**

ECON 440 Monetary Theory and Policy (3) Microfoundations and critical analysis of monetary and macroeconomic theory and policy. Topics include the causes and consequences of inflation, optimal monetary policy and international monetary systems, bank risk and insurance, and national debt and taxation. Pre: 300 or 301 or consent. **DS**

ECON 450 Public Finance (3) Governmental expenditures, revenues, and debt. Fiscal policy, budgeting, and tax administration. Pre: 300 and 301. **DS**

ECON 452 State and Local Finance (3) Fiscal institutions, operations, and policy questions within state and local governments in U.S. grant programs and other links with central government. Pre: 301. **DS**

ECON 454 Economics and Cooperation (3) Economics is portrayed as the science of cooperation, thus highlighting the role of government as facilitator. The cooperative perspective is applied to such current issues as business management in Asia, global security, and international relations. Pre: 301. **DS**

ECON 458 Project Evaluation and Resource Management (3) Principles of project evaluation and policy analysis. Shadow pricing, economic cost of taxes and tariffs; public policy for exhaustible, renewable, and environmental resources. Pre: 301. (Cross-listed as NREM 458) **DS**

ECON 460 International Trade and Welfare (3) Theory of international specialization and exchange; general equilibrium, tariffs, quotas, common markets. Pre: 301. **DS**

ECON 461 International Monetary Economics (3) Theory of balance of payments, income, price level, and exchange rate determination; international capital movements, reserves, and current monetary problems. Pre: 300. **DS**

ECON 466 Growth and Crisis in the Global Economy (3) Sources of economic growth and technological change; growth experiences of selected countries since the industrial revolution; global economic cooperation; global business cycles and crises. Pre: 120, 130, or 131; or consent. **DS**

ECON 470 Industrial Organizations and Public Control of Business (3) Interrelations of firms within industries in the United States. Determinants of firm and industry size, pricing policies, profits, and growth. Effects of antitrust laws and regulatory laws. Pre: 301. **DS**

ECON 476 Law and Economics (3) Legal issues of property rights, contracts, torts, and crime. Efficiency of U.S. legal process. Economics of law enforcement, juries, prosecutors; evolution of legal rules. Pre: 301. **DS**

ECON 495 Land and Housing Economics (3) Microeconomics explains urban land and housing phenomena, and analyzes selected land and housing issues relevant to Honolulu. Pre: 301 and 321. (Cross-listed as PLAN 495) **DS**

ECON 496 Contemporary Economic Issues (3) Economic analysis of current events. Topics announced each semester, e.g., environmental pollution, crime control, racial discrimination, traffic congestion. Pre: consent. **DS**

ECON 499 Advanced Directed Research (V) Economics majors and minors conduct research, under faculty supervision, on a topic of their choice. Repeatable one time. A-F only. Pre: minimum GPA of 3.0 in economics and consent.

ECON 500 Master's Plan B/C Studies (1)

ECON 604 Microeconomics and Policy Analysis (3) Theory of the consumer, firm, and market. Role of governments and analysis of public policy. Applications to both industrialized and developing countries. Pre: consent.

ECON 605 Macroeconomics and Policy Analysis (3) Theories of income determination, prices, employment, and economic growth with emphasis on policy. Implications of interregional/international trade and financial linkages are explored. Pre: consent.

ECON 606 Microeconomic Theory I (3) Theory of the firm: production, costs, duality; theory of the market: competition, monopoly, oligopoly, monopolistic competition; theory of the consumer: preferences, expenditures, duality; expected utility theory. Pre: 627 and 628, or consent.

ECON 607 Macroeconomic Theory I (3) Neoclassical theory of real and monetary equilibrium, economics of J. M. Keynes, standard IS/LM models and aggregate demand/supply analysis in the closed and open economy, theory of rational expectations. Pre: 627 and 628, or consent.

ECON 608 Microeconomic Theory II (3) General equilibrium analysis: production, consumption and Walrasian equilibria; Pareto efficiency, fundamental theorems of welfare economics; externalities; public goods; game theory; information theory. Pre: 606 or consent.

ECON 609 Macroeconomic Theory II (3) Models of economic growth and fluctuations; stochastic and dynamic macroeconomic models; econometric testing of rational expectations models; theory of public debt; current topics in macroeconomic theory. Pre: 607 or consent.

ECON 610 Economic Development (3) Nature and causes of economic growth and structural change. Roles of macroeconomic policy and foreign trade. Pre: 606 and 607, or consent.

ECON 611 Economic Development Policy (3) Analysis of policies for the promotion of industrial and agricultural development. Project evaluation, industrial regulation, public administration, investment and capital market policies, land-use policies, trade policies, pricing, and stabilization. Pre: 604 or 606; or consent.

ECON 614 Economic Development of Japan (3) Analysis of growth from Meiji period to present. Problems of population change, capital formation, income distribution, industrial structure. Pre: 610 or consent.

ECON 616 Economic Development of China (3) Analysis of transition from a planned socialist economy (1949-78) to a market economy in China with a focus on changes in economic policies, foreign trade and investment, labor and financial markets, and the economic structure.

ECON 620 Microeconomic Theory III (3) Game theory and strategic behavior. Economics of information and incentives principal-agent theory. Economic design. Applications include:

theory of contracts; incentive compatible mechanism for provision of public goods; auction theory. Pre: 608; or consent.

ECON 627 Mathematics for Economics (3) Sets, functions, limits, convexity, continuity; constrained and unconstrained optimization; difference and differential equations; matrix algebra; simultaneous equations; comparative statics; Kuhn-Tucker theory; game theory; mathematical programming. Pre: MATH 203, MATH 215, MATH 241, or MATH 251A.

ECON 628 Econometrics I (3) Review of probability, estimation, small sample and asymptotic properties. Bivariate and multiple regression and matrix algebra formulation. Regression diagnostics. Introduction to heteroskedasticity, autocorrelation, simultaneity, dichotomous variables, advanced topics. Pre: NREM 310 or ECON 321, and MATH 241; or consent. Cross-listed as AREC 626

ECON 629 Econometrics II (3) Specification, statistical estimation, inference and forecasting of econometric models. Includes advanced topics for single-equation models, pooled models, qualitative dependent variables, simultaneous systems, distributed lags, and time series. Pre: 628, AREC 626 or consent. (Cross-listed as NREM 634)

ECON 637 Resource Economics (3) Analysis of problems of development and management of natural resources with emphasis on resources in agriculture and role in economic development. Pre: 608, 629 or AREC 634, and NREM 432; or consent. (Cross-listed as NREM 637)

ECON 638 Environmental Resource Economics (3) Principles of policy design and evaluation for environmental resources management, forestry and watershed conservation, and sustainable economic development. Pre: 604 or 606; or consent.

ECON 650 Theory of Public Finance—Expenditures (3) Microeconomic principles of public spending and policy analysis. Externalities, sustainability, public and common property goods, public choice, benefit-cost analysis, general-equilibrium analysis, rent-seeking, corruption, constitutional design, development policies, poverty alleviation, economic security, and new institutional economics. Pre: 604 or 606; or consent.

ECON 651 Theory of Public Finance—Revenue (3) Public and political economics approach to taxation and debt finance. Topics include incidence of taxation, optimal taxation, explicit and implicit debt financing, tax competition, behavioral public finance, and tax reforms. Pre: 606 or consent.

ECON 660 International Trade and Welfare (3) Advanced theory of international trade and welfare; international specialization and exchange, general equilibrium, tariffs, quotas, common markets; welfare implications. Pre: 608 (or concurrent); or consent.

ECON 662 International Macroeconomics (3) Advanced international monetary and macroeconomic theory: balance of payments, output, price and exchange rate determination, international aspects of growth and economic fluctuations, alternative exchange rate regimes, international capital flows. Pre: 605 or 607; or consent.

ECON 663 Trade Policy (3) Theory of international trade and welfare; tariffs; quotas; strategic trade policy; preferential trade areas; international trade agreements; foreign direct investment and multinationals. Pre: 604 or 606.

ECON 664 Applied International Finance (3) Surveys empirical research in international macroeconomics, finance and econometric methods: including balance of payments adjustment, international equilibrium, international prices, interest rates and exchange rates, models of exchange rate determination, capital flows, balance of payments crises. Pre: 607 and 629 (or concurrent) or consent. Fall only.

ECON 670 Labor Economics I (3) Supply of and demand for labor; implications for labor markets and unemployment level. Pre: 606 or consent.

ECON 671 Labor Economics II (3) Economics of human resources; human capital theory, allocation of time, poverty, and discrimination. Pre: 606 or consent.

ECON 672 Economics of Population (3) Economic determinants and consequences of population change. Pre: consent.

ECON 674 Health Economics and Policy (3) Economic analysis of health-care policy; efficient design of health-care financing schemes; private and public demand for health, health insurance, and medical care; provider behavior. Pre: 604 (or concurrent) or 606 (or concurrent), or consent.

ECON 680 Industrial Organization (3) Structure, performance, and conduct of business firms; determinants of firm and industry size, firm pricing policies, profits, and growth. Pre: graduate standing or consent.

ECON 686 Strategic Behavior and Experimental Economics (3) Experimental economics: methodology. Experimental game theory. Market experiments. Applications include: topics in industrial organization, provision of public goods, asset markets, auctions. Repeatable one time. Pre: 606 and 608; or consent.

ECON 699 Directed Research (V) Pre: consent of department chair.

ECON 700 Thesis Research (V) Research for master's thesis.

ECON 724 Seminar in Advanced Economics and Quantitative Methods (3) Open only to graduate students writing empirically oriented dissertations or proposals. Methods of empirical research. Repeatable. CR/NC only. Pre: 629 or AREC 634 and completion of all comprehensive examinations.

ECON 730 Research Seminar (3) Selected issues emphasizing research techniques. Required for students who have passed the two theory qualifying exams and have not passed the comprehensive exam. CR/NC only. Pre: consent.

ECON 731 MA Cooperative Research Seminar (3) Applied research methodology for economics MA students. Student groups choose a topic in consultation with instructor and design conceptual strategies, data collection approaches, and analysis techniques. A-F only. Pre: 604 and 605, or consent.

ECON 732 MA Capstone Research (3) Student applies theoretical and quantitative

techniques, critical thinking, and communicative skills to prepare a written and oral presentation of original research on a topic of his or her choice. A-F only. Pre: 420, 425, 604 (or concurrent), and 605 (or concurrent); or consent.

ECON 780 Seminar: Selected Topics in Economic Analysis (3) Topics not covered in other courses. Pre: 606, 607, or consent.

ECON 800 Dissertation Research (V) Research for doctoral dissertation.

EDCG

See Counseling and Guidance

EDCS

See Curriculum Studies

EDEA

See Educational Administration

EDEP

See Educational Psychology

Education (EDUC)

College of Education

EDUC 740 Field Project (V) Practicum experience in area of specialization. Variable credit: minimum of 3 credit hours, maximum of 6 credit hours. Repeatable. Pre: consent.

EDUC 799 Internship in College Teaching (V) Introduction to college-level teaching; doctoral students serve as apprentices to professors; responsibilities include supervised teaching, planning and evaluation. Repeatable. CR/NC only. Pre: admission to PhD candidacy and consent.

EDUC 800 Dissertation Research (V) Research for doctoral dissertation.

Educational Administration (EDEA)

College of Education

EDEA 360 Dynamics of Student Leadership (3) Theoretical approaches and an experimental orientation toward leadership in student organizations via classroom activities and practicum experiences with student organizations.

EDEA 460 Emergent Paradigms of Leadership (3) Exploration and application of advanced leadership concepts including emergent theories, issues, trends and empowering leadership. Supervised practicum experience in promoting leadership and organizational development required. Pre: 360 and consent.

EDEA 480 Organization and Administration of Schools (3) Principles and practices of school administration in relation to the function of the teacher. Special emphasis placed on Hawaii's state organization of public education and its laws and regulations.

EDEA 499 Directed Reading (V) Planned individualized study, reading, research, teaching, and/or projects under direct supervision of instructor. A-F only. Repeatable one time. Pre: consent.

EDEA 500 Master's Plan B/C Studies (1) Enrollment for degree completion. Pre: master's Plan B or C candidate and consent.

EDEA 581 (Alpha) Practicum in Educational Administration (1) In-service training for teachers and administrators in specific problem areas in the field of educational administration. Repeatable. CR/NC only. Pre: teaching experience and consent.

EDEA 582 (Alpha) Practicum in Educational Administration (2) Continuation of 581. Repeatable. CR/NC only. Pre: teaching experience and consent.

EDEA 601 Introduction to Education Administration (3) Develops view of administrative process and organization elements in context of system of personal, social, and physical variables. Emphasis on role and functions of school administrator.

EDEA 602 Research in Education Administration (3) Develops basic concepts of research on educational administration: methodology, status of particular topics, communication, and application of findings to problems of school administration. (Meets PhD common core inquiry methods requirement.)

EDEA 604 Qualitative Research Methods in Educational Organizations (3) Introduction to methods of qualitative research in educational administration. (Meets PhD common core requirement.)

EDEA 605 Collective Negotiation in Education (3) Principles and practices of collective negotiations as they apply to public and private education. Special emphasis placed on negotiation practices under Hawaii's public employee collective bargaining act.

EDEA 608 Survey Research Design and Analysis (3) Survey study designs, survey sampling, questionnaire construction, interviewing, pre-tests, pilot studies, logic of measurement and association, table construction, and elaboration models. Pre: consent. (Cross-listed as SOC 608)

EDEA 610 School-Community Relations (3) Application of principles, techniques, policies, organization of school-community information program.

EDEA 620 Education Finance (3) Educational revenues, apportionments, budgetary procedures, costs, business management, economics of education, measures of productivity.

EDEA 623 Administration in Kinesiology (3) Current problems, trends, and strategies in the administration of physical education, recreation, sport and fitness programs in school and non-school settings. Pre: KLS 423 or consent. (Cross-listed as KLS 623)

EDEA 629 Educational Statistics (3) Statistical inference including applications of parametric and nonparametric methods to educational problems. (Cross-listed as EDEP 629)

EDEA 630 Education Law (3) Status and functions of educational institutions and personnel relative to their legal rights and responsibilities. Includes interpretation of

important court decisions, statutes, equity measures.

EDEA 640 Systems Approach—Program Planning (3) Basic concepts and techniques in systems approach to educational management. Emphasizes preparation of program plans required at various organizational levels.

EDEA 642 Information Systems in Education (3) Integration of information systems and computer technology in educational planning, policy analysis, decision-making, and program assessment. Pre: ETEC 442 and consent.

EDEA 645 Principles of School Leadership (3) Examine the emergent theories, issues, practices, and problems relevant for educational leaders in school organizations. Integrates the aspects of management and administration within the context of leadership.

EDEA 646 American College Student (3) Study of psycho-social characteristics of the American college student and college environment, from viewpoint of student personnel work. (Cross-listed as EDCG 646)

EDEA 650 Human Factors in Organization (3) Analysis of the nature of organizations, human nature and needs, and their relationship to leadership, staffing, and staff development. Implications of group structure and human conflict, communications, and supervision and evaluation considered.

EDEA 652 Conflict Management in Education (3) Human factors in administration. Skills in the management of conflict in organizations; theories and practical application techniques. Pre: 601, 650, or consent.

EDEA 655 Intercultural Interactions (3) Theory-based frameworks and training methods of intercultural interaction and their applications to educational administration situations.

EDEA 657 Introduction to Higher Education (3) Salient historic, social, and organizational aspects of higher education; history, philosophy, purposes, governance, administration, structures, financing, faculty and student selection, curricula, legal and social issues. (Cross-listed as EDEF 657)

EDEA 660 Management/Leadership in Higher Education (3) Trends, research, and problems in college and university management. Pre: 657 or consent.

EDEA 661 Student Affairs Administration in Higher Education (3) Philosophy, history, organization, and administration of student personnel services at college and university levels, including admissions, housing, student activities, financial aids, placement, counseling, health services. Pre: 657 or consent.

EDEA 662 Curriculum in Higher Education (3) Traditional and contemporary curriculum issues. Development of performance competencies in curriculum design and evaluation using systems and design theory as central paradigms. Pre: 657 or consent.

EDEA 663 Community College Leadership (3) Development and changing missions of community colleges; in-depth study of emerging leadership issues: planning, financial management, decision-making, governance, and student personnel. Pre: 660 or consent.

EDEA 670 School Supervision (3) Principles of supervision, development of supervisory programs.

EDEA 675 Introduction to Educational Policy Studies (3) Examines theories and models of educational policy and policy making and the contribution of policy analysis to the policy-making and change processes. A-F only. Pre: consent. (Cross-listed as EDEF 675)

EDEA 676 The Politics of Education (3) Examination of the ways in which education can be viewed as political, arising from its connection to the larger political system including local, state, and federal governments. A-F only. Pre: 675, EDEF 675, or consent. (Cross-listed as EDEF 676)

EDEA 695 Plan B Master's Project (3) Independent study for students working on a Plan B Master's Project. A grade of Satisfactory (S) is assigned when the project is satisfactorily completed. Pre: graduate standing in EDEA or consent.

EDEA 699 Directed Reading and/or Research (V) Individual reading and/or research. Pre: consent of instructor and department chair.

EDEA 700 Thesis Research (V) Research master's thesis.

EDEA 704 Advanced Qualitative Research (3) Study in trends, research, and problems. Pre: 604 or comparable; or consent.

EDEA 720 Administrative Internship (V) Supervised intern experience in school and university administration. Emphasizes the development of leadership skills through program and project management. A-F only. Pre: approval of cooperating agencies and department.

EDEA 745 Creative Learning Strategies for Adults (3) Analysis of psychology of adult learner; forces that affect learning in dynamics of individual, group, and organizational behavior; concept of lifelong learning vis-a-vis development of creative strategies that assist maturing, self-directed persons to develop their potentialities. (Cross-listed as EDEP 745 and NURS 745)

EDEA 767 Seminar on the Educational System (3) Examination of structure and dynamics of the educational system. Particular focus on how educational policy interacts with principles that explain educational system behavior. A-F only. Pre: 675 or EDEF 675; or consent. (Cross-listed as EDEF 767)

EDEA 775 Seminar on the Principalsip (3) Series of planned seminar experiences on problems and issues confronting school principals, such as contract administration, program planning and budgeting systems (PPBS), teacher evaluation. Topic to be announced. Repeatable.

EDEA 780 (Alpha) Seminar (3) Study in trends, research, and problems. (B) policy formulation; (C) organizational change; (D) evaluation and research management (meets PhD common required advanced methodology course); (E) program management/PPBS; (F) curriculum administration; (G) school governance; (H) college student affairs administration; (I) higher education administration; (J) administrative theories; (K) administrative problems and issues; (M) facilities planning and management. Pre (for 780H): 646, 657, and 660. Pre (for all others): consent.

Educational Foundations (EDEF)*College of Education*

Current TB clearance is a requisite for all students taking courses requiring practicum experiences.

EDEF 201 Introduction to Teaching as a Career (3) An experience-based introduction to careers in education. Repeatable one time. (Cross-listed as EDEP 201)

EDEF 310 Education in American Society (3) Interrelated historical, philosophical, and socio-cultural contexts of education with an emphasis on contemporary problems and applications. Students enrolled in colleges other than the College of Education are asked to confer with the College of Education director of student services before enrolling in 310. A-F only. Pre: ITE 317 or ITE 402. **DS**

EDEF 360 Introduction to Multicultural Education (3) Concepts and methods to develop sensitivity and awareness of cultural influences on behavior as these relate to the schooling process. Field experience is an integral part of the course. (Cross-listed as ITE 360) **DS**

EDEF 399 Directed Reading (V) Individual reading or research. Pre: senior majors with a minimum cumulative GPA of 2.7 or a minimum GPA of 3.0 in education, and consent of instructor and department chair.

EDEF 408 Community and Culture (3) Theoretical and practical approaches to understanding the constitution of community life. A focus on the social construction of normative values, social dynamics of organizations, and school-community relations.

EDEF 445 Educational Sociology (3) Introduction to sociological frameworks of analysis of the institutional, cultural and social dynamics of schooling, classroom management, school reform, social group and individual role behavior. **DS**

EDEF 453 Gender Issues in Education (3) Examination of current and historical issues in education and how they are impacted upon by gender, with particular reference to gender as it intersects with ethnicity and class, locally and globally. Pre: WS 151 or junior standing, or consent. (Cross-listed as EDCS 453 and WS 453) **DS**

EDEF 469 Field Studies in Educational Foundations (V) Field-based analyses of educational problems and issues. Repeatable with different content. Pre: consent.

EDEF 470 Ethnic Groups and Education in Hawai'i (3) Identity and learning within and among Hawai'i ethnic groups; study of prejudice and inter-ethnic hostilities as these impact education and teaching. (Cross-listed as EDCG 470) **DS**

EDEF 480 Anthropological Applications (3) Education as cultural and cross-cultural learning; universal aspects of the process. Ethnographic study. Applied anthropological theory and practice for educators. (Cross-listed as ANTH 480D) **DS**

EDEF 500 Master's Plan B/C Studies (1) Enrollment for degree completion. Pre: master's Plan B or C candidate and consent.

EDEF 581 (Alpha) Practicum in Problems: School and Community (1) For in-service

school personnel to develop new approaches concerning how the school might relate more effectively to problems of a socio-political, ideological, moral, and/or multicultural nature. Repeatable with different content. CR/NC only. Pre: teaching experience or consent.

EDEF 582 (Alpha) Practicum in Problems: School and Community (2) For in-service school personnel to develop new approaches concerning how the school might relate more effectively to problems of a socio-political, ideological, moral, and/or multicultural nature. Repeatable with different content. CR/NC only. Pre: teaching experience or consent.

EDEF 583 (Alpha) Practicum in Problems: School and Community (3) For in-service school personnel to develop new approaches concerning how the school might relate more effectively to problems of a socio-political, ideological, moral, and/or multicultural nature. Repeatable with different content. CR/NC only. Pre: teaching experience or consent.

EDEF 610 Foundations of Educational Theory (3) An in-depth review of social, philosophical, and historical views underlying various theories of education and their applications in teaching and learning.

EDEF 630 Cultural Diversity and Education (3) Examines issues, theories, perspectives and practices in multicultural education and promotes awareness, encourages knowledgeable reflection and develops skills necessary for multicultural practitioners. A-F only. (Cross-listed as EDCS 630)

EDEF 650 Education in the Classical Tradition (3) Classical European, Chinese, Indic, and Islamic traditions in the history of education; emphasis on ways in which they shift, interact, and collide from the early modern period to the present.

EDEF 651 History of Education in America (3) History of educational thought and practice from European colonialism to revolutionary nationalism to the present.

EDEF 652 History of Education in Hawai'i (3) From pre-contact, ancient Hawai'i to the present. Social and intellectual influences on the development of national, local, and indigenous educational institutions; emphasis on multicultural as well as monocultural directions in Hawai'i's schools.

EDEF 657 Introduction to Higher Education (3) Salient historic, social, and organizational aspects of higher education; history, philosophy, purposes, governance, administration, structures, financing, faculty and student selection, curricula, legal and social issues. (Cross-listed as EDEA 657)

EDEF 660 Philosophy of Education (3) Readings of the original texts of major philosophers impacting American education. Considerations about the conditions of knowing and their extension in everyday practices in education.

EDEF 667 (Alpha) Seminar in Educational Foundations-Selected Topics (3) Multi-disciplinary (historical, philosophical, social/cultural and comparative/international focus on topical issues in education. (B) General; (C) Foundations of Leadership and Governance in Education; (D) Foundations of Educational Reform; (E) Foundations of Teaching; (F) Foundations of Curriculum; (G) Globalization

in Education. Pre: graduate standing and departmental approval.

EDEF 669 Introduction to Comparative/International Education (3) Introduction to basic methods of comparative studies, focusing on schooling, but also treating broader educational issues.

EDEF 671 Topics in Comparative Education (3) Educational institutions, structures, processes, policies, and problems viewed within the context of political, social, and cultural milieus. Geographic region or theme focus. Repeatable with different content. Pre: consent.

EDEF 675 Introduction to Educational Policy Studies (3) Examines theories and models of educational policy and policy making and the contribution of policy analysis to the policy-making and change processes. A-F only. Pre: consent. (Cross-listed as EDEA 675)

EDEF 676 The Politics of Education (3) Examination of the ways in which education can be viewed as political, arising from its connection to the larger political system including local, state, and federal governments. A-F only. Pre: 675, EDEA 675, or consent. (Cross-listed as EDEA 676)

EDEF 678 Approaches to Educational Inquiry (3) Overview of different research methods in educational inquiry with an opportunity to explore through practice one or more methods (ex: case study, interviewing, narrative construction, practitioner inquiry. Preparation for MEd or PhD proposals.

EDEF 683 Social and Cultural Contexts of Education (3) Focuses on the interplay of class, race, gender and ethnicity in school and community settings. Social praxis, educational reform and policy are considered.

EDEF 685 International Development Education (3) Introduction to international development education in Asian and Pacific nations. Students explore links between education and development. Emphasis is on cross-cultural perception of development.

EDEF 686 Environmental Education (3) Focus on environmental problems, such as pollution, resource depletion, and overpopulation, to develop programs of relevant education. Uses action projects in schools and community.

EDEF 699 Directed Reading and/or Research (V) Individual reading and/or research. Pre: consent of department chair.

EDEF 700 Thesis Research (V) Research for master's thesis.

EDEF 725 Education and Social Change (3) Study of classical and contemporary theories of social change as these relate to school, the profession of teaching, planning of change, and social stability. Pre: consent.

EDEF 751 Recent History of American Education (3) Contemporary American education in recent historical perspective; focuses on the educational changes brought about by WW II, the Cold War, civil rights and other social movements. Pre: consent.

EDEF 761 History of American Higher Education (3) Genesis and evolution of college and university from colonial America to present. Pre: consent.

EDEF 762 Seminar on the Social and Cultural Contexts of Education (3) Examina-

tion of social, political, and cultural issues affecting educational policy with special emphasis on methods of inquiry and theoretical constructs. Pre: consent.

EDEF 764 Advanced Seminar in Philosophy of Education (3) Advanced studies in philosophical inquiry. Examination of philosophically based methods of analysis and interpretation and their influence in educational research and practice. Pre: consent.

EDEF 766 Seminar in History of Education (3) Aspects of the history of education. Application of historiography to educational problems and policy. Repeatable with different content. Pre: one of 650, 651, 652, or 761; or consent.

EDEF 767 Seminar on the Educational System (3) Examination of the structure and dynamics of educational system. Particular focus on how educational policy interacts with principles that explain educational system behavior. A-F only. Pre: 675 or EDEA 675; or consent. (Cross-listed as EDEA 767)

EDEF 771 Seminar in Comparative/International Education (3) Advanced reading, research and writing in selected topics dealing with comparative and international education, including such themes as policy studies, minority education and educational reform. Pre: consent.

Educational Psychology (EDEP)

College of Education

EDEP 201 Introduction to Teaching as a Career (3) An experience-based introduction to teaching as a career. Repeatable one time. (Cross-listed as EDEF 201)

EDEP 303 Experiential Introduction to Humanistic Education (3) Participation in exercises designed to enable potential teachers to become more aware of themselves, especially as related to interaction in school settings. CR/NC only.

EDEP 311 Psychological Foundations (3) Principles of learning and individual differences; relationships of these factors to classroom experience. DS

EDEP 327 Self-Regulated Learning (3) Theory and use of self-regulated learning strategies in academic contexts.

EDEP 399 Directed Reading (V) Individual reading or research. Pre: consent.

EDEP 408 Fundamentals of Research in Education (3) Introduction to the methodology of systematic study of problems in education: principles of research design, data processing, technical writing, and evaluation of research proposals and reports. DS

EDEP 411 Seminar in Contemporary Perspectives in Educational Psychology (3) In-depth analysis of contemporary issues in education from the theoretical and methodological perspectives of the faculty in educational psychology. Repeatable one time. Pre: 303, 311, or consent. DS

EDEP 416 Student Assessment (3) Development and analysis of assessment procedures in educational settings.

EDEP 429 Introductory Statistics (3) Use of descriptive statistics in analyzing test scores; application of linear correlation and regression; introduction to an understanding of inferential statistics. DS

EDEP 432 Human Motivation and Education (3) Application of motivation theory and research to understanding and increasing human motivation for education.

EDEP 500 Master's Plan B/C Studies (1) Enrollment for degree completion. Pre: master's Plan B or C candidate and consent.

EDEP 509 Cooperative Learning (2) Introduction to theories underlying cooperative learning and experience with various cooperative learning methods from both student's and teacher's perspectives. CR/NC only.

EDEP 510 Topics in Cooperative Learning (2) Educators who have studied and are implementing cooperative learning are provided opportunities to jointly reflect on their experiences in the context of relevant theory.

EDEP 601 Introduction to Quantitative Methods (3) Introduction to quantitative methods in behavioral sciences. Review of elementary statistical methods. Introduction to general linear model as principle of data analysis. (Meets EdD common inquiry methods requirement or elective.) Pre: 429 or consent. (Cross-listed as PSY 610 and SW 651)

EDEP 602 Computer Analysis of Data (3) The analysis and interpretation of behavioral science data using common statistical software packages. (Cross-listed as SW 652)

EDEP 603 Design and Analysis of Psychological Experiments (3) Analysis of variance and other modes of assessing results of experiments. Relation of analysis to design. Pre: 601, PSY 610, or SW 652; or consent. (Cross-listed as PSY 611 and SW 653)

EDEP 604 Multiple Regression in Behavioral Research (3) Advanced application of general linear model to complex problems of data analysis. Relation of analysis of variance and co-variance to regression analysis. Non-linearity and treatment of missing data. Pre: 601 and 602, or consent. (Cross-listed as PSY 612 and SW 654)

EDEP 605 Factor Analysis (3) Theory and method of factor analysis and related methods of multivariate analysis. (Cross-listed as PSY 613 and SW 655)

EDEP 606 Multivariate Methods (3) Multivariate forms of multiple linear regression, analysis of variance and co-variance. Multiple discriminant analysis, canonical correlation, and principal-components analysis. Pre: 603 and 604, or consent. (Cross-listed as PSY 614 and SW 656)

EDEP 607 Nonparametric Methods for Behavioral Science (3) Conditions for valid applications of nonparametric statistical techniques in education and behavioral sciences; theoretical and methodological perspectives. (Cross-listed as PSY 615 and SW 657)

EDEP 608 Introduction to Educational Research (3) Fundamental design and evaluation procedures in educational research. Determining needs, defining objectives, research design, instrumentation, data collection, and evaluation. (Meets EdD common inquiry methods requirement or elective.)

EDEP 611 Inquiry Approach to Educational Psychology (3) Foundations of educational psychology through the vehicle of an exploratory study. Inquiry approach stresses learning theory, measurement techniques, and research skills in education.

EDEP 612 Statistical Power in Behavioral Research (3) Theory and techniques of power analysis for significance testing of means, proportions, correlations or variances, estimation of effect size, and necessary sample size.

EDEP 616 Measurement and Evaluation (3) Theory of measurement and evaluation; analysis of tests and scales emphasizing statistical and psychological analysis of experimental and standardized tests and scales. (Cross-listed as PSY 616 and SW 658)

EDEP 626 Scaling: Measurement of Attitude and Perception (3) Theory and methods of major unidimensional and multidimensional scaling techniques. Examples from education, sociology, and psychology. (Cross-listed as PSY 617)

EDEP 629 Educational Statistics (3) Statistical inference including applications of parametric and nonparametric methods to educational problems. (Cross-listed as EDEA 629)

EDEP 631 Adolescence and Education (3) Discussion-based course presenting an overview of educational psychology applied to teaching adolescents, including theory and research on human learning, adolescent development and its social context, and student assessment.

EDEP 661 Development and Learning (3) Analysis and critique of (Piagetian) developmental stage theory and traditional behavioristic and cognitive learning theories; introduction to current models of learning and development. Pre: consent.

EDEP 662 Social Context of Learning (3) Research methods and theories relating social mediation and learning group structures to intellectual growth.

EDEP 663 Models of Cognitive Learning (3) Cognitive models of knowledge acquisition, organization, and utilization; theory and research relating learning and cognition to interactive instructional models.

EDEP 664 Instructional Psychology (3) Application of learning theory and cognitive skills training in instructional settings.

EDEP 665 Social Cognition and Competence (3) Systematic analysis of social reasoning abilities conjunctive with or prerequisite to effective social interaction in educational settings.

EDEP 695 Plan B Master's Project (3) Independent study for students working on a Plan B Master's Project. A grade of Satisfactory (S) is assigned when the project is satisfactorily completed. Pre: graduate standing in EDEP.

EDEP 699 Directed Reading and/or Research (V) Individual reading and/or research. Pre: consent.

EDEP 700 Thesis Research (V) Research for master's thesis.

EDEP 708 Educational Research Methods (3) Research techniques and thesis development.

EDEP 711 Practicum in Educational Psychology (V) Supervised practicum in teaching or program evaluation as each is

reflected by professional activities of the members of the faculty. Pre: consent of supervisory professor.

EDEP 745 Creative Learning Strategies for Adults (3) Analysis of psychology of adult learner; forces that affect learning in dynamics of individual, group, and organizational behavior; concept of lifelong learning vis-à-vis development of creative strategies that assist maturing, self-directed persons to develop their potentialities. (Cross-listed as EDEA 745 and NURS 745)

EDEP 768 (Alpha) Seminar in Educational Psychology (3) Current issues and problems in the context of education: (B) General; (C) Learning; (D) Measurement; (E) Statistics; (F) Psycho-social development; (G) Educational evaluation; (H) Research methodology. Pre: consent. Seminar may be repeated for credit as topics vary.

EDEP 800 Dissertation Research (V) Research for doctoral dissertation.

Educational Technology (ETEC)

College of Education

ETEC 414 Educational Media Technology (3) Introduction to theories, application of principles, acquisition of practical skills of educational media relevant to teaching/learning situation, in classroom as well as non-school settings. Includes "mainstreaming" components for assisting mildly handicapped learners. Pre: upper division standing.

ETEC 415 Technology for Teachers (3) Introduction to the application of educational technology in teaching and learning using strategies in design, selection, development, integration, and evaluation. Interactive delivery via distance education technologies. A-F only. Pre: basic teaching certification.

ETEC 430 Video Technology (3) Use of video techniques for purposes of instruction, documentation, and training. Planning, production, simple editing procedures, and utilization in educational context.

ETEC 442 Computers in Education (3) Overview of basic components of computer systems and their application to instruction and administration. Various operating systems will be explored.

ETEC 448 Links to Lifelong Learning (3) Focused exploration of the internet and its application to effective classroom teaching/learning, including finding, evaluating, using, creating information; design, construction, and posting of Web page. Integration with copyright law, ergonomics, national and Hawai'i standards. Repeatable one time. Pre: 442 or consent.

ETEC 454 Technology Resources (3) Virtual and hands-on analysis of technology resources and utilization in K-12 schools. Repeatable one time. Pre: 442 or consent.

ETEC 499 Directed Activity (V) Individual work, supervised by instructor. May consist of reading, research, and/or projects. Pre: consent.

ETEC 500 Master's Plan B/C Studies (1) Enrollment for degree completion. Pre: master's Plan B candidate and consent.

ETEC 501 Professional Development in Educational Technology: Technology Skills for Educators (1) Exploring technology resources needed for distance learning and classroom integration.

ETEC 502 PDET: Technology Skills for Educators (2) Exploring technology resources needed for integration into classroom instruction. Repeatable one time. CR/NC only.

ETEC 511 Professional Development Education Technology I (3) Specialized topics reflecting interests and needs of faculty in current issues of technology integration. Combined lecture, lab and discussion course. Repeatable one time. Pre: consent.

ETEC 512 Professional Development Education Technology II (3) Specialized topics reflecting interests and needs of faculty in current issues of technology integration. Combined lecture, lab and discussion course. Repeatable one time. Pre: consent.

ETEC 513 Professional Development Education Technology III (3) Specialized topics reflecting interests and needs of faculty in current issues of technology integration. Combined lecture, lab and discussion course. Repeatable one time. Pre: consent.

ETEC 514 Professional Development Education Technology IV (3) Specialized topics reflecting interests and needs of faculty in current issues of technology integration. Combined lecture, lab and discussion course. Repeatable one time. Pre: consent.

ETEC 600 Theory and Practice in Educational Technology (3) The profession of educational technology and the role of instructional designers. Theoretical and philosophical foundations underlying practice that include instructional systems theory, needs assessment, change theory, and relevant learning models. Practical applications of these theories to solve instructional problems in real-life settings. A-F only. Pre: ETEC majors or consent.

ETEC 601 Ed Tech Research Review (3) Review of existing research in media/ed technology, with activities leading to the preparation of final study or project proposal. Repeatable one time. A-F only. Pre: ETEC major or consent.

ETEC 602 Teaching/Training Technologies (3) Innovative technological advances for use in teaching and training, and their evaluation in terms of instructional goals. A-F only. Pre: consent.

ETEC 603 Instructional Design and Development (3) Basic concepts and techniques of instructional design and development, for application to solving instructional problems in real-life situations. A-F only.

ETEC 605 Conducting Ed Tech Research (3) Application of methodological and statistical concepts to students' own research projects. Formative and summative evaluation, measurements, descriptive and inferential statistics. A-F only. Pre: ETEC major.

ETEC 620 Visual Design (3) Theory and practice involved in planning and producing instructional graphic material for desktop publishing and computer-based presentation. A-F only.

ETEC 630 Video/TV Design (3) Development and utilization of television programs for the purpose of improving the teaching-learning process. A-F only. Pre: consent.

ETEC 644 Programming Concepts/Structures (3) Concepts and structures of microcomputer instruction; laboratory experience. Pre: 442 or consent.

ETEC 645 Design Web-based Instruction (3) The design and development of instruction for Web and internet delivery. Integration of HTML, Java, and current Web authoring software will be employed to create instructional Web sites. Repeatable one time. A-F only. Pre: consent.

ETEC 647 Hypermedia Design (3) The utilization and application of computer interactive systems including the use of advanced authoring tools, combining unique advantages of video, motion, imagery, and sound with current instructional processes in student-centered learning. Repeatable one time. A-F only. Pre: consent.

ETEC 648 (Alpha) Computer Authoring (3) Conceptualization of instructional design and its application to the development of particular types of software, utilization or environment: (B) assisted instruction (CAI); (C) managed instruction; (D) virtual reality; (E) animation. Repeatable one time. A-F only. Pre: consent.

ETEC 649 Development of Online Courseware (3) Planning, design, and development of online instruction for educational and training settings. Implementation of online course elements such as student interaction, course management, testing, and content delivery using an authoring environment such as Web Course Tools or equivalent. Repeatable one time. A-F only. Pre: consent.

ETEC 650 Instructional Technology Services Management (3) Applying theory of management in instructional technology support services and delivery systems. Pre: consent.

ETEC 661 Distance Education Technology (3) Technical and instructional considerations for developing, delivering, managing, and evaluating distance education including voice, video, and data transmission techniques. Interactive delivery over Hawai'i Interactive Television System. Repeatable one time. Pre: consent.

ETEC 662 Computer Networks in Education (3) Design, installation, and management of computer networks for administrative and instructional uses, with particular focus on local area network issues. Pre: consent.

ETEC 663 Planning for Technology and Resources (3) Planning, needs assessment, and change theory applied to the development and evaluation of long-range plans and the communication of a vision for technology in education. Pre: consent.

ETEC 664 Technology and Instructional Applications (3) Evaluating products; planning for professional development; designing for and applying in-service training in: instructional design, teacher presentations, direction of student productions, and facilitating computer-managed instruction. Pre: consent.