EE 442 Digital Communications (3) Baseband transmission, intersymbol interference and pulse shaping, partial response signaling, equalization, bandpass modulation and demodulation, channel coding, synchronization, multiplexing, and multiple access, spread spectrum techniques. Pre: 341 and 342; or consent.

EE 446 Information Theory and Coding (3) Models of communication systems. Channel noise, measurement, and coding of information. Intrinsic limits of performance of communication systems. Pre: 341 and 342; or consent.

EE 449 Computer Communication Networks (3) ISO Reference Model, Physical Layer, Data Link Layer protocols, local- and wide-area networks, routing, congestion and flow control, higher layer protocols, network design, ISDN, performance evaluation, high-speed networks. Pre: 315 and one of EE 342, MATH 371, or MATH 471; or consent.

EE 452 Digital Control Systems (3) Sampling/reconstruction, Z-transform, DT transfer function, Reachability/observability. State and output feedback, observer design, input-output models, diophantine equations. Implementation procedures. Pre: 315 and 351, or consent.

EE 453 Modern Control Theory (3) Analysis and synthesis of nonlinear control systems by means of Lagrange’s equation, state space techniques, maximum principle: Lyapunov’s theorems, the phase plane, and Z-transform techniques. Optimization and adaptation by means of gradient methods, calculus of variations, dynamic programming. Pre: 351.

EE 455 Design of Intelligent Robots (3) Study of the design principles of computer-controlled, intelligent robots such as roving vehicles, hand-eye systems. Pre: 351 and 367.

EE 460 Switching Circuit Theory (3) Threshold logic circuits, iterative combinational logic circuits, sequential circuits analysis and synthesis, minimization, state assignment, hazards, race conditions, fault-detection experiments, linear sequential circuits. Pre: 120 or 361.

EE 461 Computer Architecture (3) Structure of stored program machines, data flow machines, pipelining, fault-tolerant computing, instruction set design, effects of compilation on architecture, RISC vs. CISC architecture, uses of parallelism. Pre: 361.

EE 466 VLSI Design (3) Design, simulation, and fabrication of digital VLSI systems using field-programmable logic devices. Pre: 323 and 361.

EE 467 Object-oriented Software Engineering (3) Introduction and advanced techniques for designing, implementing, and testing computer software with a particular focus on using object-oriented design, analysis, and programming to produce high-quality computer programs that solve non-trivial problems. Pre: 367 or consent.

EE 468 Introduction to Operating Systems (3) Computer system organization; multiprocessor systems, memory hierarchies, assemblers, compilers, operating systems, virtual machine, memory management, processor management; information management. Pre: 260 and 367; or consent.

EE 473 Microwave Communications (3) Microwave amplifiers and oscillators, solid-state microwave devices, antennas, radio propagation as applied to a microwave communication system. Pre: 372.


EE 475 Optical Communications (3) Principles and applications of optical fibers and waveguides. Fundamentals of optical communication systems (optical links, high-speed systems, wavelength division-multiplexing networks, and network elements) and optical components (guided-wave circuits, lasers, detectors, and optical amplifiers). System and network integration issues. Repeatable once. A–F only. Pre: 371 or consent.


EE 480 Introduction to Biomedical and Clinical Engineering (3) Application of engineering principles and technology to biological and medical problems. Introduction to human anatomy, physiology, medical terminology, clinical measurements. Systems modeling, physiological control systems, computer applications, health-related problems. Pre: 213 and MATH 232.

EE 480L Biomedical Engineering Lab (1) (1 Lec, 1 3-hr Lab) Measurement of bioelectrical signals, computer and electronic simulation of biological systems, and design and evaluation of electronic circuits for biomedical measurements, evaluation of instruments for patient safety. Pre: 323 and 323L. Co-requisite: 480.


EE 482 Biomedical Instrumentation (3) (2 Lec, 1 3-hr Lab) Principles, applications, and design of biomedical instrumentation. Transducers, IC and microcomputer applications, patient safety. Pre: 326, 480; or consent.

EE 491 (Alpha) Special Topics in Electrical Engineering (3) Course content will reflect special interests of visiting/permanent faculty; to be oriented toward juniors and seniors. (B) artificial intelligence; (C) circuits; (D) communications; (E) computer hardware; (F) computer software; (G) computer vision; (H) control; (I) devices; (J) fields; (K) power. Pre: consent.

EE 494 Provisional Topics (3) Upper division course with subject matter to be announced.

EE 496 Senior Design Project (V) Investigation of advanced engineering problems. Pre: senior.

EE 499 Directed Reading (V) Investigation of advanced engineering problems. Pre: senior standing and consent.

EE 500 Master’s Plan B/C Studies (1)

EE 601 Graph Theory and Its Applications (3) Graphs and subgraphs, trees and treelike graphs, planar graphs, connectivity and edge-connectivity, applications. Pre: MATH 311 or consent.

EE 602 Algorithm I (3) Design and evaluation of machine representations, techniques and algorithms for sorting, pattern processing, computational geometry, mathematical computations, and engineering applications. Introduction to computational issues of time, space, communication, and program correctness. Pre: 367 or consent.

EE 603 Algorithm II (3) Techniques of parallel and distributed computation. Design and analysis of computational structures and algorithms based on general models of computer architecture. Issues in interprocessor communication and synchronization. Pre: 602, 660, or consent.

EE 604 Artificial Intelligence (3) Lisp for machine intelligence applications, or related constraint object and logic-oriented languages. Pre: 467 or knowledge of Lisp/PROLOG.

EE 606 Machine Processing of Natural Languages I (3) Review of computer language syntax analysis, natural language as a knowledge-based process, grammars and parsing, transition and augmented transition grammars, feature and function grammars, natural language parsing. Pre: 367 and knowledge of Lisp.

EE 615 Advanced Digital Signal Processing (3) An advanced course in digital processing. Topics include fast DFT algorithms, multirate systems and filter banks, power spectrum estimation, linear prediction, optimum linear filters, and adaptive filtering. A–F only. Open to non-majors for CR/NC only. Pre: 415 or 640 or consent.


EE 621 Advanced Solid-State Devices (3) Advanced physical principles and design of modern solid-state electronic devices. Heterostructures, photodetectors, LED, junction lasers, and other devices of current importance identified from the current literature. Pre: 327.

EE 622 Optical Electronics I (3) Optical electronics including light-guiding, optical resonators, lasers, and applications. Pre: 327 or consent.

EE 623 Optical Electronics II (3) Electro-optics, noise detection, light and sound dielectric waveguide phenomena, lasers, optics, phase conjugation. Pre: 622 or consent.

EE 624 Micrometers and Microactuators I (3) Technology methods and physical principles of microsensors and microactuators. Vacuum technology, thin film deposition and characterization techniques, solid mechanics, micromachining, acoustics, piezoelectricity and principles of current micromotors. Pre: 327 or consent.
EE 625 High-Frequency Solid-State Devices
(3) High-frequency semiconductor devices. Hot electrons, Gunn oscillators, IMPATT diodes, MESFETs, modulators, microelectromechanical klystrons, TWTA's, magnetrons, resonant tunneling devices, superlattice. Pre: 327. or consent.

EE 626 Microsensors and Microactuators II
(3) Survey of current microsensors and microactuators; pressure sensors; accelerometers; thermal, chemical, and magnetic sensors; micromotors and transducers. Pre: 624 or consent.

EE 627 Advanced Topics in Physical Electronics
(3) Recent developments in phenomena and devices of physical electronics. Pre: 327.

EE 628 Analysis and Design of Integrated Circuits

EE 631 Advanced Power Systems
(3) Computer-aided analysis and design of large power systems: modeling, system protection, economic operation, short-circuit analysis, load-flow studies, and transient stability of N-machine systems. Pre: 331 and 455, or consent.

EE 633 Power Generation and Control
(3) Power generation. Power exchange of interconnected areas, control of generation, simulation models and optimum control, power system security, state estimation. Pre: 351, 435, 436 or consent.

EE 640 Applied Random Processes
(3) Random variables, multivariate distributions, random sequences, stochastic convergence, stationary and nonstationary processes, spectral analysis, Karhunen-Loeve expansion, Markov processes, mean square estimation, Kalman filters. Pre: MATH 471 or equivalent.

EE 641 Queuing Theory
(3) Poisson, Markov, and renewal processes, M/G/1 queue, G/M/1 queue, queueing networks, simulation, and performance evaluation of computer systems and communication networks. Pre: 342, 640 (or concurrent), or consent.

EE 642 Detection and Estimation Theory
(3) Fundamentals of signal detection and estimation theory. Hypothesis testing, parametric and nonparametric detection, sequential detection, parametric estimation, linear estimation, robust detection and estimation, and applications to communication systems. Pre: 640.

EE 643 Communication System Performance
(3) Fundamental performance limits, signal detection and estimation, modulation, intersymbol interference, equalization adaptive filtering, sequence detection, synchronization, fading multipath channels, spread spectrum. Pre: 640.

EE 644 Computer Communication Networks
(3) Fundamentals of computer communication networks including modeling, performance evaluation, routing, flow control, local area networks, distributed algorithms, and optimization algorithms. Pre: 342, MATH 471, or consent.

EE 645 Neural Nets and Learning Theory

EE 646 Advanced Information Theory
(3) Measure of information, coding for discrete sources, discrete memoryless channels and capacity, the noisy channel coding theorem, source coding with fidelity criterion, rate-distortion theory, multiuser channels. Pre: 640.

EE 647 Source Coding
(3) Theory and applications of source coding, rate-distortion theory, companding, lattice coding, tree coding, trellis coding, entropy-constrained coding, asymptotic theory, predictive and differential encoding, combined source/channel coding, vector quantization. Pre: 640.

EE 648 Error-Control Coding I
(3) Linear block codes, soft and hard decision decodings, correction of random errors, cyclic codes, BCH codes, Reed-Solomon codes, majority logic decodable codes, burst-error correcting codes, concatenated codes. Pre: MATH 311 or consent.

EE 649 Error-Control Coding II
(3) Convolutional codes, Viterbi algorithm, sequential decoding, coded modulation, multistage decoding, concatenated coded modulation, coding for fading channels, error-control systems. Pre: 648.

EE 650 Linear System Theory
(3) State space theory of linear systems, controllability, observability, stability, irreducible realizations. Pre: 452.

EE 651 Nonlinear Control Systems

EE 652 Optimal Control Systems
(3) Optimal controls introduced through parametric optimization, calculus of variations, Euler-Lagrange and Hamilton-Jacobi equations, Pontryagin's maximum principle, minimum-time and minimum-fuel problems, dynamic programming, applications. Pre: 650 or consent.

EE 655 Robust Control
(3) Multivariable frequency response design, signals and systems, linear fractional transformations, LQG Control, Full Information H-infinity Controller Synthesis, H-infinity filtering, model reduction, the four-block problem. Pre: 453 and 650.

EE 660 Computer Architecture I

EE 661 Computer Architecture II
(3) Design principles and techniques for architecture of parallel processing computers, processors, memories, interprocessor communication mechanism, multiprocessor scheduling and synchronization. Pre: 660 or consent.

EE 665 Computer Systems
(3) Modern operating system software, process communication, distributed systems, device drivers. Software development and maintenance, integration of software packages. Projects reflecting special interests of faculty. Pre: 461 and 468.

EE 668 Telecommunication Networks
(3) Telecommunication-network architecture; switching, broadcast, and wireless networks; protocols, interfaces, routing, flow- and congestion-control techniques; intelligent network architecture; service creation capabilities; multimedia, voice, data, and video networks and services. Pre: 468 or consent.

EE 671 Electromagnetic Theory and Applications
(3) Formalism of Maxwell's equations and applications to radiation and propagation of electromagnetic waves. Pre: 372 and MATH 402.

EE 673 Advanced Microwave Electronics

EE 680 Biomedical Engineering Systems
(3) Systems analysis and electronic instrumentation methods in biomedicine. Network and control-loop modeling, computer simulation, biological transducers, and analysis of electronic and physiological systems. Pre: 326, 326L, and 571, or consent.

EE 691 Seminar in Electrical Engineering
(1) CR/NC only. Pre: graduate standing and consent.

EE 692 Seminar in Electrical Engineering
(1) CR/NC only. Pre: graduate standing and consent.

EE 693 (Alpha) Special Topics in Electrical Engineering
(3) Course content will reflect special interests of visiting/permanent faculty. (B) artificial intelligence; (C) circuits; (D) communications; (E) computer hardware; (F) computer software; (G) computer vision; (H) control; (I) devices; (J) fields; (K) power. Pre: 699 Directed Reading or Research (V) CR/NC only. Pre: graduate standing and consent.

EE 700 Thesis Research (V)

EE 790 Directed Instruction (V)
Student assists in undergraduate classroom and/or project instruction under direction and close supervision of faculty member. CR/NC only. Pre: admission to PhD candidacy.

EE 800 Dissertation Research (V)
Research for doctoral dissertation. Pre: candidacy for PhD in electrical engineering.

ENBI
See Environmental Biochemistry

Engineering (ENGR)

College of Engineering
Preference in registration is given to declared engineering majors. Please consult the current Schedule of Courses for confirmed offerings each semester.

ENGR 100 Engineering Freshman Practicum
(1) Practicum sessions to integrate course material from engineering learning community courses and apply it to engineering problems. Repeatable once. CR/NC only. Open to College of Engineering learning community students only. Co-requisite: EE 160, MATH 206, and PHYS 170.

For key to symbols and abbreviations, see the first page of this section.
ENGR 250 Personal Development for Effective Teams (3) Exploration and application of basic leadership theories and processes which foster personal and interpersonal development via cognitive experiential classroom methods and mentoring relationships with experienced peer leaders.

ENGR 401 Engineering Management (3) Introduction to engineering management with emphasis on development of skills for professional advancement. Repeatable once.

ENGR 493 Field Experience (1) Supervised internship in engineering practice under professional and faculty direction. Repeatable once. Pre: junior standing in engineering and consent.

English (ENG)

College of Languages, Linguistics and Literature

ENG 100 Expository Writing (3) Practice in writing clear, effective university-level prose. Attention to all stages of the process—generating ideas, drafting, revising, and editing. Pre: placement exam. WR

ENG 101 Expository Writing (3) Practice in writing clear, effective university-level prose. Attention to all stages of process—generating ideas, drafting, revising, and editing. Supplemental tutorial laboratory required. Pre: placement exam. Corequisite: 101L. WR

ENG 109 Expository Writing II (3) Continuation of 100 for students who need further practice at the introductory level. Emphasis on analysis and revision. Pre: 100 and consent.

ENG 200, 209, and 225 are courses in intermediate expository writing.

ENG 200 Intermediate Expository Writing (3) Continued work in prose writing. Practice in inventing, organizing, and communicating more complex theses and analyses. Pre: 100 or 109 with a grade of C or better.

ENG 209 Business Writing (3) Practice in informative, analytical, persuasive writing. Pre: 100.

ENG 225 Technical Writing (3) Combined lecture/lab course preparing students to write about technical subjects for specialists and laypersons. Introduces theory of technical communication and document design and teaches students to make use of relevant technology. A-F only. Pre: 100.

Courses ENG 250–257 are applicable toward the "arts and humanities" core requirements. Credits are not considered "beyond the introductory level."

ENG 250 American Literature (3) Major American authors from beginnings to present. Requires a minimum of 3,000 words of writing. Pre: 100. AH3

ENG 251 British Literature to 1800 (3) Major authors from Old English, Medieval, Renaissance, and Neoclassical periods. Requires a minimum of 3,000 words of writing. Pre: 100. AH3

ENG 252 British Literature after 1800 (3) Major authors from Romantic, Victorian, Modern periods. Requires a minimum of 3,000 words of writing. Pre: 100. AH3

ENG 253 World Literature to 1600 (3) Major Eastern and Western authors from Classical, Medieval, and Renaissance periods. Requires a minimum of 3,000 words of writing. Pre: 100. AH3

ENG 254 World Literature after 1600 (3) Major Eastern and Western authors from the time of the European Enlightenment to the modern period. Requires a minimum of 3,000 words of writing. Pre: 100. AH3

ENG 255 Short Story and Novel (3) Introduction to prose fiction through major texts. Requires a minimum of 3,000 words of writing. Pre: 100. AH3

ENG 256 Poetry and Drama (3) Introduction to poetry and drama through major texts. Requires a minimum of 3,000 words of writing. Pre: 100. AH3

ENG 257 (Alpha) Themes in Literature (3) Selected themes in major works of various types, cultures, periods. Requires a minimum of 3,000 words of writing. Repeatable once only. (257Y cross-listed as WS 257) AH3

ENG 257A (Alpha) Themes in Literature (3) Selected themes in major works of various types, cultures, periods. Requires a minimum of 3,000 words of writing. Co-requisite: 100 and Honors standing. AH3

ENG 311 Autobiographical Writing (3) Writing clear, effective prose based on the writer's own experiences and ideas. Pre: 100 and one of 250–257.

ENG 313 Types of Creative Writing (3) Basic principles applied through writing in two major genres (short story and poetry, short story and drama, or poetry and drama). Pre: 100 and one of 250–257. AH1

ENG 315 Advanced Expository Writing (3) Writing essays emphasizing logical and rhetorical principles: organization, clarity, coherence, style. Pre: grade of B or better in 100, 109, or 200.

Fulfillment of the college's written communication requirement and two semesters of 250–257 are prerequisite to upper division English courses numbered 320 or above. A few courses have different or additional prerequisites as listed below:

ENG 320 Introduction to the English Language (3) Uses of language in speech and in writing; diversity of modern English. Problems of dialects, style, usage, "correctness"; nature of standard English. AH3

ENG 325 Rhetoric, Composition and Computers (3) Introduction to computer-based writing and reading technologies. Study of principles of traditional and online composition. Writing traditional and multimedia essays. Pre: 100 and one course from 250–257, or consent.

ENG 331 Understanding Poetry (3) Analysis of imagery, sound, language, form, and structure of poems, for increased appreciation of poetry. AH3

ENG 335 Backgrounds of Western Literature (3) Sources of European and American literary themes and allusions; myth, legend, and folklore of Western cultures; e.g., Classical texts, Arthurian romances, King James Bible. AH3

ENG 336 Critical Approaches to Literature (3) Analysis of poetry, prose, and drama from a variety of perspectives; e.g., romantic, new critical, structuralist, Marxist, feminist.

ENG 351 English Literary History to 1660 (3) Readings in representative authors and works; development of literary ideas and forms.

ENG 352 English Literary History 1660–1900 (3) Readings in representative authors and works; development of literary ideas and forms.

ENG 361 (Alpha) Literature and Other Arts and Humanities (3) Not applicable to college or major requirements. Pre: one of 250–257.

ENG 362 (Alpha) Literature and Professions and Sciences (3) Not applicable to college or major requirements. Pre: one of 250–257.

ENG 363 (Alpha) Literature and Popular Culture (3) Not applicable to college or major requirements. Pre: one of 250–257.

ENG 364 (Alpha) Topics, Genres and Authors (3) Not applicable to college or major requirements. Pre: one of 250–257.

ENG 370 Ethnic Literature of Hawai‘i (3) Writings of various ethnic groups in Hawai‘i, ancient to contemporary. Songs, stories, poetry, fiction, essays that illustrate the social history of Hawai‘i. Pre: one social science core course. (Cross-listed as ES 370)

ENG 371 American Literature to 1865 (3) Prose and poetry to the Civil War; e.g., Bradstreet, Emerson, Thoreau, Poe, Hawthorne, Melville, Dickinson. Pre: one of 250–257 or consent.

ENG 372 American Literature, 1865 to Present (3) Prose, poetry, and drama after the Civil War; e.g., Whitman, James, Wharton, Frost, Stevens, O’Neill, Faulkner, Baldwin. Pre: one of 250–257; or consent.

ENG 393 Junior Honors Program in English (3) Tutorials in English and American literature. Consult departmental honors adviser for particulars. Repeatable. Pre: enrollment in Honors Program or consent.

ENG 394 Junior Honors Program in English (3) Continuation of 393. Repeatable. Pre: enrollment in Honors Program or consent.

ENG 401 Modern English Grammar (3) Structure of contemporary English; current theories of grammar; relation between grammar and style.

ENG 402 History of the English Language (3) Origin and evolution of English language to c.1800, particularly as manifested in literary texts.

ENG 403 English in Hawai‘i (3) English language in Hawai‘i, viewed historically and in a multicultural context, with attention to politics, religion, race, and education, from 1820 to the present. Pre: two courses from 250–257 or consent.

For key to symbols and abbreviations, see the first page of this section.
ENG 410 Form and Theory of Poetry (3)
Poetic theories and techniques for students interested in writing poetry. Pre: 313 or consent.

ENG 411 Poetry Workshop (3)
Writing, evaluating poems. Repeatable once. Pre: 410 or consent.

ENG 412 Nonfiction Writing (3)
Workshop analysis of nonfiction as a literary form. Repeatable. Pre: 313 or 315, or consent.

ENG 413 Form and Theory of Fiction (3)
Narrative techniques for students interested in writing fiction. Pre: 313 or consent.

ENG 414 Fiction Workshop (3)
Writing, evaluating fiction. Repeatable once. Pre: 413 or consent.

ENG 415 Professional Editing (3)
Discussion and practice in the professional editing of articles, reports, books; logic, clarity, coherence, consistency of tone and style, grammar and punctuation. Pre: 315 or consent.

ENG 416 (Alpha) Studies in Creative Writing (3)
Workshop on special topics in creative writing. Pre: 313 or consent.

ENG 417 Argumentative Writing (3)
Advanced work in the theory and practice of argument; emphasis on the role of invention in argumentative discourse and on the nature of rhetorical proof. Pre: 315.

ENG 421 English Drama to 1662 (3)
From Medieval through Renaissance, excluding Shakespeare; e.g., Marlowe, Webster, Jonson.

ENG 425 Writing for Electronic Media (3)
Combined lecture/lab course on writing and rhetoric in computer-mediated communication. May include online technical writing, coursework development, hypertext fiction. A-F only. Pre: two of 250–257 and 325; or consent.

ENG 431 The Rise of the British Novel (3)
The 18th- and early 19th-century novelists; e.g., Richardson, Fielding, Sterne, Austen, Scott.

ENG 432 The Victorian Novel (3)
Nineteenth-century novelists; e.g., Dickens, the Brontës, George Eliot, Hardy.

ENG 433 The Modern British Novel (3)
Twentieth-century novelists; e.g., Conrad, Joyce, Lawrence, Woolf.

ENG 435 Literary Studies in the Bible (3)
Narrative, generic, and stylistic forms in the Bible in English. Related writings may be considered in comparative analysis.

ENG 436 The Rhetorical Tradition (3)
History of theory and practices of rhetoric from Classical to contemporary period; e.g., Plato, Aristotle, Cicero, Quintilian, Augustine, Sidney, K. Burke, DeMan. Pre: 335 or 336.

ENG 437 Classics of Literary Criticism (3)
Survey of chief critical writings from Greek to modern times; e.g., Plato, Aristotle, Sidney, Johnson, Arnold, Eliot, Barthes, Derrida, Foucault, Kristeva.

ENG 438 Prosody (3)
Reading and writing in traditional poetic forms—sonnet, villanelle, sestina, rondel, pantoum, etc.—for theoretical and practical appreciation of formal poetry. Pre: 331 or 410, or consent.

ENG 439 (Alpha) Topics in Film (3)
Specific topics in such areas as major filmmakers, genres, themes, film theory and criticism. (B) film genres; (C) film theory and criticism; (D) film and literature; (E) major filmmakers. Repeatable once only.

ENG 442 Chaucer (3)
Chaucer’s art from early poems to Troilus and Criseyde and The Canterbury Tales.

ENG 445 Early Shakespeare (3)
Critical study of selected plays: early comedies and histories through major comedies.

ENG 446 Later Shakespeare (3)
Critical study of selected plays: Hamlet and other major tragedies through late romances.

ENG 447 Milton (3)
Selected poetry and prose, including Paradise Lost.

ENG 451 Medieval English Literature (3)
Representative Old and Middle English poetry, prose, exclusive of Chaucer, chiefly in translation; e.g., Beowulf, Pearl, Morte d’Arthur. Continental backgrounds.

ENG 453 16th-Century English Literature (3)
Tudor poetry and prose, exclusive of drama; e.g., More, Wyatt, Surrey, Sidney, Shakespeare. Special concentrations. Repeatable once only. Pre: 313 or 315; and 413, 412, or 410; or consent.

ENG 457 Restoration and Early 18th-Century Literature (3)
Drama, poetry, and prose, 1660–1744, exclusive of Milton; e.g., Dryden, Pope, Swift, the satiric mode.

ENG 458 Later 18th-Century English Literature (3)
Drama, poetry, and prose, exclusive of novel; e.g., Johnson, Boswell, Goldsmith.

ENG 461 English Literature of the Romantic Period (3)
Poetry and prose from 1780 to 1832, exclusive of novel; e.g., Coleridge, Wordsworth, Keats, Hazlitt, Lamb.

ENG 463 Victorian Literature (3)
British poetry and prose, 1832–1914, exclusive of novel; e.g., Tennyson, Arnold, Browning, Swinburne, Hardy, Hopkins.

ENG 469 (Alpha) Studies in British Literature (3)
One or two major authors, an individual genre, or a special topic. Repeatable once only.

ENG 475 The American Novel to 1900 (3)
Development of prose fiction from early Republic through end of 19th century; e.g., Hawthorne, Melville, Twain, James.

ENG 476 20th-Century American Novel (3)
The achievement of American prose fiction from Dreiser to contemporaries such as Pynchon, Bellow, Morrison.

ENG 478 Asian American Literature (3)
Prose, poetry, and drama by Asian American writers from a variety of backgrounds, e.g., Japanese American, Chinese American, Korean American, Filipino American. Pre: two courses from ENG 250–257 (or concurrent) or consent.

ENG 479 (Alpha) Studies in American Literature (3)
One or two major authors, an individual genre, or a special topic. Repeatable once only.

ENG 480 Literature of the Pacific (3)
The literature of the Pacific and Pacific voyagers with special reference to contemporary writings in English by Pacific Islanders. Pre: two of 250–257, or consent. (Cross-listed with PACS 480)

ENG 481 World Literature in English (3)
Colonial, post-colonial, and commonwealth literatures in English, from regions such as Africa, India, the Pacific, and the Caribbean.

ENG 482 Narratives of Oral Tradition (3)
Prose folktale; ballad and related poetry; epic; folklore-literary relationships.

ENG 483 Modern Drama (3)
Major European and American dramatists from 1880 to present; e.g., Ibsen, Chekhov, Shaw, O’Neill, Brecht, Beckett.

ENG 485 Children’s Classics (3)
Children’s literature from 17th-century folk and fairy tales to contemporary poetry and fiction; history of children’s book illustration.

ENG 487 20th-Century British and American Poetry (3)
Major poets from the moderns through the contemporaries; e.g., Yeats, Pound, Eliot, Stevens, Lowell, Bishop, Roethke, Merwin.

ENG 488 Contemporary British and American Literature (3)
British and American drama, poetry, and prose since 1945.

ENG 489 (Alpha) Studies in Comparative Literature (3)
A genre, theme, tradition, etc., in two or more literatures. Repeatable once only. (ENG 489F cross-listed as WS 489; ENG 489U) cross-listed as EALL 472)

ENG 490 Theory of Teaching Composition (3)
Theory, observation, and practice in teaching writing, especially the use of one-on-one and small group instruction. Recommended: 315.

ENG 491 Senior Honors Tutorial (3)
Studies in history of ideas, periods, or themes in English and American literature. Repeatable. Pre: enrollment in Honors Program or consent.

ENG 492 Senior Honors Tutorial (3)
Continuation of 491. Repeatable.

ENG 495 Internship (3)
Faculty supervised participation in the operations of an organization. A-F only. Pre: two of 250–257; junior standing.

ENG 496 Senior Seminar (3)
Intensive study in a major period, genre, or movement. Emphasis in field of special interest. Major research paper. Repeatable once only. Pre: 335 or 336, 351, 352, and one area course; or consent.

ENG 499 Directed Reading (V) Repeatable once. A-F only. Pre: two of 250–257 or consent.

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

ENG 560 HWP Summer Writing Institute (3)
ENGL 561 HWP Summer Institute WAC (V)
Practicum in the current best approaches to teaching writing across the curriculum. Participants write, read published theory and research in composition, and demonstrate effective writing lessons. Repeatable.

ENG 611 (Alpha) Graduate Writing Workshop (3)
Advanced practice and critical evaluation of the writing of poetry, fiction, or creative nonfiction. (B) poetry; (C) fiction; (D) nonfiction. Repeatable. Pre: 411 for (B); 414 for (C); 412 for (D).

ENG 620 The Profession of English (3)
Introduction to the professional study of English and the four concentrations in the MA program. Required of all candidates for the MA in English. Fall only.
ENG 633 (Alpha) Theories and Methods (3)
Required course in the MA student’s area of concentration: (B) theories and methods of literary study; (C) introduction to composition and rhetoric; (D) foundations of creative writing; (E) theories in cultural studies. Repeatable in different alphas. Pre: 620 or equivalent, or consent. Spring only.

ENG 637 (Alpha) Literary Theory and Criticism (3) (B) classical period through 18th century; (C) Romantic and post-Romantic.

ENG 639 Film Theory and Criticism (3)
Classic theories of representation and aesthetics; modern and contemporary cultural, psychoanalytic, and aesthetic theories as they apply to film. A–F only. Pre: graduate standing or consent.

ENG 640 Old English (3) Structure of the language, relation to present English; reading of selected prose and poetry. Pre: consent.

ENG 660 (Alpha) Major Authors (3) Study of one or more authors, English or American. Repeatable. Pre: 620 and graduate standing; or consent.

ENG 675 (Alpha) Literary Genres and Problems (3) Study of one area of English or American literature. Repeatable. Pre: 620 or consent.

ENG 680 Theory and Practice of Teaching Composition (3) Major contemporary theorists and classroom practices that evolve from their theories; observation and applications. Pre: 315 or 412; or consent.

ENG 691 MA Final Project (V) Individual reading and research towards preparation of MA project. 3 cr.; audit hours required. Repeatable. Pre: 620, 653 (or concurrent), or consent.

ENG 699 Directed Reading (V) Individual reading or research. Pre: consent.

ENG 700 Thesis Research (V) Pre: consent.

ENG 711 Seminar in Creative Writing (3) Advanced study in creative writing focused on thesis and dissertation projects. Repeatable once. Pre: 611 or consent.

ENG 716 (Alpha) Techniques in Contemporary Literature (3) The study, from the point of view of the creative writer, of works written within the last 25 years. (B) techniques in fiction; (C) techniques in poetry; (D) techniques in creative nonfiction. Repeatable. Pre: 611 (or concurrent) or consent.

ENG 730 Advanced Literary Research (3) Assumptions, methods, and definition of a literary field. Required of all doctoral candidates writing a critical/scholarly dissertation or a dissertation with a creative emphasis. Pre: 633 or equivalent and PhD candidacy.

ENG 735 (Alpha) Seminar in Comparative Literature (3) Introduction to comparative literature; relationship of English to other literatures; sources and influences. Repeatable. Pre: 620 (or concurrent) or consent.

ENG 737 Problems in Literary Criticism (3) Intensive study of selected topics in literary theory and its practical application; topics to be announced. Repeatable. Pre: 620 or consent.

ENG 740 Seminar in Composition Studies (3) Intensive study of selected issues in composition studies. Repeatable. Pre: 633C (or concurrent), or consent.

ENG 745 Seminar in English Language (3) Intensive study of one topic in English linguistics. Pre: consent.

ENG 751 Seminar in Life Writing (3) Intensive study of critical and theoretical issues raised by various forms of life writing (biography, autobiography, oral history, diaries, etc.) and of their history and methodology. A–F only. Repeatable once. Pre: 620 or consent.


ENG 760 Seminar in Rhetoric (3) Intensive study of selected topics in the history of rhetoric, rhetorical theory, or rhetorical criticism; topic to be announced. Repeatable. Pre: 633C or consent.

ENG 765 Seminar in Cultural Studies in Asia/Pacific (3) Intensive study of selected issues in cultural studies in Asia and the Pacific; topics to be announced. A–F only. Repeatable once. Pre: 620 or consent.

ENG 766 Issues in Cultural Studies (3) Intensive study of selected issues in cultural studies and cultural and social theory; topics to be announced. A–F only. Repeatable once. Pre: 653E or consent.

ENG 775 (Alpha) Seminar in English Literature (3) Study of authors or a period. Pre: consent.

ENG 780 (Alpha) Seminar in American Literature (3) Study of authors or a period. Repeatable. Pre: 620 (or concurrent), and a 400-level course in American literature; or consent.

ENG 785 Special Topics in Literature (3) Consent to be announced. Repeatable. Pre: 620 or consent.

ENG 800 Dissertation Research (V) Pre: consent.

ENG 801 Seminar in Shakespeare (3) Intensive study of selected topics in Shakespearean literature and performance. Pre: consent.

English as a Second Language (ESL)
College of Languages, Linguistics and Literature Initial placement in ESL 100 is by examination only. Courses below: 300 are not applicable toward the MA in English as a second language.

ESL 100 Expository Writing: A Guided Approach (3) Extensive practice in writing expository essays; linguistic devices that make an essay effective. (Fulfills composition requirement for nonnative speakers of English only.) WR

ESL 111 Practicum for Foreign T.A.’s (3) Extensive practice for foreign teaching assistants in speaking in classroom situations with an emphasis on oral skills, American cultural expectations, and classroom management. Pre: ELI 080.

ESL 302 Second Language Learning (3) Theoretical foundations for the learning and teaching of second/foreign languages. Pre: upper division standing.

ESL 303 Second Language Teaching (3) Survey of methodology; basic concepts and practices. Pre: 302.

ESL 312 Techniques in Second Language Teaching: Reading and Writing (3) Methods and materials. Issues in teaching; survey of available materials and practice in their adaptation. Pre: 302.


ESL 380 Bilingual Education (3) Survey and analysis of current thinking and practices in bilingual/bicultural education; special emphasis on ESL/EFL. Pre: 302, graduate standing, or consent.

ESL 418 Instructional Media (3) Theoretical foundation and practical applications of using electronic and audiovisual media in second language teaching. Pre: 305 or graduate standing; or consent.

ESL 430 Pidgin and Creole English in Hawai‘i (3) Major historical descriptive, pedagogical aspects; pidgin and creole languages, linguistic change, language variation. Work with actual language data. Laboratory work required. Pre: 302 and LING 102, or graduate standing; or consent. AH3

ESL 441 Language Concepts for Second Language Learning and Teaching (3) Language analysis—phonology, syntax, semantics, discourse for teaching second languages. Pre: one of 302, LING 102, LING 320, or graduate standing; or consent.

ESL 460 English Phonology (3) Basic course in English phonetics and phonology; emphasis on areas of interest to language teachers. Pre: 302.

ESL 490 Second Language Testing (3) Measurement and evaluation of achievement and proficiency in second language learning. Pre: 302, 441, LING 102, or graduate standing.

ESL 499 Directed Reading/Research (V) For liberal studies majors. Pre: a minimum cumulative GPA of 2.7 or a minimum GPA of 3.0 in major, or consent of department chair.

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

ESL 520 Topics in Second Language Teaching (V) Approaches and methodology in teaching second languages; research in second language acquisition and sociolinguistics. Repeatable three times. CR/NC only. Pre: teaching certificate.

ESL 600 Introduction to Second Language Studies (3) Introduction to basic professional and research issues in second language studies; integration of theory, research, and practice for prospective ESL teachers and researchers. Pre: graduate standing or consent.

ESL 612 Alternative Approaches to Second Language Teaching (3) Examination, comparison with conventional approaches; interpersonal relationships in language teaching. Pre: 600 or consent.

ESL 613 Second Language Listening and Speaking (3) Key issues; overview and critique of published materials; practice in developing syllabi and other materials. Pre: 600 or consent.
second language research methodology (Pre: 670 or consent); (U) second language use (Pre: 660). Repeatable if different alpha.

ESL 690 ESL Teaching Practicum (3) Student teaching in ESL classroom. Pre: 600, 610, advancement to candidacy, and consent.

ESL 699 Directed Reading/Research (V) Individual reading in various fields of ESL. CR/NC only. Pre: consent of department chair and instructor.

ESL 700 Thesis Research (V) Thesis research for Plan A students.

ESL 710 Teaching Second Languages (3) Analysis of methods; implications of recent and current research. A-F only. Pre: 650 and 660; or consent.

ESL 730 Seminar in Second Language Education (3) Current issues and problems. Repeatable. Pre: 600 and advancement to candidacy; or consent.

ESL 750 Seminar in Second Language Acquisition (3) Issues in theory and research in second language acquisition of child and adult. Repeatable. Pre: 441 and 460; or consent.


ESL 775 Seminar in Second Language Qualitative Research: Methods (3) Methodology of qualitative research in second language and multilingual contexts; data collection and analysis; ethics and style in research reporting. Pre: 675 or consent.

ESL 799 Apprenticeship in Teaching (V) An experienced-based introduction to college-level teaching; doctoral students serve as student teachers to professors; responsibilities include supervised teaching, and participation in planning and evaluation. Repeatable. CR/NC only. Pre: graduate standing and consent.


ESL 620 Second Language Reading (3) Survey of research in reading process; teaching methodology; psycholinguistic investigations; comparison of reading in first and second languages. Pre: 600 or consent.

ESL 630 Second Language Program Development (3) Designing, implementing, and evaluating language programs; systems-based approach to program and curriculum development. Pre: 600 or consent.

ESL 640 English Syntax (3) English clause structure in relation to second language learning and teaching. Pre: 441 and 600 (or concurrent), or consent.

ESL 642 Comparative Grammar and Second Language Acquisition (3) Comparative study of structures of two or more languages; native speaking informants used. Consideration of language transfer in second language learning, role of typological features. Pre: 441, 460, or ENG 401.

ESL 650 Second Language Acquisition (3) Theory and research. A-F only. Pre: 490 and 600; or consent.

ESL 660 Sociolinguistics and Second Languages (3) Theoretical and practical aspects of language, culture, and society. A-F only. Pre: 600 or consent.

ESL 670 Second Language Quantitative Research (3) Quantitative research methods; design of research studies; techniques in collecting data; statistical inference; and analysis and interpretation of data. Pre: 490, 600, and graduate standing; or consent.

ESL 671 Research in Language Testing (3) Advanced issues in language testing research including recent developments in the following areas: language testing hypotheses, item analysis, reliability, dependability, and validity. Pre: 490 or consent.

ESL 672 Second Language Classroom Research (3) Survey of research on second language classrooms and analysis of methodological issues. Pre: 600.

ESL 673 Applied Psycholinguistics and Second Language Acquisition (3) Theory and research in psycholinguistics as related to second language acquisition, production, acquisition, and instruction. Pre: 441 or LING 422, and 600; or consent.

ESL 675 Second Language Interpretative Qualitative Research (3) Philosophical and theoretical aspects of second language interpretative qualitative research. Pre: 600 and 660 (or concurrent); or consent.

ESL 678 Microanalysis in Second Language Research (3) Discourse analysis and verbal report as qualitative approaches to second language research; their theories and methodologies; practical application. Pre: 600 or consent.

ESL 680 (Alpha) Topics in Second Language Acquisition (3) Variable topics in special areas of second language studies: (E) second language learning (Pre: 650); (N) second language analysis (Pre: 640); (P) second language pedagogy (Pre: 600 or consent); (R)

ESL 692 Directed Reading/Research (V) Individual reading in various fields of ESL. CR/NC only. Pre: consent of department chair and instructor.

ESL 700 Thesis Research (V) Thesis research for Plan A students.

ESL 710 Teaching Second Languages (3) Analysis of methods; implications of recent and current research. A-F only. Pre: 650 and 660; or consent.

ESL 730 Seminar in Second Language Education (3) Current issues and problems. Repeatable. Pre: 600 and advancement to candidacy; or consent.

ESL 750 Seminar in Second Language Acquisition (3) Issues in theory and research in second language acquisition of child and adult. Repeatable. Pre: 441 and 460; or consent.


ESL 775 Seminar in Second Language Qualitative Research: Methods (3) Methodology of qualitative research in second language and multilingual contexts; data collection and analysis; ethics and style in research reporting. Pre: 675 or consent.

ESL 799 Apprenticeship in Teaching (V) An experienced-based introduction to college-level teaching; doctoral students serve as student teachers to professors; responsibilities include supervised teaching, and participation in planning and evaluation. Repeatable. CR/NC only. Pre: graduate standing and consent.

ELI 070 Listening Comprehension I (0) Intensive work in understanding lectures, taking lecture notes, writing examinations, and study skills. Language laboratory required.

ELI 072 Reading for Foreign Students (0) Instruction and practice in improving reading comprehension and speed, and in use of textbooks and reference materials. Work on study skills; individual conferences and tutoring.

ELI 073 Writing for Foreign Students (0) Extensive practice in expository writing. Analysis and use of rhetorical devices. Individual conferences and tutoring as required.

ELI 080 Listening Comprehension II (0) Further practice: development of classroom discussion skills. Language laboratory required. Pre: 070 or placement by examination.

ELI 082 Advanced ESL Reading (0) Advanced ESL study skills and extensive reading strategies; focus on vocabulary and reading in student’s major. Pre: 072 or placement by examination.

ELI 083 Writing for Foreign Graduate Students (0) Individual instruction in specific writing problems: term papers, reports, projects. Foreign graduate students only except by permission. Pre: 073 or placement by examination.

ENGR

See Engineering

Entomology (ENTO)

College of Tropical Agriculture and Human Resources

ENTO 250 The World of Insects (3) Biology/ecology of insects with emphasis on relationships to plants, animals, and especially people in Hawai‘i and the tropics.

ENTO 263 General Entomology (4) (3 Lec, 1 3-hr Lab) Biology, ecology, habits, structure of Hawai‘i’s insects/arthropods. Classification to family level. Pre: ZOOL 101, BOT 101, or consent.

ENTO 374 Economic Entomology (3) Destructive and beneficial insects; principles of cultural, mechanical, legislative, biological, and chemical control. Pre: 263, CHEM 151, and CHEM 152; or consent.

ENTO 374L Economic Entomology Lab (1) (1 3-hr Lab) Studies with Hawaiian insect pests of households, plants, and animals. Pre: 374 (or concurrent) or consent.


ENTO 463 Urban Entomology (3) (2 Lec, 1 3-hr Lab) Biology, ecology, and management of insects associated with people, structures, and the urban environment in Hawai‘i and North America. Pre: 263 (or concurrent); or consent. (Alt. years: spring)

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

ENTO 492 Internship (4) Integration and application of academic knowledge and critical skills emphasizing professional development. Placement with an approved cooperating supervisor/employer. Required of undergraduate students in entomology. Pre: consent. (Cross-listed as AGRS 492 and HORT 492)

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

ENTO 633 Insect Genetics (3) (2 Lec, 1 3-hr Lab) Genetic analysis, manipulation and control of insect populations. Pre: BIOL 172, BOT 101, GENE 451, or ZOOL 101.
Environmental Biochemistry (ENBI)
College of Tropical Agriculture and Human Resources
ENBI 152 Survey of Organic and Bioorganic Chemistry (3) Structure, nomenclature, properties, reactions of organic compounds; emphasis on those of practical importance in related fields. Open to nonmajors. Pre: CHEM 151, CHEM 171, or CHEM 170. (Cross-listed as CHEM 152) NS2
ENBI 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: BIOL 270, BIOL 270L, CHEM 272, and CHEM 273; or consent. (Cross-listed as BIOL 402)
ENBI 402L Principles of Biochemistry Lab (2) (1 Lec, 1 3-hr Lab) Pre: 402 (or concurrent).
ENBI 412 Environmental Biochemistry (3) Biochemical and chemical principles of occurrence, distribution, biotic and abiotic conversion, fate, and impact of synthetic and natural molecules in the environment. Pre: CHEM 272 and CHEM 162 or 171; or consent.
ENBI 420 Hazardous Materials (3) Introduction to state and federal environmental regulations relative to hazardous substances. Pre: CHEM 151 (or concurrent) or consent. (Cross-listed as PH 420 and GEOG 420)
ENBI 491 Topics in Environmental Biochemistry (V) Study and discussions of significant topics and problems. Offered by visiting faculty and/or for extension programs. Repeatable.
ENBI 499 Directed Reading and/or Research Experience (V) Pre: consent.
ENBI 604 Survey of Environmental Toxicology of Pesticides (1) Current research findings on use, dissipation and analysis of pesticides; environmental aspects; pesticide regulation and legislation. Pre: consent.
ENBI 610 Plant Biochemistry (3) Comprehensive study of chemical constituents and biochemical processes unique to plant kingdom with emphasis upon selected aspects of current interest. Pre: 402L consent. (Cross-listed as MPM 620)
ENBI 681 Pesticide Toxicology (3) Principles of toxicology; chemical and biochemical mechanisms of pesticide toxicity. Pre: ENBI 402 or BIOC 411; CHEM 272; or consent. (Cross-listed as ENTO 681)
ENBI 687 Advanced Lab Techniques (1) (2 Lec, 1 3-hr Lab) Advanced laboratory techniques used in food science and human nutrition research. Pre: 402, 402L, and FSHN 477; or BIOC 441 and BIOC 411L; or consent. (Cross-listed as ANSC 687 and FSHN 687)
ENBI 699 Directed Research (V) Pre: consent.

Ethnic Studies (ES)
College of Social Sciences
ES 101 Introduction to Ethnic Studies (3) Basic concepts and theories for analyzing dynamics of ethnic group experiences, particularly those represented in Hawai'i, and their relation to colonization, immigration, problems of identity, racism, and social class. SS 221 Hawaiians (3) Relationship between changes in Hawaiian lifestyle and development of Hawaiian economy; land use and tenure; participation in government, labor, and industry; Hawaiian institutions; "Hawaiian movement."

COURSES: ENTOMOLOGY--ETHNIC STUDIES 307

For key to symbols and abbreviations, see the first page of this section.
ES 338 The Original American: Indians (3)
Overview of American Indian history and traditions. Impact of European contact and conquest; contemporary issues of resistance and survival. Pre: one social sciences core course.

ES 340 Land Tenure and Use in Hawai’i (3)
Dynamics of change: indigenous Hawaiian land tenure; Great Mahele and Kuleana Act; ethnic succession of land ownership; concentration of ownership today; effects of land development on ethnic communities. Pre: one social sciences core course.

ES 348 Teaching Ethnic Studies in Higher Education (3)
Strategies for teaching subject matter in university, college, and community college settings; pedagogical concepts, models, classroom techniques, case studies. Pre: two ES courses at the 100, 200 or 300 level; or consent.

ES 350 Economic Change and Hawai’i’s People (3)
Development of modern Hawaiian economy and impact on Hawai’i’s people. Sugar, pineapple, and tourism industries; role of local and multinational corporations; scenarios for Hawai’i’s future development. Pre: one social sciences core course.

ES 360 Immigration to Hawai’i (3)
Historical overview: "push and pull factors"; effect of changing economy: experiences of various ethnic groups; problems of recent immigrants; immigration policies in the United States and Hawai’i. Pre: one social sciences core course.

ES 365 Pacific/Asian Women in Hawai’i (3)
Adaptive strategies of Hawaiian, Chinese, Japanese, Korean, Filipino, Samoan, and Southeast Asian women in Hawai’i; feminist anthropological and historical analysis. Pre: one ANTH, SOC, or WS course. (Cross-listed as WS 360) SS

ES 370 Ethnic Literature of Hawai’i (3)
Writings of various ethnic groups in Hawai’i, ancient to contemporary. Songs, stories, poetry, fiction, essays that illustrate the social history of Hawai’i. Pre: one social sciences core course and consent. (Cross-listed as ENGL 370)

ES 380 Fieldwork in Ethnic Studies (V)
Specialized supervision of individual student research projects in historical, oral history, or contemporary problems. Repeatable to total of 6 credit hours. Pre: consent.

ES 381 Social Movements in Hawai’i (3)
Role of various contemporary movements for social change in Hawai’i: community, ethnic, labor, student, etc. Theories of social movements and social change. Pre: one social sciences core course.

ES 392 Change in the Pacific—Polynesia (3)
Impact of cultural and physical change and their interrelationship. Pre: IS or social sciences courses.

ES 399 Directed Reading/Research (V)
Repeatable to total of 6 credit hours. Pre: consent only.

ES 410 Race, Class, and the Law (3)
Historical context and implications of landmark court decisions and legal issues affecting social change in ethnic communities in Hawai’i and the Continental United States. Pre: one 300-level course in ethnic studies, political science, or sociology.

ES 420 African American Ethnic Relations: Politics and Economy (3)
Relationship between race and class in the United States, focusing upon ethnic conflict, changing economic structures, and the role of the modern state. Pre: one 300-level ethnic studies course.

ES 430 Plantation Studies Seminar (3)
An interdisciplinary inquiry into the Hawaiian plantation experience; topics include women and the family, ethnic relations, environment, work, etc. Pre: junior standing or consent. (Cross-listed as AMST 416)

ES 455 (Alpha) Topics in Comparative Ethnic Conflict (3)
Causes and dynamics of ethnic conflicts with attention to problem resolution. (B) Middle East; (C) Hawaiian sovereignty in Pacific context. Repeatable. Pre: 320 or 392, or consent for (C).

ES 492 Politics of Multiculturalism (3)
The development of ethnic relations and political approaches to multiculturalism in two multiethnic nations: Canada and the United States. Pre: one social sciences core course, an ES 300-level course, or consent.

ES 493 Oral History: Theory and Practice (3)
Literature and methodology; project design. Students develop and execute an oral history project. Pre: upper division standing; and HIST 151 and HIST 152, or HIST 281 and HIST 282; or consent.

ES 495 Hawaiian Labor History (3)
Conditions of work under varying political, social, and economic transformations in Hawai’i; anthropological, sociological, and historic data. Pre: HIST 151 and HIST 152.

European Languages (EL)

College of Languages, Linguistics and Literature
Courses given in English do not require knowledge of a foreign language. None of the courses count toward requirements for any undergraduate major in the department. Many, like the literature courses, may count toward the University’s humanities requirement.

CLASSICS
EL 122 Greek and Roman Mythology (3)
Principal myths of Greek and Roman literature. AH3
EL 123 Greek and Latin Elements in English (3)
Important roots, prefixes, and suffixes for building a literary vocabulary. AH3
EL 124 Greek and Latin Elements in Scientific Terminology (3)
Important roots, prefixes, and suffixes for building a scientific vocabulary. AH3
EL 227 Introduction to Greek Literature (3)
Major writers: emphasis on Homer, drama, and philosophy. AH3
EL 228 Introduction to Roman Literature (3)
Major writers: emphasis on Vergil, satire, and novel. AH3

FRENCH
EL 264 French Culture for Americans (3)
Study of the shared cultural and historical foundations of France and the United States both past and present. A-F only. Pre: ace student.

EL 335 French Literature Since 1800 (3)
Rapid reading in translation: lectures, discussions, reports. Pre: junior standing or one course in French language or literature. AH3
EL 336 African American Literature (3)
Black African literature in France in 20th century. Major themes of negritude, national political unity, colonialism, traditional culture. Pre: junior standing or one course in French language or literature. AH3
EL 337 French Film (3)
EL 339 French Literature as Film (3)
Exploration of the distinction between literature and film as artistic genres as well as study of major works of literature in respect to the present, from the Middle Ages through the 20th century. Pre: sophomore standing.

EL 364 Survey of French Civilizations (3)
A historical survey of the development of French and Francophone cultures. The course is interdisciplinary, dealing with politics, music, art, other forms of cultural expression, and daily life.

GERMAN
EL 241 Civilization of German Peoples and Country (3)
Cultural and artistic heritage of the German-speaking countries; art, music, literature, and philosophy of ideas in Germany, Austria, and Switzerland. Beginnings to 1871. AH3
EL 242 Civilization of German Peoples and Country (3)
Continuation of 241. Post-1871. AH3
EL 338 German Film (3)
Introduction to German film, film theory, and film analysis. Viewing and discussion of exemplary German films from Expressionism through new German cinema. Pre: two courses from English 250–257.
EL 340 Classical German Literature (3)
Readings in translation from dramatic works of Lessing, Goethe, Schiller. Philosophic and aesthetic views of leading writers of the Enlightenment, Storm and Stress, and classical periods. AH3
EL 342 German Expressionism (3)
Search for the "new man" after World War I. Readings in shorter prose, drama, and lyric poetry. AH3
EL 343 Modern German Literature (3)
Perspective of reality and poetic representations in the 20th century, including influences from Oriental and Eastern philosophy. AH3
EL 410 German Idealism (3)
Origin, impact in other disciplines and movements. Readings from Fichte, Schelling, Hegel, etc. Pre: PHIL 100.

RUSSIAN
EL 350 Russian Short Story (3)
Origin and development (19th and 20th century); periods, themes, styles, and major authors. Pre: 3 credit hours from one of ENG 250–257.
EL 351 19th-Century Russian Literature (3)
Survey in English of major writers from Pushkin through Chekhov; lectures, discussions, short papers. Pre: 6 credit hours from ENG 250–257 or consent. AH3
EL 352 Russian Literature 1900–1950 (3)
Survey in English of major Russian writers from 1900–1950. Pre: 6 credit hours from ENG 250–257 or consent. AH3
EL 354 Russian Literature Today (3) Survey in English of contemporary authors and their works for perspective of inquiry and poetic representation. Pre: 3 credits from ENG 250–257.

SPANISH


EL 360 Spanish Peninsular Literature (3) Reading and discussion of classic works of Spanish literature. Pre: junior standing or consent. AH3

EL 362 Latin American Literature (3) Reading and discussion of classic works of Latin American literature. Pre: junior standing or consent. AH3

EL 363 U.S. Latino Culture and Literature (3) The culture and history of U. S. Latinos through an analysis of their literature and arts and their sociopolitical relationship to the U. S. mainstream culture. Pre: junior standing or consent. AH3

GENERAL AND GRADUATE COURSES

EL 371 Europeans in the Pacific (3) European presence in the Pacific, in relation to literature, art, culture, civilization. Not applicable to language requirement. AH3

EL 480 Classical Foundations of European Literature (3) Greek-Roman origin and evolution of main genres of European literature: epic, lyric, drama, satire, and novel. Works which greatly influenced medieval to modern literature. Pre: junior standing and 6 credit hours in literature courses at 400 level or above.

EL 481 Basic Literary Movements (3) Renaissance, the baroque, Classicism, Romanticism, realism, and contemporary trends in Europe and Latin America. MA candidates in European languages read works in their area of concentration in the original. Pre: junior standing and 6 credit hours in literature courses at 400 level or above.

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

EL 630 Seminar in Research Methods (V)

EL 680 (Alpha) Topics in Literature (3) Study in English of a topic, period, or genre: aesthetic considerations common to European literatures: (B) the modern novel; (C) European literature as a path to self-knowledge; (D) Middle Ages; (E) introduction to literary theory. MA candidates in European languages read works in their major in the original. Pre: graduate standing or consent of department chair.

EL 681 (Alpha) Topics in Language (3) Study in English of topics, periods, etc., in the languages taught in the department: (B) comparison of Romance languages; (C) interpersonal communication; (D) social perspectives. Repeatable. A-F only. Pre: graduate standing or consent.

EL 682 Masterpieces of Medieval Welsh Literature (3) Key prose and poetry underlying the Arthurian tradition in Europe. Language instruction leading to reading knowledge of medieval Welsh. Pre: consent.

EL 683 Hispanic Cultural Studies (3) Critical overview of contemporary theories on Hispanic culture. Issues of identity such as mestizaje, hybridity, and pluralism will be discussed from a hemispheric perspective. A-F only. Pre: consent. EL 699 Directed Research (V) Pre: consent of department chair.

EL 700 Thesis Research (V)

LANGUAGE COURSES

EL 199 Directed Language Study (V) Study in European languages not taught regularly, depending on demand and staff. Pre: consent of department chair.

EL 399 Directed Reading (V) Pre: limited to senior majors with a minimum cumulative GPA of 2.7 or a minimum GPA of 3.0 in major, and consent of department chair.

Family Practice and Community Health (FPCH)

School of Medicine

FPCH 531 Unit VI 7-Week Family Practice Clerkship (10) Ambulatory-based clerkship in family practice to be taken on O‘ahu or one of the Neighbor Islands. Students will learn history taking, physical exam skills, and management of family practice patients of all ages. Emphasis on behavioral care, preventative care, and common ambulatory problems, both acute and chronic. CR/NC only. Pre: BIOM 555, Co-requisite: MED 531, OBGN 531, PED 531, PSTD 531, and SURG 531.

FPCH 532 Family Practice and Community Health Longitudinal Clerkship (10) 5.5-month ambulatory clerkship. Students will learn history taking, physical exam skills, and management of family practice patients of all ages. Emphasis on behavioral care, preventative care, and common ambulatory problems, both acute and chronic. Repeatable once. CR/NC only. Pre: BIOM 555. Co-requisite: MED 532, OBGN 532, PED 532, PSTD 532, and SURG 532.

FPCH 545 (Alpha) Unit VII Electives in Family Practice and Community Health (V) Fourth-year elective in which medical students may do study of selected topics within the field of family practice and community health: (B) primary care preceptorship; (C) topics in community health; (D) sub-internship in family practice; (E) extramural elective in Family Practice and Community Health—miscellaneous; (F) sports medicine preceptorship. CR/NC only. Pre: 531 or 532 for (E).

FPCH 599 Directed Reading/Research (V) Pre: consent.

Family Resources (FAMR)

College of Tropical Agriculture and Human Resources

FAMR 230 Human Development (3) Concepts, issues, theories of human growth and development from conception to death; systems approaches to topics affecting growth and development. SS

FAMR 331 Infancy (3) Intensive investigation into development from prenatal period through two years. Historical and current issues using cross-cultural and systems approach. Focus on optimal development. Pre: 230.


FAMR 333 Adolescence and Young Adulthood (3) Problems, concepts, and research relating to development from puberty through early adulthood. Examination of biological, cognitive, social, and cultural factors affecting the individual. Pre: 230.

FAMR 334 Middle Age (3) Change and continuity in midlife from theoretical and applied perspectives. Key physical, psychological, and sociological events. Community resources to meet needs. Pre: 230.

FAMR 335 Old Age (3) Social attitudes and values regarding aging; roles of elderly; theories of aging: personal continuity; physical, functional, psychological, socioeconomic change; community and societal programs. Pre: 230.

FAMR 341 Parenting (3) Parenting theories, methods, skills, issues, and resources; parent-child relations in various cultural contexts. Pre: 340 or consent.

FAMR 350 Leadership and Group Process (3) Exploration of leadership research and theories and their application to leadership development; designed to enhance personal and interactive leadership. Pre: PSY 100 or SOC 100.

FAMR 352 Community Needs and Resources (3) Theory and practice in determining community needs and resources; community resources development based on needs identification. Pre: PSY 100 or SOC 100.

FAMR 360 Family Resource Management (3) Concepts, principles, and practices in managing family and household resources. Pre: PSY 100 or SOC 100.

FAMR 361 Family Financial Planning (3) Analytical approach to family financial planning from the perspective of changing family demands over the life cycle. Pre: 360, ECON 120, or consent.

For key to symbols and abbreviations, see the first page of this section.
FAMR 363 Consumer Economics (3) Consumer rights, responsibilities, and resources; consumer decision-making; factors affecting consumer functioning within the economy. Pre: ECON 120.

FAMR 371 Shelter and Society (3) Development and characteristics of traditional shelter and furnishings, and customs with focus on Hawaii, the Pacific Basin, and Asia.

FAMR 380 Research Methodology (3) Fundamentals of scientific methodology and techniques in design and data collection; introduction to statistics for decision-making and program evaluations in agriculture and human resources. Pre: 230 or AGRN 220. Co-requisite: 380L.

FAMR 380L. Research Methodology Lab (1) (1 3-hr Lab) Test design, computer use, data analysis. Co-requisite: 380.

FAMR 425 Partnerships with Families and Professionals (3) Knowledge and skills for relating effectively with families and professionals on behalf of the children and youth with and without disabilities. Coverage of the context in which family members and school personnel interact. A-F only. Pre: 341 or consent. (Cross-listed as SPED 425)

FAMR 436 Ethnicity and Aging (3) Study role of ethnicity in the aging process; impact on expectations, resources, behaviors of elderly and their families. Implications for program development and family management. Pre: 230.

FAMR 442 Marriage Development (3) Marital interaction and development; divorce and remarriage; resources and techniques for marital adjustment, enrichment, and growth. Pre: 340.

FAMR 443 Work and the Family (3) Work/family roles, relationships, and interactions; issues, problems, and resources relevant to dual career marriage, maternal employment, and other areas of work/family interface. Pre: 340.

FAMR 444 Contemporary Family Issues (3) Investigation of current issues with impact upon family quality of life, with emphasis on the interdependent nature of families and their environments. Pre: 340.

FAMR 452 Community Program Development (3) Concepts and theories of community program development; principles, practices, and procedures in administration and supervision of volunteer services surveyed and analyzed. Pre: 352.

FAMR 453 Quality of Life Indicators (3) Quality of life indicators used in program planning and evaluation research; cross-cultural perspectives on strategies for improving individual, family, and community life. Pre: 352.

FAMR 454 Family Public Policy (3) Cross-national survey of family public policy; analysis, revision, and development of family public policy; impacts of policy on consumers and families. Pre: 352.

FAMR 455 Consumer Communications (3) Development, production, analysis, and evaluation of consumer materials for print, broadcast, and videotape. Pre: 363 or consent.

FAMR 460 Family Management Practice (3) Strategies for working with families to enhance management practices; application of management concepts, methods, and skills to specific household and family problems. Pre: 360.

FAMR 468 Family Economics (3) Study of personal family resources and its interaction with the economy. Focuses on contemporary economic problems that affect the welfare of families. Pre: 360, ECON 120, or consent.

FAMR 482W Senior Seminar (3) Preparation, presentation, and discussion of student research papers dealing with selected topics in family resources. Pre: senior standing.

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

FAMR 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.

FAMR 496 Supervised Experience in Family Resources (V) Supervised course material preparation and teaching experience in assigned class. Repeatable. Pre: consent.

FAMR 499 Directed Reading and Research (V) Independent reading and research on a topic done under supervision of a faculty member; outcomes contracted in writing with faculty member at beginning of semester. Pre: consent.

FAMR 699 Directed Reading and Research (V) Pre: consent.

Finance (FIN)

College of Business Administration

FIN 305 Problems of Business Finance (3) Application of financial principles to cases involving important financial decisions. Pre: BUS 314.


FIN 311 Investments (3) Introduction to various investment media and capital markets. Topics include the analysis of security returns using techniques such as beta, filter rules, and portfolio theory. Pre: BUS 314.


FIN 330 Bank Financial Management (3) Analysis of financial institution management within the domestic economy and regulatory environment. Topics include federal reserve activities, interest rates, regulation, lending, investments, and asset/liability management. Pre: BUS 314.

FIN 331 International Banking (3) Commercial, investment, and merchant banking. Includes theory and practical applications. Topics include international lending, Euromarkets, global gap management, Forex activities, and global risk management. Pre: BUS 314.

FIN 360 Seminar in Finance (3) In-depth analysis of selected current practices and issues in finance. Repeatable with change in topic. Pre: BUS 314.

FIN 390 (Alpha) Advanced Topics in Finance (3) Advanced topics both of a theoretical and an empirical nature in finance. (A) Japanese financial management; (D) investment management; (E) portfolio management theory; (F) capital assets. Pre: BUS 314 and other courses specified for each topic (see department for specific prerequisites).

FIN 399 Directed Reading and Research (V) Reading and research in a special area of 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 the faculty adviser.

FIN 533 Problems in Business Finance (3) Application of financial principles and analytical techniques to financial problems. Case method. Pre: BUS 614 or consent.

FIN 631 Investment Analysis and Management (3) Techniques of security analysis, theories of investment, and the analysis of investment decisions related to portfolio planning. Pre: BUS 614 or consent.

FIN 635 (Alpha) Advanced Topics in Finance (3) Major current financial issues and problems. (A) Japanese financial management; (D) portfolio management theory; (E) capital asset analysis; (F) stocks, bonds, and modern instruments. Pre: BUS 614 or consent.

FIN 637 International Financial Management (3) Financial decision-making in an international setting: analysis of direct foreign investment; economic, accounting, and regulatory environments, including taxation; international money and capital markets; import and export financing; multinational working capital management; and risk aspects of international finance. Pre: BUS 614 or consent.

FIN 638 Bank Financial Management (3) Financial management of financial institutions. Includes theory and applications. Topics include federal reserve activities, asset/liability management, lending, investment, and the regulatory environment. Pre: BUS 614 or consent.

FIN 639 International Banking (3) Commercial, investment, and merchant banking in the international arena. Includes international lending, Euromarkets, global gap management, Forex activities, and international risk management. Pre: BUS 614 or consent.

For key to symbols and abbreviations, see the first page of this section.
COURSES: FINANCE–FOOD SCIENCE AND HUMAN NUTRITION

FIN 660 Seminar in Finance (3) In-depth analysis of selected current practices and issues in finance. Pre: BUS 614 or consent. May be repeated with change in topic.

Food Science and Human Nutrition (FSHN)

FSHN 181 The Chemical Nature of Food (3) Lectures, discussions, and demonstrations on how food components contribute to the functional, sensory, and safety characteristics of foods, and what changes occur in foods due to preparation, processing, and storage. Repeatable once.

FSHN 181L Food Preparation Lab (1) (1 3-hr Lab) Experiments in foods emphasizing ingredient function and standard preparation methods for food groups. Corequisite: 181.

FSHN 185 The Science of Human Nutrition (3) Integration of natural science concepts basic to the study of human nutrition. Emphasis on nutrient requirements of healthy individuals, food sources, functions of nutrients. NS1

FSHN 250 Human Needs and Environmental Resources (3) (2 Lec, 1 3-hr Lab) Issues related to human needs and resource sustainability; their impact on environmental concerns and quality of life are explored from the perspective of modern agriculture and human resources.

FSHN 281 Advanced Foods (3) (2 Lec, 1 3-hr Lab) Effects of processing and preparation techniques on nutrient content. Standards of food quality; utilization of organoleptic, physical, and chemical measurements. Pre: 181, CHEM 152, and the equivalent of two years of high school algebra.

FSHN 312 Quantity Food Production (3) (2 Lec, 1 3-hr Lab) Principles of food and beverage management applied to quantity food production operations, consideration of system component including marketing, menu planning, logistical support, production, and control. Repeatable once. Pre: 181 or TIM 184, or consent. (Cross-listed as TIM 312)

FSHN 320 Food Sanitation (3) Principles of food sanitation; foodborne illnesses; hazard analysis critical control points (HACCP) program; federal and state sanitation regulations; inspection; case studies. Pre: 181, TIM 184, or consent. Spring only.

FSHN 370 Lifespan Nutrition (V) Nutritional requirements and food needs during infancy, early childhood and adolescence, and aging. One credit provided for each age group module. One to three credits. Pre: 185, ZOOL 141, ZOOL 141L, ZOOL 142 (or concurrent), ZOOL 142L (or concurrent); or consent.

FSHN 401 Food Processing I (4) (3 Lec, 1 3-hr Lab) Principles and applications of food dehydration, thermal processing, low temperature preservation, chemical and biochemical preservation, irradiation, packaging, manufacturing, plant sanitation, water and waste management. Pre: CHEM 162, CHEM 162L, PHYS 151, PHYS 151L, MIRC 130, and MIRC 140; or consent.

FSHN 403 Microbiology of Foods (3) Microorganisms encountered in foods; types of food spoilage; microbial hazards in food; methods of food preservation. Pre: MIRC 130. (Alt. years: fall)

FSHN 410 Food Service Systems Management (3) Current types of food service systems, components of these systems, and managerial methods applied to produce effective systems. Systems approach to food service management, planning, and decision-making; human resources management, and controlling functions. Pre: 512 or TIM 512, and MGT 301 or TIM 365; or consent. (Cross-listed as TIM 410)

FSHN 411 Food Engineering (3) (2 Lec, 1 3-hr Lab) Principles and application of thermodynamics, electricity, fluid mechanics, heat transfer, psychrometry, and material and energy balances of food processing and preservation. Pre: PHYS 100. (Cross-listed as BE 411) (Alt. years: fall)

FSHN 430 Food Chemistry (3) Chemical properties of food constituents discussed in relation to their effect on processing, nutrition, and spoilage. Pre: CHEM 171, CHEM 171L, CHEM 272, and CHEM 272L. (Alt. years: fall only)

FSHN 430L Food Chemistry Lab (1) (1 3-hr Lab) Application of different chemical methods in the study of food constituents—proteins, lipids, carbohydrates, pigments, enzymes, etc. Pre: 430 (or concurrent). (Alt. years: fall only)

FSHN 440 Food Safety (3) Discussion of potential microbiological, parasitic, chemical, and natural food hazards; food laws and standards; and related aspects of consumer protection. Pre: biology. (Alt. years: spring only)

FSHN 445 Food Quality Control (3) Fundamental principles of quality control in the food industry: measurement of quality parameters, utilization and integration of the individual test procedures into grades and standards of quality, sampling, and reporting results.

FSHN 451 Community Nutrition (3) (2 Lec, 1 3-hr Lab) Concepts and methods of nutrition program planning; analysis of nutritional problems of local, national, and international communities. Pre: 370, and AREC 310 or FAMR 280; or consent.

FSHN 452 Concepts in Nutrition Education (5) (2 Lec, 1 2-hr Discussion) Concepts, methods, and materials used in nutrition education of community, clinical, and school populations. Strategies used to educate groups or individuals. Repeatable once. Pre: 451 or consent.

FSHN 467 Medical Nutrition Therapy I (V) Development of dietary, anthropometric and clinical lab assessment skills measuring nutritional status. Understanding pathophysiology of disease processes, medical terminology and nutritional intervention, utilizing case studies. Repeatable once. Pre: 486 or consent.

FSHN 468 Medical Nutrition Therapy II (3) Understanding of the pathophysiology of disease processes and nutritional intervention, using medical terminology and case studies. Repeatable once. Pre: 467 or consent.

FSHN 469 Nutrition Counseling Skills (1) Theory and practice in nutritional counseling. Pre: 452 (or concurrent) and 467 (or concurrent), or consent.

FSHN 475 Human Nutrition for Health Professionals (3) Basic principles and practices; includes sources and functions of nutrients, nutritional needs and habits. Intended for students in pre-nursing and nursing, and graduate students in health professions. Pre: two semesters of chemistry, and one semester of biology or zoology; or consent.

FSHN 476 Cultural Aspects of Food Habits (3) Study of eating from behavioral perspectives. Implications for health practitioners and health education. Pre: two semesters of anthropology, sociology, or psychology; and junior and senior standing. (Alt. years: spring)

FSHN 477 Food Analysis (2) Principles of sample preparation and chemical and physical analysis of food components using current methodology. Pre: 450, CHEM 162, CHEM 253, or ENBI 402; or consent. (Alt. years: spring)

FSHN 477L Food Analysis Lab (2) (2 3-hr Lab) Application of different chemical and physical methods for the identification and quantitation of food components. Corequisite: 477. (Alt. years: spring)

FSHN 480 Nutrition in Exercise and Sport (3) Effects of physiologic demands of exercise on nutrition. Emphasis on physiologic and biochemical basis for nutrition recommendations to enhance exercise participation and optimize athletic performance. Pre: 185 and KLS 254, or consent. (Cross-listed as KLS 480)

FSHN 482 Current Topics in Food and Nutritional Sciences (1) Pre-professional seminar in food and nutritional sciences. Seminar provides a forum for the discussion of topics of current relevance to students preparing for a career in this field. Repeatable. CR/NC only.

FSHN 485 Nutritional Biochemistry I (3) Metabolism and biochemistry of carbohydrates, lipids, and proteins, including chemical structure, digestion, absorption, transport, cellular/molecular functions in human nutrition; integration of metabolic pathways; energy metabolism and balance, including relevance to chronic disease. Repeatable. Pre: either PHYS 142 and PHYS 142L or PHYS 302 and PHYS 302L, and ENBI 402 or BIOG 441; or consent.

FSHN 486 Nutritional Biochemistry II (3) Metabolism and biochemistry of vitamins, minerals, and dietary fiber, including chemical structure, digestion, absorption, transport, cellular/molecular functions in human nutrition; relevance to establishing nutrient requirements and to mechanisms of chronic disease. Repeatable twice. Pre: FSHN 485 and either ANAT 301 or PHYL 301, and one of ENBI 402, BIOG 341, or BIOG 441; or consent.

FSHN 490 Field Practicum in Dietetics (4) Organized on-the-job learning experience supervised by coordinating instructor and on-site supervisor with weekly discussions. Repeatable once. A-F only. Pre: 468 (or concurrent) and 469 (or concurrent); senior standing; and consent.

FSHN 491 Topics in Food Science and Human Nutrition (V) Study and discussion of significant topics, problems. Offered by visiting faculty and/or for extension programs. Repeatable.
FR 491 Seminar in French Literature (3) Study of authors, a period, or a topic. Repeatable. Pre: senior standing. Honors Program, or permission of division chair.

FR 506 French for Reading Proficiency (3) Reading of scholarly and technical French for graduate students; open to undergraduates with consent of department chair. Not applicable to undergraduate language requirement. CR/NC only. Repeatable.

FR 601 Seminar in 20th-Century French Literature (3) Authors and movements of modern period.

FR 602 Seminar in French Poetry (3) Representative poems from Renaissance to the present.


FR 620 Masterpieces of the 17th Century (3) Dramatic or prose works of the classical period.

FR 651 Philosopchic Currents in 18th Century (3) Philosophic movements and their impact on the social, political, and literary life of the period and the modern era.

FR 661 Stylistics (3) Designed to give mastery of structure and phrasing. Translation into French, discussion, composition.


FR 672 (Alpha) Seminar in Medieval Literature (3) Genesis and evolution of literary genres from the 12th to 15th centuries. (B) epic and romance; (C) drama and prose; (D) lyric poetry. Repeatable.

FR 681 Seminar: The Novel in France (3) Novels which have influenced movements or established techniques. Repeatable with consent of chair of graduate field.

FR 690 The Theater in France (3) Historical development; major dramatists who have influenced movements or established techniques. Pre: 6 credit hours at 400 level.

FR 699 Directed Research (V) Pre: consent of department chair.

FR 735 Seminar in French Literature (3) Study of authors or a period. Repeatable. Pre: consent of chair of graduate field.

FSHN
See Food Science and Human Nutrition

Genetics and Molecular Biology (GENE)
School of Medicine

GENE 351 Genetics, Evolution and Society (3) Role of genetics in evolution, medicine, behavior, plant and animal breeding, and technology; its impact on today's society. NS1

GENE 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 171 and BIOL 171L, or BIOL 172 and BIOL 172L, or consent.

GENE 499 Genetic Problems (V) Directed reading and research in genetics. Pre: 351 or 411.

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

GENE 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.

GENE 601 Probability and Statistics in Genetics (3) Basic concepts of probability theory and statistical inferences in genetic applications. Pre: 411 or consent.

GENE 604 Evolutionary Genetics (2) Genetic changes involved in the processes of adaptation and in species formation. Pre: 411 or equivalent. Recommended: population and/or quantitative genetics.

GENE 618 Cytogenetics (3) (2 Lec, 1 1-hr Lab) Correlation of genetic and cytological phenomena. Pre: 411.

GENE 625 Advanced Topics in Genetics (2) Advanced treatment of frontiers in genetics. Pre: graduate standing in genetics or consent.


GENE 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.

GENE 671 (Alpha) Techniques in Genetics (V) Laboratory training in procedures used in diagnosis of genetic diseases, cytogenetics, immunogenetics, and dermato-glycophysics. Pre: graduate standing in genetics or consent.

GENE 672 Techniques in Genetics (3) Continuation of 671.

GENE 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 BIOL 441 or equivalent, or consent.

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


GENE 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.

GENE 702 Immunogenetics (3) (2 Lec, 1 1-hr Lab) Immunological and genetic analysis of antigenic variation; cellular and soluble antigentic systems; transplantation; genetic control of immune response. Pre: 680 or consent.

GENE 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.

GENE 750 Human Population Genetics (3) Comprehensive treatment of the genetics of human populations with emphasis on population structure. Pre: 650.

GENE 800 Dissertation Research (V) Pre: acceptance of dissertation topic.

Geography (GEOG)
College of Social Sciences

A 100-level course, or consent of instructor, is prerequisite to all courses numbered over 299.

GEOG 101 The Natural Environment (3) Survey of man's natural environment; distribution and interrelationships of climates, vegetation, soils, landforms. NS3

GEOG 101L The Natural Environment Lab (1) Analysis by use of maps, air photos, field and laboratory observation, and experimentation. Emphasis on Hawai'i and on human modification of environment. Pre: 101 (or concurrent). NS3

GEOG 102 World Regional Geography (3) World's major cultural regions: geographic aspects of contemporary economic, social, political conditions. SS

GEOG 151 Geography and Contemporary Society (3) Elements of economic geography and resource management, population and urban geography; application to current problems of developed and underdeveloped worlds. SS


GEOG 301 Atmospheric Pollution (3) Interdisciplinary approach: chemical, meteorological, health, economic, technological, control, and legal aspects; public awareness. Pre: 101, MET 101, or CHEM 151.

GEOG 303 General Geomorphology (3) Introduction to geomorphological concepts, process mechanisms, and relationships between forms and processes. Emphasis on various subdisciplines of geomorphology: coastal hillslopes, fluvial, aeolean, and glacial. Pre: 101 and 101L, or GG 101 and GG 101L.

GEOG 305 Water and Society (3) Interaction of people with water at household, community, regional, national, and international scales, from cultural, political, economic, and biophysical perspectives. Pre: 101 or environmental science or ecology course.

GEOG 309 Plants, People and Ecosystems (3) Introduction to ecosystem concept; environmental adaptations for energy and nutrient transfer; characteristics, dynamics,

GEOG 312 Agriculture, Food and Society (3) Examines historical and contemporary development of the global agro-food systems. The impacts of technological, political, and economic changes to food security, environment and development. Open to non-majors.

GEOG 314 Tropical Agrarian Systems (3) Analysis of environmental potential and constraints and of spatial organization of economy and society of tropical agrarian systems. Emphasis on change through colonial and post-colonial periods.

GEOG 321 Regional Analysis (3) Spatial dynamics and environmental implications of urban and rural development. Concepts of regions, process of regional development, patterns of spatial interaction, and theoretical bases for development strategies; emphasis on Hawai‘i. Pre: 102 or 151.

GEOG 324 Geography of Global Tourism (3) Tourist landscape in relation to resources, spatial patterns of supply and demand, impacts of tourism development, and models of tourist space. Flows between major world regions. Pre: 102 or 151. (Cross-listed as TIM 324)


GEOG 328 Culture and Environment (3) Introduction to cultural geography, the cultural landscape, and built environment. A-F only. Pre: consent.

GEOG 330 Population Geography (3) Spatial view of human population; distribution, structure, and internal dynamics. Recent geographic approaches to population problems and processes.

GEOG 335 Political Geography (3) Political organization of area in the nation state; geographic background of international relations. Boundaries and disputed territories, exploitation of physical resources, evolving geography of the territorial sea and zones of exclusive economic interest.

GEOG 336 Geography of Peace and War (3) Geographical factors underlying conflict in the world. Pre: 101, 102, or 151. SS

GEOG 340 Geography of North America (3) Overview of the physical and cultural geography. Regions and characters. Patterns of population, natural resources, industry, agriculture, and transportation/communication networks. Pre: 101, 102, or 151.

GEOG 352 Geography of Japan (3) Regional synthesis of physical and cultural features; economic, social, political geography; origins and development of cities.

GEOG 353 Geography of China (3) Topics: environmental parameters and resource base, ecological control and resource management, institutional and technological transformation of agriculture, industrial potential and industrial location, settlement patterns and rural urban symbiosis.

GEOG 355 Geography of South Asia (3) Introduction to physical and human geography of India, Bangladesh, Pakistan, Sri Lanka, Himalayan kingdoms. Environmental, economic, social, cultural, and political factors in development.

GEOG 356 Geography of Southeast Asia (3) Southeast Asia in world economy. Human and physical resources; returns achieved by various methods of land use. National economies; problems and prospects of modernization.

GEOG 365 Geography of the Pacific (3) Physical character of the Pacific; cultural, political, economic geography of Melanesia, Micronesia, Polynesia (except Hawai‘i).

GEOG 366 Geography of Honolulu (3) Development of Honolulu and O‘ahu from 1778. Evolution of function, land use, and social patterns. Contemporary planning and environmental issues arising from urban growth.

GEOG 368 Geography of Hawai‘i (3) Regional, physical, cultural geography. Detailed study of people and resources.

GEOG 370 Map and Aerial Photo Interpretation (3) (2 Lec, 1 3-hr Lab) Introduction to sources, analysis, interpretation, and application of maps and aerial photographic images. Topographic maps, aerial photographs, satellite images, field use. For nonmajors. Pre: a 100-level geography course or GG 100, or consent.

GEOG 375 Introduction to Cartography and Air Photo (3) (2 Lec, 1 3-hr Lab) Principles of cartography: compilation and measurement from aerial photographs, alternate forms of data presentation, symbolism, design, and map projection.

GEOG 380 Analytical Methods in Geogra-phy (3) Analytical problems of and mathematical methods for describing and interpreting geographic phenomena: measurement and scaling; dimensional analysis; structural/relational models; spatial sampling and statistics; matrix methods. Pre: 101 and 151 (or concurrent).

GEOG 385 Research Methods in Human Geography (3) Introduction to the methodologies and practice of research in human geography. Combines lectures, workshops, and assignments. Students will conduct and report upon their own research. Pre: 151.


GEOG 399 Directed Reading (V) Limited to senior majors with a minimum cumulative GPA of 2.7 or a minimum GPA of 3.0 in geography.

GEOG 400 Vegetation and the Climate System (3) Role of vegetation in the climate system; links to hydrology and biogeochemical cycling; vegetation and climate history; evolution of terrestrial ecosystems; effects of global warming. Pre: 300 or consent.

GEOG 401 Climate Change (3) Approaches to the study of past and future climate change. Pre: 300.

GEOG 402 Agricultural Climatology (3) Analyzing climatic data; relation to photosynthesis, phenological development, and crop yields. Crop-wather models as guides to improved land-use planning and agronomic practices. Pre: 300 and 312, or BOT 101 and MET 101; or consent.

GEOG 403 Fluvial Geomorphology (3) Introduction to the single most important geomorphic agent shaping the terrestrial environment. Focus on fluvial process, fluvial dynamics, fluvial landforms, and sediment transport. Pre: 305 or GG 306

GEOG 404 Drainage Basin Geomorphology (3) The drainage basin as the fundamental unit in geomorphology. This provides the basic framework for studying the hillslope system, soil system, and fluvial system. Pre: 305 or GG 306.


GEOG 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 101, BIOL 123, or BIOL 124 and either 326 or BIOL 310; or consent. (Cross-listed as BIOL 410)

GEOG 411 Human Dimensions of Global Environmental Change (3) Past, present, and potential future effects of global environmental change upon humanity; anthropogenic causes and catalysts; past, current, and potential human responses and policy options. Pre: 101 or consent.


GEOG 415 Geography of Health and Disease (3) Principles, methods, and research design of medical geography. Analysis of place as applied to questions of health and disease. Overview of global health issues. Pre: 380 or consent. (Cross-listed as PH 415)

GEOG 420 Hazardous Materials (3) Introduction to state and federal environmental regulations relative to hazardous substances. Analysis of specific health and environmental impacts of hazardous waste. Pre: CHEM 151 (or concurrent) or consent. (Cross-listed as ENBI 420 and PH 420)

GEOG 421 Urban Geography (3) Origins, functions, and internal structure of cities. Problems of urban settlement, growth, decay, adaptation, and planning in different cultural

For key to symbols and abbreviations, see the first page of this section.
and historical settings. Dynamics of urban land use and role of policies and perceptions in shaping towns and cities. Prereq: 102 or 151.

**GEOG 425 The Geography of Film (3)**

Landscapes of film. How movies work by conveying a sense of space and a sense of place. Genres and landscapes. Prereq: 151 or 328.

**GEOG 435 Political Geography of Oceans (3)**

The oceans' evolution and relation to problems of economic development, resources, seapower, shipping, trade. Trade: Pre: 335 or consent.

**GEOG 445 Decision-Making in Geography (3)**

Optimization under constraints, using linear, integer, and multi-objective programming. Applications to geography, planning, and resource management for problem solving, research, and theory development. Prereq: junior standing.

**GEOG 453 Geography of China's Modernization (3)**

Applies geographic principles and approaches to explore the rapid transformation of the spatial structure of recent socio-economic development in China. Special emphasis given to resource management and environmental quality, which are important factors in sustainable development. Course is designed to explore China's role in the world economy of the 21st century and to meet the needs of students majoring in business administration, international trade, economics, political science and Asian studies. Prereq: 102 or consent.

**GEOG 455 Resource Management (3) (2 Lec, 1 3-hr Lab)**

Hands-on development of analytical models for application to problems of water resource, coastal fisheries, agroforestry, and/or land management. Focus on problems facing Hawai'i and the Pacific. Prereq: 101, 445 or AREC 410 (or equivalent), and SOC 225 (or equivalent); or consent. May be taken concurrently with 445 or AREC 410.

**GEOG 468 (Alpha) Topics in Hawaiian Geography (3)**

Selected topics in the geography of Hawai'i. Repeatable. Prereq: 368.

**GEOG 470 Remote Sensing (3) (2 Lec, 1 3-hr Lab)**

Air photo interpretation, application in natural and social science research, electromagnetic spectrum, exotic sensors, satellite imagery interpretation. Research project, lab. Prereq: 375 or consent.

**GEOG 472 Field Mapping (3)**

Techniques for field measurement and recording of cultural and physical data. Field sketching, Brunton surveying, plane table mapping, oblique photo compilation, topographic mapping, and representation of field data. Prereq: 375.

**GEOG 475 Cartographic Illustration (3) (3 2-hr Lab)**

Tools and methods for preparation of cartographic materials for illustration and publication; drafting and reproduction. Prereq: 375 (or concurrent) or consent.

**GEOG 476 Advanced Cartography (3) (3 2-hr Lab)**

Special topics: computer mapping, relief representation, map reproduction methods, use of color, analytic map interpretation, aerial and satellite cartography. Prereq: 375 and 475, or consent.

**GEOG 480 Advanced Quantitative Methods in Geography (3)**

Multivariate analysis, factor analysis, and analysis of variance, dummy variables, canonical correlation analysis; application to geographic research. Prereq: 380 or consent.

**GEOG 487 Advanced Computer-Assisted Cartography (3)**

Concepts underlying computer programming for cartographic applications. Prereq: 375 and FORTRAN programming ability, or consent.

**GEOG 488 Geographic Information Systems (3)**


**GEOG 490 Senior Thesis (3)**

Preparation of research paper under individual faculty supervision. Recommended for admission to graduate program. Prereq: 390.

**GEOG 491 Teaching Geography (6)**

For geography majors who lead, under supervision, a freshman seminar section of geography. Prereq: senior standing and consent.

**GEOG 492 Practicum in Geography (V)**

Internship in applied geography under professional and faculty supervision. Field placement integrated with academic study. Repeatable to 6 credit hours maximum. Prereq: senior major and consent.

**GEOG 600 Seminar in Climatology (3)**


**GEOG 618 Human Environment Systems (3)**

Role and potential of systems science in analysis of human environment interaction, especially resource management. Framework and methodology for problem structuring; overview of techniques. Prereq: graduate standing or advanced undergraduate standing with consent.

**GEOG 628 (Alpha) Resource Systems (3)**

Resource development and use in a time perspective. Ecological and socioeconomic impacts, concepts, definitions, and methodol-

**GEOG 631 Urban and Regional Planning in Asia (3)**

Key issues and policies in urban planning, rural-urban relations, rural regional planning, and frontier settlement in Asia and the Pacific. Repeatable. Prereq: PLAN 600 or consent. (Cross-listed as PLAN 630)

**GEOG 632 Field Study of Population (3)**

Concepts and techniques in field study of nonliterate (tribal and peasant) populations. For graduate students in social sciences planning field research that involves taking census. Prereq: consent. (Cross-listed as ANTH 632)

**GEOG 633 International Political Economy and Urban Policy (3)**

Urbanization and urban policy in Asia and the Pacific region with focus on the international dimension of national and local restructuring. Prereq: PLAN 630 or consent. (Cross-listed as PLAN 635)

**GEOG 635 Economic Analysis for Urban and Regional Planning (3)**

Reviews and builds skills in applying basic theories and principles of urban and regional economics in contemporary U.S., Hawai'i, and Asia-Pacific. Repeatable. Prereq: consent. Fall only. (Cross-listed as PLAN 603)

**GEOG 639 Planning for Rural Development (3)**

Rural development theories and policies. Planning and spatial aspect of Aslian and Pacific development: integrated development, agropolitan development and rural industrialization. Prereq: PLAN 630 or consent. (Cross-listed as PLAN 639)

**GEOG 651 Seminar in Geography of China (3)**

Repeatable. Prereq: consent.

**GEOG 652 Contemporary Japan Seminar (3)**

Selected physical and human features that represent economic, social, and political life of modern Japan. Repeatable. Prereq: consent. (Cross-listed as ASAN 652)

**GEOG 653 Seminar in Geography of South Asia (3)**

Repeatable. Prereq: consent.

**GEOG 654 Seminar in Geography of Southeast Asia (3)**

Repeatable. Prereq: consent.

**GEOG 665 Seminar in Geography of the Pacific (3)**


**GEOG 691 History of Geographic Thought (3)**

Development from early Greece to present. Origins of current trends and relations to contemporary thought in natural and social sciences.

**GEOG 692 Faculty Seminar Series (1)**

Graduate seminar required of all MA students and recommended for PhD students. Single credit course in which faculty present ongoing research in their fields. Prereq: consent. Co-requisite: 695.

**GEOG 693 Technology and Natural Risks Methods of Analysis (3)**


**GEOG 695 Concepts and Theories in Geography (3)**

Concepts, theory, models. Geographic approaches to spatial and environmental problems. Required of entering graduate students unless waived by department. Prereq: consent.

**GEOG 696 Research Design/Methods in Geography (3)**

Elements of research design, practical field experience, exposure to research and ideologies, broad exposure to heritage and ethos of the discipline. Prereq: 695. 

**GEOG 699 Directed Research (V) CR/NC only. Prereq: consent.

**GEOG 700 Thesis Research (V)**

**GEOG 703 Geomorphology (3)**

Current understanding of geomorphological concepts, processes, and the dynamic relationship between human landscape modification and system response. Prereq: one of 503, 403, or 404; or consent.

**GEOG 710 (Alpha) Special Topics (3)**

Study and discussion of significant topics, problems. Repeatable.

**GEOG 728 Seminar: Resource Management in Asia-Pacific (3)**

Examination of resource management problems in Asia and the Pacific. Problems of resource use—agriculture, forestry, energy, minerals, ocean, air quality. Prereq: AREC 458 or ECON 458, or consent.

**GEOG 750 Research Seminar: Biogeography (3)**

**GEOG 751 Research Seminar in Medical Geography (3)**

Research seminar in medical geography. Repeatable. Prereq: 415 or PH 415, or consent. (Cross-listed as PH 751)
GG 168 Planetary Science in the Classroom (4) (2 3-hr Lec/Lab) Combined lecture-lab course for pre-service and in-service teachers. Covers basics of planetary geology (volcanism, impact cratering, remote sensing, etc.) through inquiry-based, hands-on laboratory activities suitable for use in K-12 classrooms. Field trip. NS2

GG 201 Earth Materials (4) (3 Lec, 1 3-hr Lab) Structure and composition of minerals; field occurrences, description, classification, and origin of igneous, sedimentary, and metamorphic rocks. Pr: either 101 or 103, 101L, CHEM 161 or CHEM 161L; or consent.

GG 202 Earth History (4) (3 Lec, 1 3-hr Lab) Principles of stratigraphy, paleontology, sedimentology, tectonics, and paleoclimatology. Geologic time and its measurement. History of Earth and evolution of life from the stratigraphic and fossil record. Pr: 201 or consent.

GG 203 Earth Structure and Dynamics (4) (3 Lec, 1 3-hr Lab) Structure and physics of the Earth: plate tectonics, crustal deformation, earthquakes, seismology, geomagnetism. Labs in mapping, geophysical exploration. Pr: 201, and either PHYS 151 or PHYS 170; or consent.

GG 300 Volcanology (3) Principles; understanding eruptions and their products; impact on humans. Field trips to Hawaiian volcanoes. Pr: 201 or consent.

GG 301 Mineralogy (4) (3 Lec, 1 3-hr Lab) Continuation of 201: crystallography, crystal chemistry, phase equilibria, and crystal structures. Also covers mineral optics and identification. Emphasis on hands-on use of modern equipment (e.g., XRD) and techniques useful in many subfields of geosciences. Pr: 201, and CHEM 162 and CHEM 162L, or CHEM 171 and 171L.

GG 302 Igneous and Metamorphic Petrology (3) (2 Lec, 1 3-hr Lab) Survey of composition, classification, and occurrence of igneous and metamorphic rocks. Hand-specimen identification and optical petrography of igneous and metamorphic rocks. Pr: 201 and 301, or consent.

GG 303 Earth and Environmental Mechanics (3) Introduction to continuum mechanics. Applications to geologic phenomena, e.g., mountain uplift; landslides; surface-water and groundwater flow; fracture and fracture of the Earth’s crust; glaciers; lava flows. Pr: 203 and MATH 206, or consent.

GG 305 Geological Field Methods (3) Methods used in geological investigations in the field. Eight hours on Saturday in the field. Pr: 201, 202, or 203; or consent.

GG 309 Sedimentology and Stratigraphy (3) (2 Lec, 1 3-hr Lab) Principles of sedimentology, sedimentary petrology, geochemistry and stratigraphy. Description and discussion of modern and past processes and environments that form sedimentary rocks. Properties of sedimentary rocks and interpretation of these properties and stratigraphic relationships in terms of Earth history. Pr: 202 and 301, or consent.


GG 313 Geological Data Analysis I (3) Exploratory data analysis, probability theory and statistics, curve interpolation and approximation, simple and multiple regression, multivariate analysis, and analysis of directional data. Pr: MATH 206 (or concurrent) or consent.

GG 324 Low-Temperature and Environmental Geochemistry (3) Applications of thermodynamics and solution, and organic and isotopic geochemistry to understanding the ocean-land-atmosphere-biosphere system, its 4.5 billion year evolution, and recent effects of human action. Pr: 201 and 202, or consent.

GG 325 High Temperature Geochemistry (3) Factors controlling the distribution of chemical elements in the Earth’s crust, mantle, and core. Geochronology. Use of isotopic and elemental tracers of Earth’s history and interior processes. Pr: 202 (or concurrent) or consent.

GG 399 Directed Reading (V) Individual reading in geology and geophysics. Pr: consent.

GG 401 Introduction to Mineral Physics (3) Scientific study of the materials that make up the Earth. Properties of minerals on micro- and macro-scales; their properties and behavior. Pr: 302 and PHYS 272, or consent. (Alt. years)

GG 402 Hawaiian Geology (3) Consists of lectures, discussions, and field trips about the geology of the Hawaiian Islands. Focus is on geological processes and the geologic history of all islands will be covered. Pr: 201, 202, and 203; or consent.

GG 407 Energy and Mineral Resources (3) Origin and distribution of ore deposits, mineral fuels, and industrial minerals. Coverage and detail will depend partly on student interest and background. Pr: 201, 202, and 203 (or concurrent).

GG 420 Quaternary Geology (3) Quaternary records and physical processes of global and local environmental change; dating techniques; late Pleistocene and Holocene climate change, sea-level movements, and ice volume. Repeatable once. Pr: 202 or consent.

GG 423 Marine Geology (3) Sediments, structure, geophysics, geochemistry, history of ocean basins and margins. Pr: 201, 202, and 203; or consent. (Cross-listed as OCN 423)

GG 426 Sedimentary Isotope Geochemistry (3) Stable-isotope techniques applied to questions of origin and diagenesis of sedimentary minerals, palaeoclimates, environmental geochemistry, organic material, and petroleum. Pr: 324 and consent. (Alt. years)

GG 430 Geology and Mineral Resources of Asia (3) Geologic setting of ore, industrial mineral, and fuel deposits of Asia, its adjacent islands, and shallow seas. Probability of future discoveries in major provinces. Pr: 101, 103, or consent. (Alt. years)


For key to symbols and abbreviations, see the first page of this section.
GG 444 Plate Tectonics (3) (2 Lec, 1 3-hr Lab) Quantitative geometrical analysis techniques of plate tectonic theory; instantaneous and finite-rotation poles; triple-junction analysis; plate-boundary stresses as per OCN 444. Pre: 243 or consent. (Cross-listed as OCN 444) (Alt. years)

GG 450 Geophysical Methods (4) Basic geophysical theories, exploration, and interpretation. Seismic reflection and refraction, gravity, and electromagnetics. Constraints on models of Earth’s internal structure and composition. Pre: 303 and 312, or consent.

GG 451 Earthquakes (3) Earthquake seismology. Elastic properties of rocks, earthquake waves, causes, detection, location, and prediction of earthquakes; tsunami generation and other effects of earthquakes. Pre: 205 or consent. (Alt. years)

GG 454 Engineering Geology (3) Recognition, characterization, evaluation, and assessment of geologic conditions and processes (earthquakes, landslides, wave action, ground subsidence) that impact people, engineering structures, and engineering operations. Group project format. Pre: junior and/or senior standing in CE or GG, or consent.

GG 455 Hydrogeology (4) (3 Lec, 1-3 hr Lab) Occurrence, characteristics, movement, quality, development, and contamination of water in the Earth’s crust. Pre: MATH 206 or consent.

GG 466 Planetary Geology (3) Comparative geology of the terrestrial planets (moon, Mars, Mercury, Venus, and Earth); impact cratering, volcanism, tectonism, geomorphology, weathering; manned and unmanned space exploration. Pre: any 100-level GG course.

GG 491 Teaching Geology (4) For GG majors who lead, under supervision, a freshman seminar section of GG 101. Credit not applicable to major. Pre: senior standing and consent.

GG 499 Undergraduate Thesis (3) Directed research course in which the student carries out a scientific project of small to moderate scope with one or more chosen advisers. The student must complete a document in the style of a scientific journal article. Pre: consent.

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

GG 593 Earth and Planetary Sciences Workshops (V) Designed for in-service school professionals to learn new approaches and concepts in the fields of earth and planetary sciences. Repeatable for credit. Credits earned in these courses cannot be applied for graduate degrees.

GG 600 Equations of Geophysics (3) Least-square approximation of functions by orthogonal series; potential, wave heat flow equations; boundary value problems; Bessel Hankel functions, spherical harmonics, potential theory, plane waves, spherical waves; emphasis on geophysics application. Pre: MATH 252, PHYS 400, or consent.

GG 601 Seminar in Volcanology (2) Types and mechanisms of volcanic action; characteristics of products; sub-volcanic intrusions; distribution in time and space; hazard assessment; and eruption production. Repeatable. Pre: 302 or consent.

GG 602 Theoretical Petrology (4) Derivation of phase diagrams from basic thermodynamics principles. Equilibria of natural silicate systems. Crystal chemistry, kinetics, diffusion, etc., Applied to igneous and metamorphic petrology. Pre: 302, 325, and CHEM 351 (or concurrent); or consent. (Alt. years)

GG 603 Petrology of Ocean Lithosphere (3) (2 Lec, 1-3 hr Lab) Petrogenesis of the oceanic lithosphere, including mantle processes and rocks from mid-ocean ridges, seamounts, oceanic hotspots, back-arc basins, and intra-oceanic arcs. Pre: 302 and 302L. (Alt. years)


GG 608 Isotopes and Trace Elements (3) Principles of radiogenic and stable isotopes, and trace element geochemistry as applied to igneous petrology, mantle dynamics, plate tectonics, and terrestrial evolution. Pre: 302 and 325. (Alt. years)

GG 610 Graduate Seminar (1) Seminar course in which students present a 15- to 20-minute talk on their research or a related topic. Meets once a week with two to three talks per meeting. Graduate students are required to register for this course once per year. Repeatable.

GG 611 Accelerated Introduction to Geology I (3) Lecture course presenting a rapid-paced survey of geology and geophysics for graduate students. Includes origin of the solar system, tectonics, volcanology, whole-earth composition, phase transformations, petrology (igneous, metamorphic, and sedimentary), historical geology, and hydrology. Saturday field trips. Fall only.

GG 612 Accelerated Introduction to Geology II (3) Lecture course presenting a rapid-paced survey of geology and geophysics for graduate students. Includes Earth structure, rheology, seismology, dynamics, origin of continents, global change, energy sources, environmental geology, and natural hazards. Saturday field trips. Spring only.

GG 614 Advanced Field Study (V) Shipboard and land-based projects. Repeatable. Pre: consent.


GG 621 Electron Microprobe Analysis (2) (2 Lec/Lab) Principles of geochemical analysis by electron microprobe and x-ray fluorescence. Hands-on experience with the electron microprobe. Required to operate the UH electron probe. Pre: 301 or consent. (Alt. years)

GG 625 Seminar in Marine Geology and Geophysics (V) Current research topics. Repeatable. Pre: 425 or OCN 622, or consent.

GG 632 (Alpha) Numerical Modeling in Geology (3) Finite difference, finite element, and various other modeling techniques applied to geological and geophysical problems. (B) physical modeling; (C) recursive and time series modeling. Pre: MATH 251 and consent.

GG 638 Earth System Science and Global Change (3) Global view of the planet and how it functions as an integrated unit. Biogeochemical processes, dynamics, and cycles, and analysis of natural and human-induced environmental change. Chemical history of ocean-atmosphere-sediment system and co-evolution of the biota. Repeatable once. Pre: BS in environmentally related science or one year of chemistry, physics, and/or calculus; or consent. (Cross-listed as OCN 638)

GG 641 Origin of Sedimentary Rocks (3) (2 Lec, 1-3 hr Lab) Environments of deposition and subsequent diagenesis of modern and ancient sediments. Petrogenesis of siliciclastic, carbonate and orthochemical rocks. Sedimentology, sedimentary petrography and geochemistry. Repeatable. Pre: consent. (Cross-listed as OCN 641)

GG 642 Elementary Composition Changes (2) Changes in the chemical composition of meteorites, bulk Earth, Earth’s mantle and crust, sedimentary rocks, hydrosphere and biosphere, and underlying principles. Pre: 325 or OCN 623. (Cross-listed as OCN 642) (Alt. years)

GG 644 Sedimentary Geochemistry (3) Geochemical thermodynamics and kinetics and their use in interpreting the origin of sediments, sedimentary rocks, and natural waters over a range of pressure-temperature conditions. Pre: CHEM 171, or CHEM 161 and CHEM 162; PHYS 152; and MATH 206; and consent. (Cross-listed as OCN 644) (Alt. years)

GG 650 Seismology (3) Elasticity, wave equations, body waves, surface waves, free oscillations, seismismology, seismogram interpretation, tectonics, inversion, source theory, and waveform modeling. Pre: 600.

GG 651 Geomagnetism and Cosmic Magnetism (3) Magnetic fields of Earth, planets, stars, and galaxies; dynamo theories; paleomagnetism; terrestrial and lunar rock magnetism; planetary, regional, and local geomagnetic sounding. Pre: consent. (Alt. years)

GG 652 Gravity, Magnetics, Heat Flow (3) Uses of selected potential field and electromagnetic methods in tectonics or in exploration. Processing and interpretation techniques; modeling and inversion. Pre: consent. (Alt. years)

GG 653 Mantle Mineralogy (3) Basic principles of thermodynamics, crystal chemistry, and phase transformation, with emphasis on their relevance to minerals under high pressure/temperature; survey of modern technologies on high pressure research, and evaluation of the proposed mineralogical models for the Earth’s mantle. Pre: consent.

GG 654 Groundwater Contamination (3) Principles of groundwater chemistry; chemical evolution in natural groundwater systems; sources of contamination; mass transport processes; hydrochemical behavior of contaminants. Pre: 455.

GG 655 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. Pre: 455 and MATH 252.

GG 656 Transport Modeling (3) Introduction to the finite-element method; transport of mass and heat in groundwater flow systems; applications to groundwater contamination. Pre: 654 (or concurrent) or 655. (Alt. years)

For key to symbols and abbreviations, see the first page of this section.

GG 666 Planetary Surfaces (3) Comparative geology of terrestrial planets (moon, Mars, Mercury, Venus, and Earth); impact cratering, volcanism, geomorphology; remote sensing; manned and unmanned space exploration. Pre: 601, ASTR 630, or consent. (Alt. years)


GG 669 Formation of the Solar System (3) Nucleosynthesis, collapse of interstellar clouds, accretion of planets, meteorites, asteroids, comets as probes of the early solar system; cosmochemical processes; equilibrium condensation; isotopic anomalies; other solar systems. Pre: 325, ASTR 650, or consent. (Alt. years)

GG 670 (Alpha) Geology of Planetary Bodies (3) Composition and geologic evolution of the planets and their moons; impact cratering; volcanism; tectonism; remote sensing; manned and unmanned exploration and future missions. (B) the moon; (C) Mars. Pre: 660 or consent.

GG 671 (Alpha) Remote Sensing (3) Spectroscopic, radar, thermal, and other methods for remote sensing applied to geologic problems; instrumental design and data analysis. (B) planets; (C) volcanoes. Pre: 666 or consent.

GG 672 Seminar in Tectonics (3) Evolution of ocean basins, margins, foldbelts, and platforms, from plate tectonics and regional syntheses of structure, petrology, geophysics, and stratigraphy. Repeatable. Pre: consent. (Cross-listed as OCN 672) (Alt. years)

GG 673 (Alpha) Extraterrestrial Material (3) Mineralogical and compositional characteristics of extraterrestrial matter and the implications for the origin and history of the solar system. The subject is treated in two full-semester courses: (B) meteorites; (C) petrologic evolution of the moon. Pre: consent.

GG 674 Paleoceneoanography (V) Study of the paleocenographic and paleoclimate evolution of the Earth’s oceans, atmosphere and biosphere. Repeatable. Pre: consent. (Cross-listed as OCN 674)

GG 681 Continuum Mechanics (3) Continuum mechanics in geophysics, planetary physics, and structural geology. Tensors; stress, strain, flow; conservation of mass, momentum, and energy; rheology, geophysical fluid dynamics. Pre: PHYS 400, MATH 402, or consent.

GG 685 Geophysical Inverse Theory (3) Least squares, the generalized inverse, singular value decomposition, maximum likelihood, Backus-Gilbert, Franklin, and Tarantula methods; applications. Pre: 600 or consent. (Alt. years)

GG 691 Geological Data Analysis II (3) Analysis of sequential data; Markov processes, series of events, spectral analysis, filtering, quantitative map analysis, and introduction to fractals. Pre: 313 and MATH 205, or consent.

GG 699 Directed Research (V) CR/NC only. Pre: consent.

GG 700 Thesis Research (V)

GG 701 Physics of the Earth's Interior (3) Interpretation of geophysical and laboratory data to understand elastic and anelastic properties, composition, phase relationships, temperature distribution in the Earth. Pre: 653 or consent. (Alt. years)

GG 710 Selected Topics in Geology and Geophysics (2) Content to be announced. Repeatable. Pre: consent.

GG 711 Special Topics in Geology and Geophysics (3) Content to be announced. Repeatable. Pre: consent.

GG 733 Seminar in Igneous Petrology (2) Current research on the generation, differentiation, and emplacement of magmas. Pre: 603 and consent. (Alt. years)

GG 734 Seminar in Metamorphic Petrology (2) Current research on the application of phase diagrams to metamorphism. Relation to metamorphism with tectonic setting. Pre: 602. (Alt. years)

GG 735 Seminar in Geochemistry I (2) Selected topics of current geochemical research; application to geologic problems. Pre: 302 and 325, or consent. (Alt. years)

GG 800 Dissertation Research (V)

German (GER)

College of Languages, Linguistics and Literature

ALL COURSES ARE CONDUCTED IN GERMAN.

GER 101 Elementary German (4) Conversation, lab drill, grammar, reading. FL

GER 102 Elementary German (4) Continuation of 101. FL

GER 201 Intermediate German (3) Reading, conversation, lab drill, composition. Pre: 102. FL

GER 202 Intermediate German (3) Continuation of 201. Pre: 201. FL

GER 203 German Phonetics (3) Exercises in German pronunciation, reading, speaking, lab exercises. Pre: 102. May be taken concurrently with 201 or 202.

GER 204 Intermediate German: Business and Related Fields (3) Intermediate German conversation, reading, and writing with a special emphasis on the vocabulary and cultural context of the German business world. Pre: 201. FL

GER 211 Intermediate German: Scholarly Readings (3) General and individual practice in comprehending scholarly readings in German. Pre: 102. Also open to graduate students by consent. FL

GER 212 Intermediate German: Scholarly Readings (3) Continuation of 211. Pre: 201 or 211. Also open to graduate students by consent. FL

GER 258 Intermediate German Abroad (3) Intensive course of formal instruction on the third-year level in German language and culture in Germany. Pre: 202 or 259.

GER 359 Third-Level German Abroad (3) Continuation of 358. Pre: 358.

GER 361 Introduction to German Civilization (3) German cultural heritage and contemporary German civilization in Austria, Germany, and Switzerland. Pre: 305 (or concurrent).

GER 371 Practical German for use in Hawai‘i (3) Use of German in practical situations in Hawai‘i, e.g., in travel industry. Pre: 305 (or concurrent).

GER 401 German Literary Criticism (3) Role of literary criticism, function of literature, literary techniques, and German schools of literary theories. Pre: 312 or 315.

GER 407 Early German Literature to 1500 (3) Beginnings, mythology, and literary documents; courtly literature, including Wolfram’s Parzival; lyrics of Minnesingers; heroic epic, mysticism, and church drama. Pre: 306 or consent.

GER 408 German Literature from 1500 to 1700 (3) Reformation, humanism; folksong chabtophubs, popular theater, early novel, baroque poetry, drama, novel. Pre: 306 or consent.

GER 409 Enlightenment—Sturm und Drang (3) Lessing and his contemporaries; early dramas of Goethe and Schiller; Goethe’s early lyrics. Pre: 306 or consent.

GER 410 Classicism (3) Classical writings of Goethe and Schiller; some reference to other writers. Pre: 306 or consent.

GER 411 Romanticism (3) Novalis, Tieck, E. T. A. Hoffmann, Eichendorff, etc. Pre: 306 or consent.

GER 412 Poetic Realism (3) Masterworks by Büchner, Raabe, Storm, Keller, Meyer, Hebbel, and others. Pre: 306 or consent.

GER 413 German Literature from 1880 to 1950 (3) Theater, prose, poetry exemplifying literary currents from naturalism to expression-
ism and Nullpunkt literature. Hauptmann, Rilke, Trakl, Kafka, Brecht, Böll, etc. Pre: 306 or consent.

**GER 415 Contemporary German Literary Activity** (3) Handke, Becker, Weiss, Bernhard, Walser, Böll, Grass. Pre: 306 or consent.

**GER 428 Survey of German Lyric Poetry** (3) Individual interpretation complements lectures on theoretical and historical background. Pre: 306 or consent.

**GER 432 Stylistics** (3) Analysis of prose selections through identification of their structural and semantic elements. Written and oral styles; specific structural elements and their semantic effect. Pre: 306 and 315.

**GER 451 Introduction to the History of German Language** (3) Survey of important developments from beginnings to present. Pre: 315 or consent.

**GER 452 Introduction to Middle High German** (3) Introduction to phonology and morphology with selected readings. Pre: 315 or consent.

**GER 458 Fourth-Level German Abroad** (3) Intensive course of formal instruction on the fourth-year level in German language and culture in a German speaking country. Pre: 6 credits of third-year German or consent.

**GER 459 Fourth-Level German Abroad** (3) Intensive course of formal instruction on the fourth-year level in German language and culture in a German-speaking country. Pre: 6 credits of third-year German.

**GER 609 Middle High German** (3) Grammar, syntax, phonetics, rhythm, meter, reading.

**GER 610 Middle High German** (3) Emphasis on literature.

**GER 615 History of the German Language** (3) Development from Middle High German to present; fundamentals of linguistics.

**GER 616 History of the German Language** (3) Development from the beginnings through the Old High German period. Pre: 615 or consent.

**GER 432 German Stylistics** (3) Concepts of style and stylistics, descriptive and applied stylistics; stylistic phenomena in texts and methods of assessing style.

**GER 650 Seminar: The German Essay** (3) Development as exemplified by works from various periods.

**GER 651 Seminar: The German Novel** (3) Discussion of representative works from end of 18th century to 1955.

**GER 652 Seminar: German Drama** (3) Development of dramatic theory and literature as exemplified by typical works of literary periods.

**GER 653 Seminar: Lyric Poetry** (3) Comparative study of works of representative German poets.

**GER 654 Seminar: The German Novel** (3) Novels representative of a period, movement, or author.

**GER 655 Faust** (3) Short history of Faust theme; Goethe’s dramatic poem.

**GER 699 Directed Research (V)** Pre: consent of department chair.

**GER 735 Seminar (3)** Study of authors, topics, a genre, or a period. Repeatable. Pre: consent of chair of graduate field.

**GG**

See Geology and Geophysics

**Greek (GRK)**

**GRK 101 Elementary Greek** (3) Grammar and vocabulary, with reading of simple Greek. FL

**GRK 102 Elementary Greek** (3) Continuation of 101. FL

**GRK 201 Intermediate Greek** (3) Development of reading and translation skills. Emphasis on prose. Pre: 102 or equivalent. FL

**GRK 202 Intermediate Greek** (3) Continuation of 201. Emphasis on poetry. FL

**GRK 303 Greek Historians** (3) Selections from Herodotus, Xenophon, and others. Pre: 201 and 202, or consent.

**GRK 304 Greek Epic** (3) Selections from Homer, Hesiod, and others. Pre: 201 and 202, or consent.

**GRK 425 Greek Philosophy** (3) Selections from Plato, Aristotle, and others. Pre: 303 and 304, or consent.

**GRK 432 Greek Drama** (3) Selections from Aeschylus, Sophocles, and Euripides. Pre: 303 and 304, or consent.

**GRK 433 Greek Lyric** (3) Selections from Sappho, Alcaeus, and others. Pre: 303 and 304, or consent.

**GRK 490 Seminar in Greek Studies** (3) Study of an author or phase in Greek studies. Repeatable. Pre: 303 and 304, or consent.

**GRK 650 History of Greek Literature** (3) Literature from Homer through Lucian. Pre: graduate standing or consent.

**GRK 651 Seminar in Greek Literature** (3) Study of an author, genre, period, or work. Repeatable. Pre: graduate standing or consent.

**GRK 699 Directed Research (V)** Pre: consent of department chair.

**HAW 101 Elementary Hawaiian** (4) Listening, speaking, reading, writing. Meets five hours weekly; daily lab work. FL

**HAW 102 Elementary Hawaiian** (4) Continuation of 101. FL

**HAW 105 Intensive Elementary Hawaiian** (8) Content of 101 and 102 covered in one semester. Meets two hours daily, plus lab work. Pre: 102 or equivalent. FL

**HAW 131 Hawaiian for Reading Proficiency** (3) Elementary course; emphasis on reading and translation.

**HAW 132 Hawaiian for Reading Proficiency** (3) Continuation of 131.

**HAW 201 Intermediate Hawaiian** (4) Continuation of 102. Meets five hours weekly; reading of traditional texts; daily lab work. Pre: 102 or equivalent. FL

**HAW 202 Intermediate Hawaiian** (4) Continuation of 201. FL

**HAW 206 Intensive Intermediate Hawaiian** (8) Content of 201 and 202 covered in one semester. Meets two hours daily, plus lab work. Pre: 102 or 105, or exam. FL

**HAW 261 Hawaiian Literature in Translation** (3) Survey of Hawaiian literature, including prose narration and poetry with reference to Polynesian and Western themes and forms. AH3


**HAW 302 Third-Level Hawaiian** (3) Continuation of 301. Pre: 301.

**HAW 321 Hawaiian Conversation** (3) Systematic practice on various topics for control of spoken Hawaiian. Repeatable up to 6 credit hours. Pre: 202.

**HAW 331 Hawaiian Composition** (3) Intensive work in the grammatical, semantic, and pragmatic dimensions of composition writing in Hawaiian. Pre: 202.

**HAW 332 Listening Comprehension and Transcription** (3) Development of listening comprehension through transcription and discussion of tape recordings. Pre: 202.

**HAW 373 Ka Mo’omehu Hawai’i** (3) A survey course on the study of traditional Hawaiian culture including origins, the socioeconomic system, land tenure, religion, values, and the arts. The course will be taught in Hawaiian. Pre: 302 (or concurrent); or consent.


**HAW 402 Fourth-Level Hawaiian** (3) Continuation of 401.

**HAW 425 Mo’olelo Hawai’i** (3) Survey of the major works by Hawaiian scholars writing about the history and culture of Hawai’i including David Malo, Kamakau, Kepelino, and John Papa II. Pre: 302.

**HAW 426 Ka’ao Hawai’i** (3) Survey of the core literature written by Hawaiian scholars, including both historical and mythological epics and folk tales. Pre: 302.

**HAW 435 (Alpha) Problems in Translation** (3) Problems in translation of: (A) legal documents; (B) newspapers; (D) religious writings. Pre: 302 or consent.

**HAW 452 Structure of Hawaiian** (3) Descriptive linguistic analysis. Intensive exercises in advanced grammar. Pre: 202 and LING 102, or consent.

**HAW 454 History of the Hawaiian Language** (3) Development from proto-Polynesian. Phonology, morphology, and grammar; history of research. Pre: 202 and 452, or consent.

For key to symbols and abbreviations, see the first page of this section.
**HAW 463 Language for the Classroom (3)**
Examination of language needs in various classroom settings and introduction to new vocabulary in school content areas. Pre: 302, 452, and consent.

**HAW 466 Kuleana Kula Kaiapuni (3)**
Examination of the political struggles of the Kula Kaiapuni (Hawaiian Immersion Program) - past and present. Special attention given to federal and state governments, Department of Education, and internal political struggles. Pre: 401 (or concurrent with consent).

**HAW 470 Hoʻomōhāla Haʻawina Kaiapuni Curriculum Development (3)**
Examination of curricular issues of indigenous language programs; weekly participation in an immersion classroom; development of materials. Repeatable once. Pre: 302 or consent.

**HAW 484 Hawaiian Poetry (3)**
Historical survey and analysis of poetry found in traditional chants, folk songs, modern poetry written in Hawaiian. Interpreting and composing Hawaiian poetry. Pre: 402, or 302 and consent.

**HAW 490 Ka Makauʻolele Aʻo Kula Kaiapuni Hawaiʻi (1)**
This course will assess the linguistic competence of prospective Hawaiian language immersion teachers to assure that all teachers entering the state DOE Hawaiian Immersion Program meet the requirements of the program with respect to Hawaiian language proficiency. CR/NC only. Pre: 401, 402 (or concurrent), and 463 (or concurrent); or consent.

**HAW 499 Directed Studies (V)**
Study of Hawaiian language through vernacular readings in various academic fields. Repeatable up to 6 credits. Pre: 302 and consent.

**Hawaiian Studies (HWST)**
School of Hawaiian, Asian, and Pacific Studies

**HWST 107 Hawai‘i: Center of the Pacific (3)**
An introduction to the unique aspects of the native point of view in Hawai‘i and in the larger Pacific with regards to origins, language, religion, land, art, history, and modern issues. AH2

**HWST 107A Hawai‘i: Center of the Pacific (3)**
An introduction to the unique aspects of the native point of view in Hawai‘i and in the larger Pacific with regards to origins, language, religion, land, art, history, and modern issues. AH2

**HWST 270 Hawaiian Mythology (3)**
Survey of gods, ‘aumakua, kupu, mythical heroes, heroines, and their kino lau as the basis of traditional Hawaiian metaphor. Pre: HWST 107 or HAW 102.

**HWST 301 Perspectives in Hawaiian Studies (3)**
Interdisciplinary lectures and discussions examining traditional and contemporary experiences in Hawaiian society and setting; resources, methods, and techniques. Pre: HAW 202 or consent.

**HWST 341 Hawaiian Genealogies (3)**
Survey of major Hawaiian chiefly lineages from the four main islands: Hawai‘i, Maui, O‘ahu and Kaua‘i. Political history from the Kumuhi‘i to Western contact. Pre: HAW 202.

**HWST 342 Chiefs of Post-Contact Hawai‘i (3)**
Survey of Hawaiian chiefs from 1778 to the present, including genealogy, political function, and historical impact. Pre: 107, 541, or HAW 201.

**HWST 343 Myths of Hawaiian History (3)**
Thematic exploration of some common myths of Hawaiian history, including infanticide, slavery, feudalism, constant warfare, human sacrifice, and a limited pre-contact population, to determine the role of myth making in perceptions of Hawaiian history. Pre: junior standing or consent.

**HWST 362 Pana O‘ahu: Famous Place Names (3)**
A survey of the famous place names in each ‘ahu‘āna of O‘ahu, including accounts of mythical heroes, heiau, fishponds, wind, rain names, and their metaphoric value in Hawaiian literature. Pre: 107, 270, or GEOG 101; and HAW 202.

**HWST 390 Issues in Modern Hawai‘i (3)**
Cultural and political aspects of the current Hawaiian movement; historical colonization; conflicts over tourism, the military, and agriculture; forms of native self-determination. Pre: junior standing or consent.

**HWST 440 Mahéle Land Awards (3)**
Practical guide to the researching of land awards and change in title for a single ‘ahupua‘a, 1848 to present. Focus on field trips. Pre: 342.

**HWST 445 Hawaiian Institutions (3)**
Comprehensive analysis of institutions like Bishop Estate/Kamehameha Schools, OHA, Lili‘uokalani Trust, Department of Hawaiian Home Lands and The Queen’s Hospital. Pre: 342.

**HWST 490 Senior Seminar in Hawaiian Studies (3)**
Critical examination of existing research; individual or team development, execution, and evaluation of selected projects. Pre: senior major in Hawaiian studies or consent.

**HWST 499 Directed Reading/Research (V)**
Individual reading/research. Pre: 301, two upper division Hawai‘i-related courses, and consent.

**Health, Physical Education, and Recreation (HPER)**
See Kinesiology and Leisure Sciences

**Health Sciences and Social Welfare (HSSW)**
College of Health Sciences and Social Welfare

**HSSW 477 Southeast Asian Cultures in Health/Social Welfare (3)**
The study of cultures and their implications in the health and social welfare context for a number of countries in Southeast and South Asian region.

**HSSW 478 Pacific Cultures in Health/Social Welfare (3)**
The study of cultures and their implications in the health and social welfare context for a number of countries in the Pacific region.

For key to symbols and abbreviations, see the first page of this section.
HIST 402 Modern Philippines (3) Survey of major developments from pre-colonial through Spanish and American colonial periods, the revolution, Japanese occupation, and post-war republic. Pre: 151 and 152, or 161A and 162A; or consent.

HIST 407 Modern Malaysia (3) History of Malay peninsula and northern Borneo, emphasizing developments since 18th century: trade, commerce, foreign migrations, pluralism, nationalism, and Islam. Pre: 151 and 152, or 161A and 162A; or consent.

HIST 408 Modern Indonesia (3) Indonesia from 14th century to present. Emphasis on period from late 18th-century Western colonial impact to struggle for independence and problems of nationhood. Pre: 151 and 152, or 161A and 162A; or consent.

HIST 409 Modern Indochina (3) General survey of the history of the Indochinese countries. Emphasis on the struggle for independence. Pre: 151 and 152, or 161A and 162A; or consent.

HIST 411 Local History of Late Imperial China (3) China government and Chinese society from local and regional perspectives: modes of control and disorder during the 19th century.

HIST 412 Local History of 20th-Century China (3) Sociopolitical change and continuity at local and regional levels since 1900, stressing provincial reform, Hsien and sub-Hsien politics, warlordism, Kuomintang tutelage, and the Chinese Communist movement and rule.

HIST 416 Chinese Intellectual History (3) An interpretive survey of Chinese ideas and values in their cultural, social and political settings from classical age to 1600. Pre: 241 and 242; or consent.

HIST 417 Chinese Intellectual History (3) Interpretive survey of Chinese thought from 1600 to the contemporary period, with special emphasis on the themes of cultural collision and change and tradition. Pre: 241 and 242; or consent.

HIST 418 China's Foreign Relations (3) Systematic review from traditional times, with emphasis on modern and contemporary history, analyses of foreign policy formulation, objectives, and implementation. Recommended: 312.


HIST 420 People's Republic of China (3) Salient developments from 1949 to the present. Social revolution and modernization, critically relevant foreign relations. Recommended: 312 or 419.

HIST 421 Japanese Cultural History to 1600 (3) Genesis and development of Japanese aesthetic and literary traditions prior to founding of the Tokugawa Shogunate. Recommended: 321.


HIST 423 Okinawa (3) Survey of social, cultural, economic, and political history from earliest times to present.

HIST 424 20th-Century Japan (3) Problems of Japan's political, economic, and social development since institutional consolidation of Meiji state (c.1890). Pre: 321 or 322, or consent.

HIST 425 Women in Japanese History (3) Survey of the changing political, social, economic, and cultural positions of women in Japan from ancient times to the present. Pre: one course in Japanese history or consent.


HIST 432 Crisis and Conflict in the Middle East (3) In depth study and analysis of major crises and conflicts in the Middle East since World War II: the Arab-Israeli Wars, revolts in the Arab countries, the Turkish experiment with secularism, the Iranian/Islamic revolution, Afghanistan, the Gulf War. Recommended: 354 or 355.

HIST 433 Medieval Cultures (3) Topical study of cultural and cross-cultural issues in the medieval period (c. 500-1500). Class discussion and written work emphasize analysis of primary source documents using cultural and world history theories. Regional focus and readings vary by semester. Repeatable once. Pre: upper-division standing; 151 and 152, or 161A and 162A; or consent.

HIST 434 History of Christianity to 1500 (3) Historical analysis of the main traditions of Christianity and elements of diversity within Europe and in relation to other parts of the world. Focus on the interpretation of primary sources and discussion of cultural issues. Pre: 151 and 152, or 161A and 162A. (Alt. years: spring/2000)

HIST 435 The Renaissance 1300–1500 (3) Political, social, intellectual, and religious development. Emphasis on cultural history: humanism and its influence on thought and reforming movements. (Alt. years: fall 2007)

HIST 436 The Reformation 1500–1600 (3) Political, social, intellectual, religious developments of Protestant and Catholic Reformation. Emphasis on cultural history; religious thought and impact on the development of political developments. (Alt. years: spring)

HIST 437 The Darwinian Revolution (3) Social and intellectual origins of evolutionary thought and its continuing impact; emphasis on Darwin and the Victorian scientific community. Pre: 152 and one of BOL 101, BOT 101 or ZOOL 101; or consent.

HIST 440 20th-Century Europe (3) Contemporary problems and their historical background.

HIST 441 Expansion of Europe (3) Historical processes in modern European colonization from 16th to 20th century; impact on non-Europeans in Asia and Africa. (Alt. years: fall)

HIST 443 Nazi Germany (3) Origins, establishment, and impact of Hitler's Third Reich. Recommended: 344. (Alt. years: spring)

HIST 444 The History of the Holocaust (3) The origins and progression of the Holocaust, the almost complete destruction of European Jews, and other Nazi genocidal policies. Open to non-majors.

HIST 445 French Revolution and Napoleon (3) Causes, course, and conduct of the Revolutionary and Napoleonic periods, their impact upon Europe; emphasis on the conflict of ideologies inherent in the Revolutionary process.

HIST 448 Imperial Spain and Portugal (3) The influence of Spain and Portugal on people and cultures in Europe, Africa, America, and Asia; Portugal's captivity and the defeat of the Spanish Armada.

HIST 453 Russian Intellectual History (3) Evolution of political/cultural ideas in 19th- and early 20th-century Russia. Pre: 350 or consent.

HIST 454 Tsarist Russia (3) Development of the Russian state to the 19th century. Kievan states and early development of culture and art; Mongol era; rise of Moscow; autocracy, and serfdom; Petrine reforms; Western impact; emergence as a major European power.

HIST 455 Russian Revolution (3) Origins in 19th-century; problems in Russian society; revolutionary ideologies and parties. Revolu- tion of 1917 and the civil war; detailed study of relation between February and October revolutions.

HIST 456 Soviet Union (3) Establishment, political structure, economic system, society and culture, foreign policy. Characteristics, impact on its peoples, problems, post-Stalin “thaw.”

HIST 457 Russia in East Asia and the Pacific (3) Siberia, Russian/Soviet Far East, Russian activities in Pacific basin; evolving relations with Asian and Pacific powers.

HIST 461 Early America (3) Transit of European culture to North America; independence and the Constitution.

HIST 462 The Young American Republic 1785–1814 (3) Development of American society, the Constitution, Jeffersonianism, the age of Jackson.

HIST 463 American Civil War Era 1841–1877 (3) The crisis of the Union: antebellum society and culture, slavery, reform, sectionalism, the Civil War and Reconstruction.

HIST 464 Transformation of America 1877–1920 (3) Selected themes that explain major changes in American life during the late 19th and early 20th centuries, including the westward movement, consolidation of capitalism, world power diplomacy, popular culture, progressivism, and World War I.

HIST 465 The United States 1920–1948 (3) The Roaring Twenties, the Depression, New Deal, coming of World War II, America during the war, origins of the Cold War.

HIST 466 The U.S.: 1948 to the Present (3) The atomic age and the Cold War, the age of anxiety, the 1960s, the Vietnam War, the Reagan-Bush era, and beyond.

HIST 467 American Television History (3) A lecture/discussion course examining the impact of television on American society, culture and politics. Analyzed in depth are family sitcoms, presidential politics, Vietnam and the presentation of gender and ethnicity. Open to nonmajors.

HIST 470 American Show Business (3) History of American entertainment industry since 1880, with emphasis on businesses of recording, broadcasting, and film production.

For key to symbols and abbreviations, see the first page of this section.
Role of entrepreneurs, invention, labor, politics, and culture. Impact of industry on American life. Pre: consent.

HIST 472 American Social History (3) Introduction to the new social history; interdisciplinary approaches to the study of the everyday lives of ordinary Americans in past generations. Pre: 281 and 282.

HIST 474 (Alpha) Topics in United States History (3) (B) African Americans; (C) the West. (474C cross-listed as AMST 414)

HIST 475 Constitutional History of the U.S. (3) Origins, development of Constitution, Colonial to modern times.

HIST 477 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 AMST 431)

HIST 478 Colonial Latin America (3) Pre-Columbian civilizations: Spanish and Portuguese colonization; political, economic, social, and religious evolution to 1810; independence.

HIST 479 Latin America since Independence (3) Political, economic, and social development since 1825; case studies from Brazil, Mexico, and Cuba.

HIST 481 Pacific Islands I (3) The Pacific past from first human settlement to the start of the colonial period; emphasis on historiography and analysis of islanders’ responses to Euro-American intrusion.

HIST 482 Pacific Islands II (3) The colonial experience to the present.

HIST 483 United States in the Pacific (3) Growth of economic and political interests and policies.

HIST 484 The Hawaiian Kingdom 1819–1893 (3) Transformation of Hawai‘i into a state influenced by American and European ideas and institutions and Asian peoples. Pre: 284.

HIST 485 History of 20th-Century Hawai‘i (3) Formation of an American Hawai‘i with its unique local culture from 1808 to the present. Pre: 284.

HIST 489 World Maritime History (3) A survey of world maritime history from earliest times to the present, with emphasis on the evolution of nautical technology, motives from maritime enterprises, and the impact of cross-cultural encounters between oceanic peoples. (Cross-listed as OEST 489)

HIST 491 Woman’s Place (3) Historical explanations of women’s proper place and roles in the home, outside, and in the struggle for emancipation. (Cross-listed as WS 491)

HIST 492 Women in Revolt (3) Conditions under which women’s protest develops. Women’s rights movements in the 19th- and 20th-century U.S., cross-cultural comparisons. Recommended: 491. (Cross-listed as WS 492)

HIST 495 (Alpha) History Colloquium (3) Extensive or intensive treatment of special problems. (B) Philippines and Indonesia; (C) intelligence and foreign relations; (K) Chinese traditional government. Recommended for honors students. Pre: 372 (or concurrent) or consent for (C); consent for (B) and (K).

HIST 496 (Alpha) Senior Tutorial in History (3) Analysis of sources and evaluation of methods of historical writing. Research in field of special interest. Required for majors except those in Honors Program. (B) United States; (C) modern Europe; (D) Asia/Pacific; (E) comparative/World; (F) provisional topics. Pre: 396 (or concurrent).

HIST 499 Directed Reading (V) Individual projects in various fields. History majors with consent. Maximum 5 credit hours. (1) American; (2) Pacific; (3) Japanese; (4) European; (5) English; (6) Chinese; (7) Russian; (8) Hawaiian; (9) South Asian; (10) Southeast Asian; (11) Korean.

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

HIST 602 Seminar in Historiography (3) History of history and historians; philosophies of history.

HIST 609 Seminar in World History (3) Analysis, research, and discussion of themes and issues in study of history of humankind. Repeatable. Pre: graduate standing or consent.

HIST 610 Topics in World History (3) Selected themes — economic, political, and industrial development, etc. — important in global history. Topics pre-announced. Repeatable. Pre: 609.

HIST 611 (Alpha) Seminar in European History (3) Selected problems for reading and research. (B) ancient; (C) medieval (Pre: 355 or 356, or consent); (D) early modern (Alt. years: spring); (E) modern (Alt. years: fall); (G) intellectual

HIST 612 Ethnographic History (3) Critical inquiry into historical representations of the “other” and ways in which modern historians have used culture and other anthropological concepts to write and think about the past.

HIST 613 Introduction to Cultural Studies (3) A graduate seminar designed to introduce history students to the multidisciplinary theories that are appropriate to cultural studies. A-F only. Repeatable once. Pre: history major or consent.

HIST 618 (Alpha) Advanced Readings in Russian History (3) (B) early Russia; (C) modern. Pre: 350 and graduate standing, or consent.

HIST 619 Research Seminar in Russian History (3) Repeatable. Pre: 618 and knowledge of Russian language, or consent.

HIST 620 Advanced Topics in Russian History (3) Seminar. Repeatable. Pre: appropriate 400-level Russian history or consent.

HIST 621 (Alpha) Russia in East Asia and the Pacific (3) (B) advanced readings; (C) advanced research on Siberia; Russian activities in the Pacific basin, evolving relations with Asian and Pacific powers. Repeatable. Pre: 457 and either 454 or 456; or consent.


HIST 632 (Alpha) Advanced Readings in American History (3) Interpretations and literature of important themes and problems. (B) early America; (C) the Republic to 1877; (D) industrial America; (E) recent America. Repeatable. Pre: appropriate 400-level U.S. history course or consent.

HIST 634 (Alpha) Research in American History (3) (B) early America; (C) the Republic to 1877; (D) industrial America; (E) recent America; (F) foreign relations. Repeatable. Pre: for 634(F) only, 639(C); for all others, appropriate 400-level U.S. history course or consent.

HIST 639 (Alpha) Advanced Topics in American History (3) Seminar in advanced research and readings. (B) social and intellectual (Cross-listed as AMST 646); (C) diplomatic; (D) religious (Cross-listed as AMST 644); (E) the American city (Cross-listed as AMST 627 and ARCH 627), (K) business, labor, and technology (Cross-listed as AMST 647). Pre: graduate standing and consent.


HIST 661 (Alpha) Seminar in Chinese History (3) Problems and readings in political, social, and cultural history. (B) early; (C) middle; (D) modern. Repeatable.

HIST 662 Seminar: Islam and Islamic Civilization (3) Readings on the rise, spread, and development of Islamic cultures and civilizations throughout the world down to modern times. Repeatable. Pre: graduate standing or consent. Recommended: 354.

HIST 663 Seminar in Indian History (3) Problems and readings; influence of Indian culture on Southeast Asia. Individual reports. Repeatable.

HIST 665 (Alpha) Seminar in Japanese History (3) Problems, principal sources of bibliographic information. (B) traditional period to c. 1600; (C) early modern 1600–1868; (D) 1868 to present; (E) 20th-century diplomatic.

HIST 667 (Alpha) Seminar in Korean History (3) Reading major interpretive works, and research in selected topics. (B) reading; (C) research. Pre: 327 and 328.

HIST 675 (Alpha) Seminar in Pacific History (3) Reading and research on major themes and issues. (B) South Pacific; (C) Micronesia; (D) 19th century; (E) 20th century. Pre: 481 and 482, or consent.


HIST 680 Seminar in Military History (3) Bibliography, research tools, readings, and special problems in military history. Repeatable. Pre: graduate standing or consent.

HIST 690 Seminar in History of Science (3) Readings in the history of science and its social context. Repeatable.

For key to symbols and abbreviations, see the first page of this section.
HIST 699 Directed Research (V) Individual research topics. (1) American; (2) Pacific; (3) Japanese; (4) European; (5) English; (6) Chinese; (7) Russian; (8) Hawaiian; (9) South Asian; (10) Southeast Asian; (11) Korean. Restricted to Plan A (thesis) students. Maximum 2 credit hours. Repeatable. Pre: consent.

HIST 700 Thesis Research (V)

HIST 702 Institutional History of Korea (3) Major political, economic, and social institutions. Repeatable. Pre: 327 and 328. (Alt. years: spring)

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

HIST 711 Korean Historical Sources (3) Reading in Korean or classical Chinese of various forms of historical literature, literary sources, reference materials; reading knowledge of Korean or classical Chinese required. Repeatable. (Cross-listed as KOR 711) (Alt. years: fall)


HIST 718 Chinese Intellectual History (3) Continuation of 717. Repeatable.


HIST 723 China from 750–1700 (3) Political, social, economic history; source materials; interpretive problems, rise of the dynasty. Pre: knowledge of Chinese. Repeatable.

HIST 725 Contemporary China Seminar: Reading (3) Topical readings, research, and discussion, emphasizing modern. Normal sequence emphasizes reading in 725, research in 726. Repeatable. (Cross-listed as ASAN 725)

HIST 726 Contemporary China Seminar: Research (3) Continuation of 725. Repeatable.

HIST 800 Dissertation Research (V) Pre: consent.

HON 120 Mathematical Modes of Thinking (3) Mathematics as both a language and a thought process expressed in that language. Historical and contemporary relations to culture.

HON 130 Contemporary Writing (3) Expository writing: classroom discussion of written products; introduction to debate. Limited to entering Honors Programs students.

HON 131 Disciplinary Reading and Writing (3) Writing about reading. Emphasis on various discourses associated with the common academic disciplines. Pre: 130.


HON 133 Varieties of Literary Experience (3) A far-ranging survey of world literature from Homer to the present. Development of critical skills. Pre: 132.

HON 140 Structure in Music and Dance (3) Examining the languages of the musical arts. Emphasis upon the ways these arts are created and put together.

HON 170 Persons and Society (3) Interdisciplinary examination of the various branches of social science and their relation to each other and to society as a whole.

HON 171 Persons and Society (3) Interdisciplinary examination of the various branches of social science and their relation to each other and to society as a whole. Pre: 170.

HON 180 Values: Origins and Significance (3) Interdisciplinary examination of the origins of various values in different cultures and periods. Status and roles of values in contemporary society.

HON 181 Values: Origins and Significance (3) Interdisciplinary examination of the origins of various values in different cultures and periods. Status and roles of values in contemporary society. Pre: 180.

HON 491 Senior Honors Seminar (3) Students from different disciplines meet weekly for discussion of material presented by instructor in a multi-disciplinary format. Topics vary each semester. Required of, and limited to, candidates for Honors degree. CR/NC only.

HON 492 Honors Colloquium (3) Weekly meetings for discussion of enduring issues and problems of an interdisciplinary nature. Required of, and limited to, candidates for Honors degree. CR/NC only.

HON 493 Senior Honors Thesis (2) Preparation of research paper under individual faculty supervision. Required for graduation with Honors. Repeatable in different major.

HON 494 Senior Honors Thesis (2) Preparation of research paper under individual faculty supervision. Required for graduation with Honors. Repeatable in different major.

HON 495 Introduction to Research (V) Library research skills; lectures on research within a university setting; methodological issues for and across disciplines; special attention to defining a specific research problem. Required of, and limited to, candidates for the Honors degree.

HON 496 Senior Honors Project (3) Preparation of a research project or a performance project (with a research component) supervised by a faculty member. Required of, and limited to, candidates for Honors degree. Repeatable once. Pre: 495.

Horticulture (HORT)

College of Tropical Agriculture and Human Resources

HORT 200 Introduction to Crop Science (3) Relation of plants, nutrients, environment, cultural practices to crop production. Pre: BOT 101 and CHEM 151 (or concurrent). (Cross-listed as AGRN 200)

HORT 300 Horticulture Production Systems (4) (3 Lec, 1 3-hr Lab) Comparisons and contrasts of crop management systems, techniques, and technologies in protected and open field production of horticultural crops. Pre: 200 or consent.

HORT 350 Tropical Landscape Horticulture (3) (2 Lec, 1 3-hr Lab) Concepts and techniques of landscape design and maintenance in the tropics. Pre: 200 and 369.

HORT 361 Horticultural Practices (2) (1 Lec, 1 3-hr Lab) Techniques of culture and management of horticulture crops. Pre: 200 (or concurrent).

HORT 369 Ornamental Plant Materials (3) (2 Lec, 1 3-hr Lab) Identification, origin, use, and cultural requirement of trees, shrubs, vines, and groundcovers used in Hawaiian landscapes. Pre: 200.

HORT 401 Vegetable Crop Production (3) (2 Lec, 1 3-hr Lab) Crop biologies, requirements, and production techniques for commercial vegetable production in Hawai‘i will be stressed. Pre: 300 or consent.

HORT 402 Flower Crop Production (3) Biology and production of cut flowers and blooming potted plants under field and protected cultivation in Hawai‘i and globally. A–F only. Pre: 300 or consent.

HORT 403 Fruit Crop Production (3) (2 Lec, 1 3-hr Lab) Botanical aspects and horticultural management practices of selected tropical and subtropical fruit crops. With emphasis on small scale commercial production in Hawai‘i. Pre: 300 or consent.

HORT 404 Foliage Crop Production (3) (2 Lec, 1 3-hr Lab) Combined lecture-lab course on foliage crop production in Hawai‘i. Crop biology, requirements and production techniques. Pre: 300 or consent.

HORT 420 Plant Propagation (3) (2 Lec, 1 3-hr Lab) Theoretical and applied aspects of seed and vegetative propagation technology involving fruits, flowers, vegetables, and landscape plants. Pre: 200.

HORT 430 Nursery Management (3) (2 Lec, 1 3-hr Lab) Management practices in production and operations of commercial nurseries in Hawai‘i. Pre: 200.

HORT 440 Tissue Culture (3) (2 Lec, 1 3-hr Lab) Application of plant tissue culture for horticulture; study of growth and development of plant tissues as influenced by chemical and environmental factors. Pre: 420 or consent. Recommended: BOT 410.

HORT 453 Plant Breeding (3) (2 Lec, 1 3-hr Lab) Application of genetics to crop improvement, breeding methods, breeding of plants in Hawai‘i. Pre: BIOL 375.

For key to symbols and abbreviations, see the first page of this section.
HORT 460 Turfgrass Management (3) (2 Lec, 1 3-hr Lab) Selection, establishment, and maintenance of grasses for various types of turf. Pre: 200.

HORT 470 Principles of 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. Pre: CHEM 152 and BIOL 171; or consent. Co-requisite: 470L. (Cross-listed as BOT 470)

HORT 470L Principles of Plant Physiology Lab (1) (1 3-hr Lab) Principles of experimentation in plant physiology, includes individual investigations. Co-requisite: 470. (Cross-listed as BOT 470L)

HORT 475 Post-Harvest Physiology (3) Comparative physiological and biochemical processes during growth, maturation, ripening, and senescence in fruits, vegetables, and flowers related to changes in quality and storage life. Tropical commodities emphasized. Pre: 200, BIOL 171, or BOT 201; CHEM 152; or consent.

HORT 481 Weed Science (3) (2 Lec, 1 3-hr Lab) Weed classification, identification, adaptations for weediness; principles of weed control; properties, uses, and action of herbicides. Lab: pesticide application equipment and techniques, no-till farming, greenhouse and field experiments. Pre: 200 and CHEM 152.

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

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

HORT 499 Directed Study (V) Supervised individual instruction in field laboratory and library. Repeatable. CR/NC only. Maximum of 3 credit hours. Pre: 364.

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

HORT 601 Crop Modeling (3) (2 Lec, 1 3-hr Lab) Principles of modeling crop growth and development, model types, techniques, simulation. Modeling influence of climate/environment on phenology, growth, development of horticultural crops. Pre: AREC 310 and BOT 470. Recommended: AREC 210 or MATH 205.

HORT 603 Experimental Design (4) (3 Lec, 1 3-hr Lab) Design of experiments and variance analyses in biological and agricultural research. Pre: AREC 310 or ZOOL 651. Recommended: ZOOL 632. (Cross-listed as AGRN 603 and ANSC 603)

HORT 614 Cellular Genetics of Crops (3) (2 Lec, 1 3-hr Lab) Applications of molecular genetics and cytogenetics to crop improvement. Pre: 453 and ENBI 402.

HORT 615 Quantitative Genetics (3) Applications of quantitative genetics to crop and animal improvement. Pre: 603 or consent.

HORT 654 Communications in Agriculture (1) (3-hr Lec/ Lab combination) Laboratory-type course for improving communication abilities. Presentations to lay audiences are emphasized. Hands-on experience in techniques and methods is provided.

HORT 664 Plant Growth and Development (3) Physiology of plant growth regulators, tropisms, circadian rhythms, translocation, photoperiodism and vernalization, germination, dormancy and senescence. Pre: BOT 470 and ENBI 402. (Cross-listed as BOT 674)

HORT 699 Directed Research (V) In-depth study of specialized problems. CR/NC only. Maximum of 8 credit hours. Pre: consent.

HORT 700 Thesis Research (V) HORT 710 Mineral Nutrition of Tropical Crops (3) (1 2-hr Lec, 1 3-hr Lab) Mineral nutrition of plants in relation to plant metabolism, mechanisms of ion uptake, long-distance transport of solutes, and interactions at the root-soil interface. Special emphasis on problems associated with tropical crops. Pre: BOT 470 and SOIL 450; or consent. (Cross-listed as AGRN 710) (Alt. years)

HORT 711 Special Topics in Experimental Horticulture (V) Specialized topics from various areas in horticultural research such as experimental techniques, growth regulation, morphogenesis, genetics and breeding, culture and nutrition of tropical crops. Pre: consent.

HORT 800 Dissertation Research (V) HRM 399 Directed Reading and Research (V) Reading and research in a special area within the major field 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.


HRM 455 The Staffing Process (3) Contemporary practices and trends in personnel planning for a competent work force; legal constraints, recruitment and selection, differential placement, training, career programming. Pre: 351.

HRM 663 Personnel Administration (3) Analysis and critical evaluation of basic issues, policies, and trends in personnel administration.

ILOKANO (ILO) College of Languages, Linguistics and Literature ILO 101 Elementary Ilokano (4) Listening, speaking, reading, writing. Structural points introduced inductively. Meets five hours weekly; daily lab work. FL

ILO 102 Elementary Ilokano (4) Continuation of 101. FL


ILO 112 Intensive Elementary Ilokano (10) ILO 201 Intermediate Ilokano (4) Continuation of 102. Meets five hours weekly; daily lab work. Pre: 102 or equivalent. FL

ILO 202 Intermediate Ilokano (4) Continuation of 201. FL


ILO 302 Third-Level Ilokano (3) Continuation of 301.


ILO 402 Fourth-Level Ilokano (3) Continuation of 401.

ILO 424 Introduction to Ilokano for Interpreters (3) Techniques for interpreting Ilokano into English and vice versa. A-F only. Pre: 302 or consent.

For key to symbols and abbreviations, see the first page of this section.
Indo-Pacific Languages (IP)

College of Languages, Linguistics and Literature

In addition to the languages normally offered by the department, other languages commanded by individual faculty members may be offered if demands and staff permit, e.g., classical Arabic, Arata, Avestan, Balinese, Javanese, Malay, Old Persian, Sundanese, and Tongan. Interested students should consult the department chair. Language concentrations in certain other degree programs, e.g., through the Liberal Studies Program, may be arranged. Inquire at the department office.

IP 101 Directed Elementary Language Study (4) Directed study of a South Asian, Southeast Asian, or Pacific language not regularly listed by the department. Prerequisite: consent.

IP 102 Directed Elementary Language Study (4) Continuation of 101.

IP 199 Introductory Language Study (V) Introduction to a South Asian, Southeast Asian, or Pacific language not regularly offered. Hours and credits determined by student interests and faculty resources. Repeatable up to 8 credit hours. Prerequisite: consent.

IP 200 Directed Intermediate Language Study (4) Continuation of 102. Prerequisite: consent.

IP 201 Directed Intermediate Language Study (4) Continuation of 200. Prerequisite: consent.

IP 202 Directed Intermediate Language Study (4) Continuation of 202. Prerequisite: consent.

IP 261 Topics in Indo-Pacific Language/Culture (V) Study of a literature or culture of the Indo-Pacific area through readings in various fields in English. Repeatable up to 6 credit hours. Prerequisite: consent.

IP 273 (Alpha) Introduction to Indo-Pacific Language and Culture (3) Introduction to English to language(s) and culture(s) of Indo-Pacific country or region. (B) Indian; (C) Southeast Asian; (D) Polynesian AH3; (E) Philippine AH3. Prerequisite: 101 and 102 courses in relevant language.

IP 299 Intermediate Language Study (V) Intermediate study of a South Asian, Southeast Asian, or Pacific language not regularly offered. Contact hours and credits determined by student interests and faculty resources. Repeatable up to 8 credit hours. Prerequisite: at least 6 credits of intermediate study in the same language.

IP 301 Directed Third-Level Language Study (3) Continuation of 202. Prerequisite: consent.

IP 302 Directed Third-Level Language Study (3) Continuation of 301.

IP 361 Southeast Asian Literature in Translation (3) Survey of traditional and modern literatures of Southeast Asia; literature written originally in English.

IP 362 Southeast Asian Literature in Translation (3) Survey of traditional and modern literatures of South Asia; a vernacular literature to be determined by faculty resources and student interest.

IP 363 Philippine Literature in English (3) Critical survey of 20th-century Philippine literature written in English; cultural values. Prerequisite: one of ENG 250-257 or consent.

IP 365 South Asian Literature in Translation (3) Survey of traditional and modern literatures of South Asia; literature written originally in English.

IP 366 South Asian Literature in Translation (3) Survey of traditional and modern literatures of South Asia; a vernacular literature to be determined by faculty resources and student interest.

IP 367 Modern Philippine Drama and Film (3) Philippine culture as represented in modern drama and film; zarzuela, psychological drama, theater of protest, Philippine drama in Hawaii. Prerequisite: one of ENG 250-257.

IP 369B Study Abroad: Western Samoa (3)

IP 369E Study Abroad: Vietnam (3)

IP 395 Polynesian Folklore in Translation (3) Traditional Polynesian genres (legends, myths, folktales, fables, proverbs, songs, riddles, jokes) examined in translation and culturally and structurally interpreted. Prerequisite: one of ENG 250-257 or consent. AH3

IP 399 Third-Level Language Study (V) Third-level study of a South Asian, Southeast Asian, or Pacific language not regularly offered. Contact hours and credits determined by student interests and faculty resources. Repeatable up to 6 credits. Prerequisite: at least 6 credits of intermediate study of the same language.

IP 401 Directed Fourth-Level Language Study (3) Continuation of 302. Prerequisite: consent.

IP 402 Directed Fourth-Level Language Study (3) Continuation of 401.

IP 411 Ilokano Literature in Translation (3) Overview of Ilokano literature from the early writings to the major works of contemporary writers. A-F only. Prerequisite: ILO 101, one of ENG 250-257, ENG 363, or ENG 396; or consent.

IP 427 (Alpha) Topics in Samoan Literature (3) (B) Writings of Albert Wendt. Prerequisite: SAM 227 or one of ENG 250-257; or consent. (C) Samoan Women Writers. Prerequisite: SAM 227 or one of ENG 250-257 or WS 254; or consent.

IP 431 Rizal's Literary Works in Translation (3) Interpretation and analyses of Rizal's novels Noli and Fili as they relate to the social, political, and historical context of the Spanish regime in the Philippines. Prerequisite: three credits of English; or consent.

IP 440 Tagalog Folklore (3) Theory and method of comparative and analytical folklore study, with special applications to Pacific traditions. Prerequisite: ANTH 200. (Cross-listed as ANTH 470)

IP 499 Directed Studies (V) Study of a Pacific, South Asian, or Southeast Asian language through vernacular readings in various academic fields. Repeatable. Prerequisite: third-level language and consent.

IP 699 Directed Research (V) Repeatable. Prerequisite: consent.

For key to symbols and abbreviations, see the first page of this section.

Industrial Relations (IR)

College of Business Administration

IR 361 Labor Problems (3) Problems and economics of labor; history, structure, government, activities of trade unions.

IR 463 Collective Bargaining/Dispute Settlement (3) Principles and concepts of collective bargaining; methods of settling disputes over rights and interests. Prerequisite: 361.

IR 465 Labor and Social Legislation (3) Evolution, interpretation, and application of labor and social welfare legislation with special emphasis on impact of labor-management relations. Prerequisite: 361.

IR 467 Labor-Management Relations/Public Sector (3) Review and analysis of basic factors that distinguish private from public employment relations; examination of the development of recent legislation and programs at the federal, state, and municipal level.
levels. Specific consideration given to current problems on the Mainland and Hawai‘i. Pre: 361 or consent.

IR 469 Labor Problems in Asia (3) Survey and comparison of labor markets, economic development, and the role of trade unions in developing countries with particular reference to Asia and the Pacific. Pre: 361.

IR 465 Labor Relations (3) Critical evaluation of theories and models of trade unionism and labor relations; evolution and contributions to social sciences.

IR 666 International Collective Bargaining (3)

IR 667 International Collective Bargaining (3) Expanded and comparative analysis of wage determination systems through collective bargaining in selected developed and underdeveloped countries—the impact of industrialization and international trade on wage-setting.

Information and Computer Sciences (ICS)
College of Natural Sciences

ICS 101 Tools for the Information Age (3) Fundamental concepts and terms of computer technology, application software for problem solving, computer technology trends and impact on individuals and society. Co-requisite: 101L.


ICS 111 Introduction to Computer Science I (3) Overview of computer science, writing programs. Pre: 101 or consent. Co-requisite: 111L NS3.

ICS 111L Introduction to Computer Science I Lab (1) Programming exercise, demonstration and discussion of computer equipment, techniques, issues. Co-requisite: 111.

ICS 141 Discrete Mathematics for Computer Science I (3) Logic, sets, functions, matrices, algorithmic concepts, mathematical reasoning, counting techniques, probability theory, relations, equivalences, partial orderings, graphs. Pre: 111 (or concurrent) or consent.

ICS 211 Introduction to Computer Sciences II (3) Algorithms and their complexity, introduction to software engineering, data structures, searching and sorting algorithms, numerical errors. Pre: 111 and 141 (or concurrent), or consent.

ICS 212 Program Structure (3) Program organization paradigms, programming environments, implementation of a module from specifications, the C and C++ programming languages. Pre: 211 or consent.

ICS 311 Algorithms and Data Structures (3) Data structures, including arrays, records, pointers, trees, and graphs, storage management, algorithms for searching and sorting, mathematical analysis of algorithms. Pre: 141 and 211, or consent.

ICS 312 Machine-Level and Systems Programming (3) Machine organization, machine instructions, addressing modes, assembler language, subroutine linkage, linking to higher-level languages, interface to operating systems, introduction to assemblers, loaders and compilers. Pre: 211 and 212 (or concurrent), or consent.

ICS 313 Programming Language Theory (3) Syntax, control structures, data binding and scope, language styles, programming in LISP and Prolog, language and automata theory. Pre: 141 and 212, or concurrent.

ICS 321 Data Storage and Retrieval (3) Data storage devices, timing and capacity, programming for files, hashed and indexed files, introduction to relational database systems. Pre: 141 and 211, or consent.

ICS 331 Logic Design and Microprocessors (3) Basic machine architecture, microprocessors, bus organization, circuit elements, logic circuit analysis and design, microcomputer system design. Pre: 312 or consent. Co-requisite: 331L.

ICS 331L Logic Design and Microprocessors Lab (1) Use of laboratory tools, measurement and construction techniques, hardware debugging, interfacing techniques, microcomputer circuitry and construction. Co-requisite: 331.

ICS 412 Operating Systems (3) Operating system structure, process creation and management, memory allocation and management, scheduling, protection. Pre: 212 and 312, or consent.

ICS 413 Software Engineering I (3) System specification, modeling and analysis, prototyping, hierarchal design, program design methods, cost estimation, project management, computer-aided software design. Team-oriented software-design project. Pre: 311 or consent.

ICS 414 Software Engineering II (3) Continuation of 413. Project management, quality, and productivity control, testing and validation, team management. Team-oriented software-implementation project. Pre: 413.

ICS 415 Introduction to Programming for the Web (3) Introduction to emerging technologies for construction of World Wide Web (WWW)-based software. This course covers the programming and scripting languages used for the creation of dynamic WWW sites and client-server programming. Students will be expected to complete a medium-sized software project that uses all the languages and concepts discussed in the class. Pre: 511 or consent.

ICS 421 Database Systems (3) Principles of database systems, data modeling, relational models, database design, query languages, query optimization, concurrency control data security. Pre: 311 and 321, or consent.

ICS 422 Data Processing (3) Role of data processing in organizations, programming practices, ethics, COBOL language, sequential and indexed file processing, report writing, online transaction processing. Pre: 321 or consent.

ICS 424 Application Frameworks (3) Experience producing applications with at least two different applications frameworks. A-F only. Pre: 212, 311, and 313; or consent.


ICS 440 Discrete Mathematics for Computer Science II (3) Number theory, recursive algorithms, program correctness, planer graphs and graph coloring, trees and their applications, introduction to formal languages and automata. Pre: 141 or consent.

ICS 441 Theory of Computation (3) Grammars, sequential machines, equivalence, minimization, analysis and synthesis, regular expressions, computability, unsolvability, Gödel’s theorem, Turing machines. Pre: 313.

ICS 442 Analytical Models and Methods (3) Applications of mathematical methods in computer science with emphasis on discrete mathematics, numerical computation, algebraic models, operations research. Pre: 311 and MATH 206.

ICS 451 Data Networks (3) Network analysis, architecture, digital signal analysis and design; circuit switching, packet switching, packet broadcasting; protocols and standards, local area networks, satellite networks, ALOHA channels; examples. Pre: 141 and 212, or consent.

ICS 461 Artificial Intelligence I (3) Survey of artificial intelligence: natural language processing, vision and robotics, expert systems. Emphasis on fundamental concepts: search, planning, and problem solving, logic, knowledge representation, Pre: 111.

ICS 464 Introduction to Cognitive Science (3) Introduces basic concepts, central problems, and methods from cognitive science. Identifies contributions from disciplines such as cognitive psychology, linguistics, artificial intelligence, philosophy, and neuroscience. Pre: 111 or consent.

ICS 466 Introduction to Hypermedia (3) Basic issues of interactive access to information in various formats on computers. Available hardware and software: editing, integration, programming, implementation of a sample information system. Pre: 311.

ICS 471 Probability, Statistics, and Queuing (3) Introduction to: probability, Markov chains, queuing theory, statistical inference, and regression. Emphasizes on computer system applications and statistical computing and simulation. Pre: 141 or consent.

ICS 481 Introduction to Computer Graphics (3) Fundamentals of computer graphics including graphics hardware, representation, manipulation, and display of two- and three-dimensional objects, use of commercial software: Pre: 311 and MATH 206, or consent.

ICS 491 Special Topics (3) Reflects special interests of faculty. Oriented toward juniors and seniors. Pre: consent.

ICS 499 Computer Project (V) Individual or small-group projects in system design or application under faculty supervision. Pre: 315 or 321, or consent.

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

ICS 611 Compiler Theory and Construction (3) Design and implementation of compilers, syntactic and semantic descriptions

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For key to symbols and abbreviations, see the first page of this section.
of programming languages, algorithms for syntactic analysis and object code generation. Pre: 312 or consent.

**ICS 612 Theory of Operating Systems (3)**
Advanced study in operating systems theory and design with emphasis on case studies and distributed systems. Pre: 412.

**ICS 613 Advanced Software Engineering (3)**
Fundamental software engineering procedures, including planning, estimation, design, testing, process definition and improvement, and software quality assurance. Measurement techniques are used to support empirically-driven software process improvement throughout the course. Pre: 414 or consent.

**ICS 621 Analysis of Algorithms (3)**
Analysis and design of algorithms: modeling, comparison, measures, applications. Pre: 311.

**ICS 622 Systems Modeling and Evaluation (3)**
Mathematical modeling, analysis, optimization, and simulation techniques, applications to design and evaluation of computer software systems. Pre: 412, 440, and 471; or consent.

**ICS 623 Data Security (3)**
Classical ciphers, current encryption standards, public key cryptography, authentication, digital signatures, security in operating systems and databases. Pre: 321 and 412, or consent.

**ICS 641 Theory of Computation (3)**
Advanced topics in formal languages, automata, computability, computational complexity. Pre: 440 or consent.

**ICS 651 Computer Networks (3)**
Elementary principles of modern computer networking. Detailed coverage of overall architecture and the physical, data link, and network layers, with emphasis on the network layer. Pre: 451.

**ICS 661 Artificial Intelligence II (3)**
Current issues in artificial intelligence, including expert systems, knowledge representation, logic programming, learning, natural language processing. Pre: 461.

**ICS 662 Computer Algebra (3)**
Use of computers and non-numeric mathematics, including algebra and calculus, theory and applications. Pre: 440 or consent.

**ICS 663 Pattern Recognition (3)**
Nature of the problem in pattern recognition and clustering; explanation of various algorithms. Pre: MATH 371.

**ICS 664 Human-Computer Interaction (3)**

**ICS 665 User Interfaces and Hypermedia (3)**

**ICS 671 Applied Regression Analysis (3)**
Fitting a straight line by least squares, multiple regression, hypothesis testing, examination of residuals, dummy variables, stepwise regression, analysis of variance, nonlinear estimation, computer assignments. Pre: 471.

**ICS 672 Time Series Analysis (3)**
Least squares and maximum likelihood theory, application to stationary and nonstationary parametric time series model fitting. Pre: 671.

**ICS 673 Multivariate Analysis (3)**

**ICS 681 Computer Graphics (3)**
Selected advanced topics in computer graphics. Substantial project required. Pre: 481 or consent.

**ICS 682 Numerical Computation (3)**
Selected topics in numerical analysis, mathematical software, and scientific computation; examples include sparse matrix methods, finite element methods, mathematical programming. Repeatable. Pre: 440 or consent.

**ICS 690 Seminar in ICS (1)**
Series of talks on advanced research topics. CR/NC only.

**ICS 691 Topics in Software (3)**
Reflects special interests of faculty in advanced programming, systems programming, software systems. Repeatable. Pre: consent.

**ICS 692 Topics in Theoretical Computer Science (3)**
Reflects special interests of faculty in theoretical computer science. Repeatable. Pre: consent.

**ICS 699 Directed Reading/Research (V)**
Graduate standing and consent.

**ICS 700 Thesis Research (V)**
Research for master’s thesis.

**ICS 800 Dissertation Research (V)**

**Insurance (INS)**

**INS 300 Principles of Insurance (3)**
Analysis and treatment of pure risks; utilization of insurance programs to provide protection against financial losses caused by property losses; third-party claims and premature death.

**INS 311 Property and Casualty Insurance (3)**
Treatment of risk of financial loss of personal and business property and resulting loss of income occasioned by fire and allied perils. Forms of insurance used by individual business executives and firms including crime, transportation, liability, and worker compensation. Pre: 300.

**INS 331 Life Insurance (3)**
Treatment of the risk of premature death through use of various life insurance policies. Policy forms, calculation of premiums, reserves, non-forfeiture values, underwriting, regulation of policy provisions, related coverage. Pre: 300.

**Interdisciplinary Studies (IS)**

**IS 101A Ways of Knowing (3)**
Examines scholarly discourse in the information and technology age. Introduces the nature of investigation and presentation in an academic environment. Practice in research and information technologies to think critically and analytically about education and community issues. AF only.

**IS 291 Community Service Practicum (V)**
Supervised fieldwork in community agency, arranged by student. Repeatable once. Pre: written proposal approved by Honors director and appropriate faculty adviser.

**IS 300 Field Study (V)**
Pre-arranged systematic field investigation of selected topics. Pre: written proposal approved by Honors director and appropriate faculty adviser.

**IS 311 Independent Study Tutorial (V)**
Comprises a full-semester load. Not open to freshmen or students on probation. Pre: acceptable proposal and consent of Honors director and appropriate faculty adviser.

**IS 312 Independent Study Tutorial (V)**
Continuation of 311.

**IS 369 British Life and Culture (3)**

**IS 386 Perspectives on Nuclear War (3)**
Survey, from the perspectives of several disciplines, of the nature and effects of nuclear weapons; policies governing them; possible alternatives. Pre: one core course in social or natural sciences.

**IS 489 Environmental Practicum (3)**
Field experience in study and abatement of environmental problems under faculty direction. Project proposal, narrative activity log, and documentary report are required. Pre: upper division standing, courses in appropriate discipline, and consent.

**IS 600 Business/Public Organizations (3)**
Critical review of literature in theory and practice. For students in business, educational and public health administration, political science, social work, etc. (Cross-listed as EDEA 600)

**IS 610 Field Study in Gerontology (V)**
Individually designed field experience for advanced certificate in gerontology students. Placements arranged at community programs, research sites, and special projects at the Center on Aging. Repeatable.

**IS 611 Interdisciplinary Seminar in Gerontology (3)**
Understanding of gerontology as an interdisciplinary field of study and application of such understanding to both theoretical and applied aspects of aging. Repeatable.

**Interpretation and Translation (IT)**

**College of Languages, Linguistics and Literature**

**IT 401 Principles of Translation (3)**
This course aims to make the student aware of the translation process and the criteria for evaluating translations. It includes readings and discussions of the translation process, terminology research as well as intensive practice in precise writing, paraphrasing, and summarizing. Pre: at least 300-level proficiency in a second language.

**IT 402 Professional Orientation (1)**
Survey course. Translation as a profession. Professional history. Professional organizat-
COURSES: INTERPRETATION AND TRANSLATION–ITALIAN 329

Italian (ITAL)

College of Languages, Linguistics and Literature

Students choosing Italian for the language requirement should realize it may not be offered if demand is limited.

ITAL 101 Elementary Italian (4) Conversazione, laboratory drill, grammar, and reading. FL
ITAL 102 Elementary Italian (4) Continuation of 101. FL
ITAL 201 Intermediate Italian (3) Reading, conversation, laboratory drill, composition. Pr. 102. FL
ITAL 202 Intermediate Italian (3) Continuation of 201. Pr. 201. FL
ITAL 258 Intermediate Italian Abroad (3) Intensive course of full-time formal instruction in Italy on the second-year level in Italian language and culture. Pr. 102 or equivalent, or consent. FL
ITAL 259 Intermediate Italian Abroad (3) Intensive course of full-time formal instruction in Italy on the second-year level in Italian language and culture. Pr. 102 or equivalent, or consent. FL
ITAL 358 Third-Level Italian Abroad (3) Intensive course of full-time formal instruction in Italy on the third-year level in Italian language and culture. Pr. 202 or equivalent, or consent.
ITAL 359 Third-Level Italian Abroad (3) Intensive course of full-time formal instruction in Italy on the third-year level in Italian language and culture. Pr. 202 or equivalent, or consent.
ITAL 458 Fourth-Level Italian Abroad (3) Intensive course of full-time instruction in Italy on the fourth-year level in Italian language, linguistics, culture, and literature. Pr. 359 or equivalent, or consent.
ITAL 459 Fourth-Level Italian Abroad (3) Intensive course of full-time instruction in Italy on the fourth-year level in Italian language, linguistics, culture, and literature. Pr. 359 or equivalent, or consent.

For key to symbols and abbreviations, see the first page of this section.
Japanese (JPN)

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 is required in the prerequisite courses for continuation.

JPN 100 Elementary Japanese, Special (3)
Same material as 101, covered more quickly for students with some language background. Pre: placement test. FL

JPN 101 Elementary Japanese (4) Listening, speaking, reading, writing, grammar. Meets one hour daily, Monday–Friday, plus daily lab work. Pre: placement test. FL

JPN 102 Elementary Japanese (4) Continuation of 100 or 101. Pre: 100, 101, or consent. FL

JPN 105 Accelerated Elementary Japanese (8) Content of 101 and 102 covered in one semester. Meets two hours daily, Monday–Friday, plus daily lab work. Pre: consent. FL

JPN 201 Intermediate Japanese (4) Continuation of 101 and 102. Meets one hour daily, Monday–Friday, plus daily lab work. Pre: 102, 105, or placement test. FL

JPN 202 Intermediate Japanese (4) Continuation of 201. Pre: 201 or placement test. FL

JPN 205 Accelerated Intermediate Japanese (8) Content of 201 and 202 covered in one semester. Meets two hours daily, Monday–Friday, plus daily lab work. Pre: 102, 105, or consent. FL

JPN 211 Second-Year Japanese for Business/TIM (4) Specific aspects of Japanese language and culture intended to meet the social demands and working requirements of business and/or travel industry management. Meets five hours a week plus lab work. Pre: 102, 105, or consent; and business or TIM major. JPN 212 Second-Year Japanese for Business/TIM (4) Continuation of 211. Pre: 201, 211, or consent; and business or TIM major.


JPN 259 Intermediate Japanese Abroad (4) Continuation of 258. Pre: 201 or 258.

JPN 301 Third-Year Japanese (4) Translational course employing four skills (listening, speaking, reading, writing) and grammar training to prepare students to address academic content in Japanese. Meets one hour daily, Monday–Friday, plus daily lab work. Pre: 202, 205, or placement test.

JPN 302 Third-Year Japanese (4) Continuation of 301. Pre: 301 or placement test.

JPN 305 Accelerated Third-Year Japanese (8) Content of 301 and 302 covered in one semester. Meets two hours daily, Monday–Friday, plus daily lab work. Pre: 202 or 205; or consent.

JPN 307 Special Japanese Reading and Writing (3) For bilingual students whose aural and spoken skills in Japanese were acquired informally. Emphasis on reading and writing through level. Pre: placement test. FL

JPN 308 Special Japanese Reading and Writing (3) Continuation of 307. Pre: 307 or placement test. FL

JPN 315 Third-Year Japanese Aural Comprehension (3) Training in strategies for listening to various types of spoken material presented in narrations, interviews, news broadcasts, and lectures, etc. Pre: 302 or consent.

JPN 350 Introduction to Japanese Linguistics (3) Introduction to major areas of linguistic description as applied to Japanese language. Pre: 302 or 305.


JPN 359 Third-Level Japanese Abroad (4) Continuation of 358. Pre: 301 or 358.


JPN 399 Directed Third-Level Reading (V) For those who need special assistance, e.g., reading texts in area of specialization or at a pace more rapid than those of standard courses. Repeatable. Pre: consent.

JPN 401 Fourth-Level Japanese Reading (3) Continuation of 301 and 302 with emphasis on development of reading skills. Pre: 302, 305, or placement test.

JPN 402 Fourth-Level Japanese Reading (3) Continuation of 401. Pre: 401 or placement test. FL


JPN 407 (Alpha) Readings in Original Texts (3) (B) newspapers and magazines; (C) social sciences; (D) humanities; (E) modern literature. Pre: 402, 405, or consent.

JPN 415 Japanese Aural Comprehension (3) Training in comprehension of spoken material presented in news broadcasts, documentary narration, formal lectures, etc. Pre: 402, 405, or consent. May be concurrent with 407.

JPN 420 Fourth-Level Spoken Japanese (4) Training in oral communication skills in varied social contexts. Pre: 402 or 405.

JPN 421 Japanese Composition (3) Writing skills refined through practice in various styles (essays, letters, etc.). Pre: 402, 405, or consent.


JPN 451 Structure of Japanese (3) Introduction to morphology, syntax, and semantics of modern colloquial Japanese. Pre: 402 or 405, and 350 or LING 320; or consent.


JPN 461 Introduction to Classical Japanese (3) Basic classical Japanese grammar to develop reading skills. Pre: 407 or consent.

JPN 466 Readings in Classical Japanese (3) Introduction to major genres of prose and poetry. Repeatable once with permission. Pre: 461 or consent.

JPN 485 (Alpha) Advanced Reading in Modern Japanese (3) (B) literature; (C) nonfiction. Repeatable once. Pre: 407E and one of 407B, 407C, or 407D; or consent.


JPN 495 Internship Program (3) Analysis of intercultural communication processes under faculty supervision through participation in an organization serving native speakers of Japanese. Pre: 302 and 570 (or concurrent), or consent.

JPN 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. Primarily for graduate students from other departments. Repeatable. Pre: consent.

JPN 601 Japanese Phonology and Morphology (3) Introduction to the phonology and morphology of modern colloquial Japanese. Pre: LING 320 or consent.

JPN 602 Japanese Syntax and Semantics (3) Introduction to theories of syntax, sentence structure, parts of speech, constituency, grammatical relations and case marking, word order, passives, causatives, tense, aspect, and embeddings. Pre: LING 320 or consent.

JPN 604 Introduction to Japanese Language Pedagogy (3) Training in the identification and analysis of general problems in Japanese language learning, teaching, and testing by examining theoretical issues and conducting classroom research. Pre: 407 or equivalent, 451 and 605 (or concurrent).

JPN 605 Research Methodology in Japanese Linguistics and Language Teaching (3) Japanese-specific training in the formulation of testable hypotheses, in basic statistical and other evaluation techniques, and in the organization and presentation of ideas and data in paper, abstracts, etc. Pre: 407 or equivalent.

JPN 606 Introduction to Japanese Sociolinguistics (3) Introduces theories of language use and provides training in the methodology and analysis of Japanese sociolinguistics. Pre: 370, 407 or equivalent, and 605 (or concurrent).

JPN 610 (Alpha) Japanese Poetry (3) Historical survey of major poetic types. Repeatable once with consent. (B) classical; (C) medieval Edo; (D) modern. Pre: 466 or consent for (B) and (C); 485 or consent for (D).

JPN 611 (Alpha) Modern Japanese Literature (3) Representative literary works, emphasis on fiction. Repeatable once with...
COURSES: JAPANESE–JOURNALISM

JPN 612 Edo Literature (3) Critical reading and analysis; emphasis on prose. Repeatable once with consent. Pre: 466 or consent.

JPN 613 Medieval Japanese Literature (3) Critical reading and analysis of Kamakura and Muromachi literature; emphasis on prose. Repeatable once with consent. Pre: 466 or consent.

JPN 614 Classical Japanese Literature (3) Critical reading and analysis of Heian literature; emphasis on prose. Repeatable once with consent. Pre: 466 or consent.

JPN 615 History of the Japanese Language (3) Survey, theories of origin; related topics in linguistic methodology. Pre: 461 and 601, or consent.

JPN 632 Teaching Japanese as a Second Language (3) Practical overview of major problems; motivation; adult second language learning; communicative and linguistic competence; practical classroom techniques of teaching and testing. Pre: 604 or consent.

JPN 633 Japanese Sociolinguistics (3) Variations in language form and use depending on social factors. Pre: 601 or 602 (or concurrent), and 606; or consent.

JPN 634 Advanced Japanese Syntax and Semantics (3) Theoretical problems in description of Japanese; contributions of Japanese linguistic study to syntactic theory. Pre: 602 or consent.

JPN 640 Themes in Japanese Literature (3) Intensive study of selected themes in Japanese literature, primarily in the modern period. Content to be announced. Open to non-majors. Repeatable with consent. Pre: 465 or equivalent, or consent.

JPN 641 Traditional Literary Theory (3) Reading and analysis of major works of literary theory and criticism from the classical, medieval, and Edo periods. Pre: 466 or consent.

JPN 642 Kambun (3) Introduction to kambun [the Japanese manner of reading and writing classical Chinese], with critical reading of kambun by Japanese authors. Pre: 601 or consent.

JPN 650 (Alpha) Topics in Japanese Linguistics (3) (C) Japanese/English contrastive analysis (Pre: 601 and 602); (G) structure; Pre: 634 (H) historical change; Pre: 631 (K) history of Japanese language studies (Kobugaku-shi); Pre: 631 (M) morphophonemics; Pre: 601 (P) pedagogy; Pre: 632 (S) sociolinguistics; Pre: 633.

JPN 699 Directed Research/Reading (V) CR/NC only. Pre: consent of chair.

JPN 710 (Alpha) Research Seminar in Japanese Literature (3) (M) modern; Pre: 611 (P) pre-modern; Pre: 612, 613, or 614.

JPN 730 (Alpha) Research Seminar in Japanese Linguistics (3) (C) Japanese/English contrastive analysis; Pre: 451, or 601 and 602 (G) structure; Pre: 654 (H) historical change; Pre: 651 (K) history of Japanese language studies (Kobugaku-shi); Pre: 631 (M) morphophonemics; Pre: 601 (P) pedagogy; Pre: 632 (S) sociolinguistics; Pre: 633.

JPN 799 Practicum: Teaching Japanese Language (V) This course is designed for graduate students pursuing Japanese language teaching and learning, while developing teaching skill, curriculum competence, and leadership. Pre: 652 and EALL 601, or consent.

Journalism (JOUR)

JOUR 150 The Press and Society (3) Communications media in theory and practice. Development, role, influence; rights, responsibilities, problems, issues, and trends. SS

JOUR 205 News Writing (3) Fundamentals of news style, reporting, ethics. Pre: minimum grade of B in 150 or ENG 100 (no ESL 100); or consent.

JOUR 206 News Editing (3) Training in editing news material for accuracy, clarity, and relevance. Headline writing. A–F grading only. Pre: 205 or consent.

JOUR 307 Photojournalism (3) Production, selection, and use of photographs for publications. Storytelling with black and white action and feature photos. Students must have a 35mm single lens reflex camera and supply own black and white film and photographic paper. Pre: 205.

JOUR 315 Public Affairs Reporting (3) Writing about governmental affairs, contemporary issues by using techniques of interviewing and of analyzing library materials plus court, legislative, real property, and other public records. A–F grading only. Pre: 206 (or concurrent) or consent.

JOUR 316 Advanced Editing (3) Intensive training in editing, planning, and organizing stories and visual elements for publication; news judgment; managing projects. Pre: 206 or consent.

JOUR 320 Public Relations (3) Current practice and problems in systematic use of media and techniques to influence the public. Pre: 205 or consent.

JOUR 325 Magazine Writing (3) Writing nonfiction articles for magazines, newspapers, and newsletters; preparing material for specific audience; marketing articles. Pre: 206 (or concurrent).

JOUR 327 Interpretive Journalism (3) Writing articles of news analysis, editorials, and critical reviews. Pre: 206 (or concurrent) or consent.

JOUR 360 Journalism History and Trends (3) Development of the news media and trends that may affect the future of journalism. Pre: upper division standing.

JOUR 365 Media and the Law (3) Function of American legal system as it relates to news media. Libel, copyright, freedom of information, free press vs. fair trial, regulation of broadcasting. A–F grading only. Pre: upper division standing or consent.

JOUR 366 Broadcast News Writing and Editing (3) Writing and editing of news for radio and television. Lectures and assignments to develop the special skills required. Pre: 205 or consent.

JOUR 385 Practicum (1) Working on campus student or quasi-professional publications under professional and faculty supervision. CR/NC only. Repeatable. Pre: 205 or consent.

JOUR 407 Advanced Photojournalism (3) Computer experience in the creation, manipulation, and editing of color news, feature, sports, and documentary images. Study of the ethical and legal dimensions of electronic imaging. Pre: 307 or consent.

JOUR 410 Writing for Public Relations (3) Techniques of researching, planning, and writing public relations messages for a variety of audiences and media. Pre: 206 and 320, or consent.

JOUR 412 Contemporary Public Relations (3) Advanced research, planning, and writing techniques for production and dissemination of persuasive messages, research reports, and campaign proposals, as applied to specialized contemporary public relations practice. Pre: 410 or consent.

JOUR 415 Advanced Reporting (3) Intensive training in reporting and writing in sensitive news areas for advanced students. Fieldwork. A–F grading only. Pre: 315 or consent.

JOUR 420 Advanced Public Relations (3) Application of traditional and innovative techniques to establish relationships, develop understanding and goodwill, and solve complex contemporary public relations problems. A–F grading only. Pre: 206 and 320, or consent.

JOUR 425 Publication Layout and Design (3) Visual display concepts and procedures for newsletters, brochures, newspapers, magazines. Pre: 206 and upper division standing.

JOUR 436 Broadcast News Reporting (3) Reporting, writing, scripting, on-air delivery, producing for broadcast news. Laboratory and fieldwork. A–F grading only. Pre: 315 (or concurrent) and 566; or consent.

JOUR 445 Specialized Reporting (3) Coverage of a selected field or beat, developing background materials, news sources, and story ideas. A–F grading only. Pre: 315.

JOUR 460 Journalistic Ethics (3) Ethics and responsibility in journalism. Case studies. Research paper required. Pre: 315 and senior standing, or consent; 365 and PHIL 101 recommended.

JOUR 466 Advanced Broadcast News (3) Preparation of TV news public affairs programs and mini-documentaries; delivery on air; use of videotape recorders in reporting. Pre: 315 (or concurrent) and 566; or consent.


JOUR 485 Fieldwork (3) Internship in media or PR operations under professional and faculty supervision. CR/NC only. Pre: one of 315, 520, 366, or 425; and consent.

JOUR 499 Directed Research (V) Individual research projects. Pre: senior standing and consent of department chair.

JOUR 515 Advising School Publications (2)
**Kinesiology and Leisure Science (KLS)**

**College of Education**

_Students registering for 101–186, 323, 331–338, 371–374, and 487 will be requested to complete a medical history form and liability disclaimer form on the first day of instruction. All students taking 393, 394, 493, and 494 must be immunized for hepatitis B virus prior to admission in the class._

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

**KLS 102 Aerobic Fitness: Beginning (1)** Aerobic fitness improvement upon completion of course. Learning and practicing safe total body workout routines done to music. Developing an individual fitness program and recording progress in that program.

**KLS 103 Swimming: Beginning (1)** Adjusting to and immersing in water, floating, sculling; correct arm stroke, leg kick, breathing techniques and their coordination. (Student to provide own swimming attire approved by instructor.)

**KLS 104 Swimming: Intermediate (1)** Perfecting and integrating basic strokes with added emphasis for distance and speed. (Student to provide own swimming attire approved by instructor.) Pre: 103 or consent.

**KLS 105 Swimming: Advanced (1)** Correct techniques used in competitive swimming, racing starts, correct turning techniques, long-distance swimming. (Student to provide own swimming attire approved by instructor.) Pre: 104 or consent.

**KLS 106 SCUBA Diving: Beginning (1)** Learning watermanship, equipment handling skills, and the knowledge to become safe divers. Additional costs for equipment, diver manual, dive tables, and certification fee.

**KLS 110 Golf: Beginning (1)** Rules, etiquette, grip, stance, drive, normal iron shots, approach shots, putting.

**KLS 111 Golf: Intermediate (1)** Corrective work on basic swing mechanics and rhythm; adjustments for bunker play, uphill lies, downhill lies, short game around and on the green; handcapping and match play competition. Pre: 110 and consent.

**KLS 112 Golf: Advanced (1)** Improving drive, fairway wood shots, long iron shots, control shots, trouble shots, putting; course management, competitive strategy, problems in rules. Greens fees paid by students for play on courses. Pre: 111 and consent.

**KLS 115 Bowling (1)** Rules, etiquette, arm swing, approach, execution, scoring, spare pickups. Students pay charge for use of alley.

**KLS 118 Rifle Marksmanship (1)**

**KLS 120 Badminton (1)** Rules, etiquette, grip, forearm and backhand strokes, serving, smash, drive, net play, offensive and defensive strategy; singles and doubles play.

**KLS 123 Folk and National Dances (1)** Popular dances of various national groups, including square dances.

**KLS 124 Dances of Hawai‘i (1)** Background and fundamentals of hula. Selected dances with and without instruments.

**KLS 125 Dances of Hawai‘i: Advanced (1)** Advanced techniques in hula movements. Selected dances taught will be more complex, including work with instruments. Individual choreography will be emphasized. Pre: 124 or consent.

**KLS 126 Social Dance: Western (1)** Social dances including fox trot, waltz, swing, line dances, and other popular dances. Basic steps, rhythm pattern, styling, and variations are taught. Social etiquette is stressed.

**KLS 127 Social Dance: Latin (1)** Social dances of a Latin flavor including rhumba, cha-cha, tango, samba, and others. Basic steps, rhythm pattern, styling, and variations are taught. Social etiquette is stressed.

**KLS 130 Tennis: Beginning (1)** Rules, etiquette, grip, forearm and backhand strokes, serving, volleying; singles and doubles play.

**KLS 131 Tennis: Intermediate (1)** Corrective work in three basic strokes and in net play; the lob, drop shot, overhead smash, and half-volley; applying spin in basic strokes; basic strategy in singles and doubles play. Pre: 130 or consent.

**KLS 132 Tennis: Advanced (1)** Improving upon the strokes introduced in 130 and 131; advanced competitive strategy; problems in rules; officiating; elements of tournament play. Pre: 131 or consent.

**KLS 135 Volleyball (1)** Rules, serving, passing, setting up, spiking, blocking, offensive and defensive team play strategy.

**KLS 137 Basketball (1)** Rules, passing, shooting, dribbling, rebounding, individual defensive and offensive maneuvers; team offense and defense.

**KLS 151 Adapted and Prescribed Exercises (1)** Small group and individual guidance and instruction for students recommended by student health service. Pre: consent.

**KLS 152 Weight Training (1)** Kinesiology of lifting and weight training, various types of exercises and methods of training with resistance.

**KLS 153 Weight Training: Advanced (1)** Advanced weight training methods and training systems with particular emphasis on applicability to performance in competitive sports. Pre: 152.

**KLS 154 Tumbling and Rebound Tumbling (1)** Single and combination stunts on tumbling mats and trampoline, balancing stunts; techniques of spotting; safety procedures.

**KLS 156 Heavy Apparatus (1)** Single and combination stunts on side horse, horizontal bar, parallel bars, still rings; techniques of spotting; safety procedures.

**KLS 160 Judo (1)** Rules, etiquette, method of falling and breaking the fall, simple throws and their counters, simple holds and breaking of such holds, randori. (Student to provide own gi.)

**KLS 161 Aikido (1)** Rules, etiquette, basic rolls, simple holds and the breaking of such holds, specific physical conditioning exercises. (Student to provide own gi.)

**KLS 163 T’ai Chi Ch’uan (1)** Classic forms of t’ai chi ch’uan.

**KLS 164 Karate: Beginning (1)** Rules, etiquette, basic stances, blocks, thrusts, kicks, ippon kumite, and selected kata. (Student to provide own gi.)

**KLS 165 Karate: Intermediate (1)** Emphasis on improving the basic techniques (stances, punches, kicks, forms, and sparring); introduction to combination techniques. (Student to provide own gi.) Pre: 164.

**KLS 167 Wrestling: Beginning (1)** Rules: fundamental defensive and offensive maneuvers and competitive strategy, i.e., takedowns, reversals, escapes, and pinning combinations; conditioning exercises.

**KLS 170 Yoga: Beginning (1)** Experiencing yoga and its effects on body, mind and consciousness of individual. Course encompasses exercise; breathing techniques, deep relaxation, meditation, practice in concentration, and yogic postures.

**KLS 171 Yoga: Intermediate (1)** Corrective work and improvement of basic techniques. Exercise sets and combinations designed to develop endurance, flexibility, muscle and nerve strength, meditation, and deep relaxation. Pre: 170 or consent.

**KLS 173 Water Polo (1)** Fundamentals of basic water polo skills, namely, ball handling, passing, shooting, dribbling plus a brief introduction into beginning techniques of individual offense and defense. Pre: 104 or consent. (Student to provide own swimming attire approved by instructor.)

**KLS 180 Soccer and Speedball for Physical Educators (1)** Half semester of each sport, covering basic skills, rules, etiquette, offensive and defensive strategies, position play, and playing of game. Primarily for KLS majors; others admitted on space-available basis.

**KLS 181 Sport Proficiency: Net (2)** Knowledge, skill development, positioning and strategy of various net type games (e.g., badminton, pickleball) are introduced within a tactical framework. Primarily for KLS majors; others are admitted on space-available basis. Repeatable once. A-F only.

**KLS 182 Sport Proficiency: Target/Striking (2)** Knowledge, skill development, etiquette and strategy of various target and striking type games (e.g., softball, golf, archery) are introduced within a tactical framework. Primarily for KLS majors; others are admitted on space-available basis. Repeatable once. A-F only.

**KLS 183 Sport Proficiency: Field/Invasion (2)** Knowledge, skill development, positioning, offensive and defensive strategies of various field/invasion type games (e.g., flag football, team handball) are introduced within a tactical framework. Primarily for KLS majors; others are admitted on space-available basis. Repeatable once. A-F only.

**KLS 184 Sport Proficiency: Fitness (2)** Knowledge introducing program implementation, promoting healthy lifestyles, and modeling of appropriate behaviors of fitness activities (e.g., aerobics, personal fitness) across the life-span are introduced. Primarily for KLS majors; others are admitted on space-available basis. Repeatable once. A-F only.

**KLS 185 Floor Exercise Gymnastics (1)** An entry-level course designed to develop students’ knowledge of men’s and women’s

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For key to symbols and abbreviations, see the first page of this section.
gymnastics floor exercise routines, including injury prevention, skill progression, spotting techniques, and routine choreography. Primarily for KLS majors; others admitted on space-available basis.

KLS 186 Track and Field for Physical Education (1) Knowledge, skills, and rules of various track and field events. Organization of track meets and strategy in competition. Primarily for KLS majors; others admitted on space-available basis.

KLS 195 Personal Health and Wellness (2) A wellness approach, including scientifically based information presented to help students take responsibility for their own health and health-related behaviors.

KLS 201 School Health Problems: Elementary (2) Responsibilities of elementary school teacher in recognizing and meeting pupils’ needs, emphasizing teacher’s role in health instruction, health services, school health policies.

KLS 202 School Health Problems: Secondary (2) Responsibilities of secondary school teacher in recognizing and meeting pupils’ needs, emphasizing health instruction, health services, healthful school living, school health policies.

KLS 203 Introduction to KLS (3) Aims and objectives of health, physical education, and recreation; concepts of healthful living, human movement, recreation; examination of areas as academic disciplines and professional services.

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

KLS 205 Introduction to Sports Medicine (3) Overview of the entire area of sports medicine. Students briefly review major musculoskeletal relationships, types of injuries, and concepts of treatment.

KLS 208 Recreation Services in Contemporary Society (3) Theories and philosophies in recreation: history; contemporary issues; roles in modern society; relationship to health, physical education, and exercise science.

KLS 232 Safety and Risk Management (2) Understanding the fundamental principles and techniques of safety and accident-prevention programming emphasizing school, home, public places, on the job, and motor vehicle situations.

KLS 238 Outdoor Recreation Management (3) Objectives and values of outdoor recreation; characteristics and determinants of programs; planning, organization, leadership, and facilities for recreational uses of natural environments. Pre: 208 or consent of instructor.

KLS 241 Health Education Curriculum (2) Objectives of school health program, emphasizing scope and sequence of health instruction; critical examination of health curriculum guides from various states. Pre: 201 or 202.

KLS 249 Programming and Leadership (3) Factors in planning and leading recreation programs; characteristics and responsibilities of leadership in relation to nature, scope, and resources of a variety of programs. Pre: 208 or consent.

KLS 253 Applied Musculoskeletal Anatomy (3) Gross human anatomy, emphasizing identification and description of parts of musculoskeletal system; selected applications to motor activity. Primarily for physical education majors, but open to others with consent. Pre: PHYL 141 and PHYL 141L and PHYL 142 (or concurrent) and PHYL 142L (or concurrent).

KLS 254 Exercise and Sport Physiology (3) Emphasis on physiological responses to exercises and physical training as related to strength, muscular endurance, circulatory–respiratory efficiency. Primarily for physical education majors, but open to others with consent. Pre: 253 (or concurrent) or consent.

KLS 263 Sport Biomechanics (3) Concepts and scientific principles essential to efficient human movement: proper application of kinesiological and mechanical principles to fundamental movements and selected complex motor skills. Pre: 253 and PHYL 100, or consent.

KLS 270 Introduction to Physical Education (2) Methods and materials in teaching physical activities program; techniques in leadership; selection of activities and program evaluation for K–12 licensure. Majors only. Repeatable once. A-F only.

KLS 271 Evaluation in Health Education (2) Processes involved in assessing school health education program with emphasis on measurement criteria and instruments, interpretation of data and content, organization and conduct of evaluation program. Pre: 201 or 202.

KLS 284 Drugs and Society (3) Introduction to psychoactive drugs and their effects; drug regulations; education and rehabilitation programs; psycho-social variables related to the decisions to use/abuse drugs.

KLS 302 School’s Role in Community Health (2) Functional interrelationships between school and other community health organizations in solving school-community health problems. Pre: consent.

KLS 310 Coaching of Football (2) Theory and strategy of offensive and defensive football coaching. Emphasis on coaching philosophy, selecting and developing an offense and defense, organizing practices, special situations, scouting, and training and conditioning. Pre: 204 or consent.

KLS 311 Coaching of Basketball (2) Theory and strategy of offensive and defensive basketball coaching. Emphasis on coaching philosophy, selecting and developing an offense and defense, organizing practices, special situations, scouting, and training and conditioning. Pre: 204 or consent.

KLS 312 Coaching of Baseball (2) Theory and strategy of offensive and defensive baseball coaching. Emphasis on coaching philosophy, selecting and developing an offense and defense, organizing practices, special situations, scouting, and training and conditioning. Pre: 204 or consent.

KLS 315 Coaching of Volleyball (2) Theory and strategy of offensive and defensive volleyball coaching. Emphasis on coaching philosophy, selecting and developing an offense and defense, organizing practices, special situations, scouting, and training and conditioning. Pre: 204 or consent.

KLS 323 Music and Rhythm in Physical Education (2) Use of music in physical education program, emphasizing selection of appropriate music for specific activities as expressive or creative movement, movement exploration, rhythmic gymnastics, dancing. Pre: consent.

KLS 329 Managing Recreation Services (3) Administrative framework and procedures pertinent to the operation of agencies providing recreational services to the various publics. Pre: 208 or consent.

KLS 331 Water Safety Training (3) Theory and methods of advanced lifesaving and water safety leading to American Red Cross Water Safety Instructor (WSI) certification. Pre: 104 or consent. (Student to provide own swim attire approved by the instructor.)

KLS 332 Emergency Care and First Aid Training (2) Practicum in training of persons to become qualified in emergency care knowledge, basic life support, and first aid skills. First Aid and CPR certificates may be earned.

KLS 333 Movement Education (2) Experiential learning of basic motor skills for teachers of elementary school children. Emphasis given to exploratory (indirect) approach.

KLS 334 Upper Elementary Movement Education (2) Development of skills and concepts of games, dance, and gymnastics for grades three–seven. Emphasis given to designing appropriate learning activities. Pre: 333 (or concurrent) or consent.

KLS 335 Coaching of Track and Field (2) Techniques and rules of sprints, distance runs, relays, hurdles, long jump, high jump, pole vault, shot put, discus, and javelin throws; conduct of track and field meets; specific conditioning and training problems. Pre: 204.


KLS 337 Fieldwork in Recreation I (5) Initial supervised leadership experience in recreational agencies. One hour per week in class discussion sessions. For recreation majors only. Pre: consent of recreation adviser.

KLS 338 Fieldwork in Recreation II (5) Second phase of supervised leadership experience in recreational agencies. One hour per week in class discussion sessions. For recreation majors only. Pre: consent of recreation adviser.

KLS 339 Special Recreation (3) Special recreation as a professional field. Overview of special recreation services. Emphasis on recreation services for special populations. Pre: 208 or consent.

KLS 348 Evaluating and Marketing Recreation Services (3) Basic methods in marketing, planning, evaluating programs and problem-solving methods, survey research, research design, data analysis, and report generation for park, recreation, and tourism systems. Pre: 208 and 329 (or concurrent); or consent.

KLS 371 Teaching Techniques—Net (2) Teaching techniques and methods of selected net sport/activities. These include sports/
activities that emphasize the tactical approach in court space. Primarily for KLS majors. Repeatable once. A-F only. Pre: 181, 253, 254, 265 (or concurrent), and 270 (or concurrent); or consent.

KLS 372 Teaching Techniques—Target/Striking (2) Teaching techniques and methods of selected target/striking sports/activities. These include fitness sports/activities that emphasize the tactical approach in sports (e.g., softball, golf, archery). Primarily for KLS majors. Repeatable once. A-F only. Pre: 182, 253, 254, 263 (or concurrent), and 270 (or concurrent); or consent.

KLS 373 Teaching Techniques—Field/Invasion (2) Teaching techniques and methods of selected field/invasion sports/activities. These include sports/activities that emphasize the tactical approach in field space. Primarily for KLS majors. Repeatable once. A-F only. Pre: 183, 253, 254, 263 (or concurrent), and 270 (or concurrent).

KLS 374 Teaching Techniques—Fitness (2) Teaching techniques and methods of selected fitness sports/activities. These include fitness sports/activities that emphasize promoting a healthy lifestyle. Primarily for KLS majors. Repeatable once. A-F only. Pre: 184, 253, 254, 265 (or concurrent), and 270 (or concurrent).

KLS 385 Physical Fitness for Physical Education Teachers (1) Diagnosis and prescription for basic health and fitness problems, scientific principles of training, guidelines for exercise; essentials of scientifically based individualized physical fitness program. Pre: 254.

KLS 390 Student Teaching (10) Full-time supervised experience in secondary school level. Repeatable. CR/NC only. Pre: requirements for registration listed under “student teaching.” Co-requisite: 391.


KLS 393 Practicum in Athletic Training I (4) Introductory-level observations and experiences within the profession of athletic training. Pre: either 205 or BIOM 205, and 352; or consent.

KLS 394 Practicum in Athletic Training II (4) Secondary-level observations and experiences within the profession of athletic training. Pre: 393 or BIOM 393, or consent.

KLS 399 Directed Reading (1–4) Directed reading. Limited to senior majors in health education, physical education, athletic training, or recreation with a minimum GPA of 2.75 in major field.

KLS 401 Current Trends in Health (3) Critical analysis of current problems and trends in basic health education areas that contribute to healthful living in community, home, school. Pre: 201 or 202, or consent. Recommended: 302.

KLS 413 History of Physical Education (3) World history of physical education; lecture-discussion dealing with local, national, and international perspectives of present-day exercise forms, games, sport, and dance. Pre: 203 or consent.

KLS 415 Injury Prevention and Care (4) Advanced knowledge in the concepts, practices, and procedures in the prevention and care of athletic injury and illness. Pre: 253, 254, 263, ANAT 301, and ANAT 302; or consent.

KLS 416 Injury Assessment and Evaluation (4) Advanced knowledge and skills related to the recognition, assessment, evaluation, and appropriate medical referral of athletic injuries and illness. Pre: 415 or consent.

KLS 417 Therapeutic Modalities in Rehabilitation (4) Advanced theoretical and clinical basis for the use of therapeutic exercise in the rehabilitation of athletic injuries and illness. Pre: 415 and 416, or consent.

KLS 418 Therapeutic Exercise in Rehabilitation (4) Advanced theoretical and clinical basis for the use of therapeutic exercise in the rehabilitation of athletic injuries and illness. Pre: 415 and 416, or consent.

KLS 423 Planning and Supervision of Physical Education Programs (2) Effective program development, planning, and supervision, including issues in legal liability and administration of selected aspects of physical education programming in grades K–12.

KLS 428 Current Issues in Leisure Services (3) Philosophical foundations and current and emerging issues in leisure services management and programming. Coverage of leisure research and its implications to practice. Pre: 208, 238, 249, and 329; or consent.

KLS 434 Techniques of Officiating (2) Techniques used by selected sports, emphasizing general concepts of role of official and working knowledge of basic mechanics of officiating. Primarily for physical education and recreation majors.

KLS 437 Camp Resources and Planning (2) (1 Lec, 1-3-hr Lab) Combined lecture and lab course for camp counselors and camp leadership. Plan and evaluate camp experiences for children and youth, including those with disabilities. Includes fieldtrips. Pre: 331 and 332; or consent.

KLS 438 Practicum in Camping (V) Supervised leadership at a camp setting with children and youth, including those with disabilities. Day or residential camps. One full week camping for each credit hour. Maximum of four credit hours. Pre: 437 (or concurrent) or consent.

KLS 443 Physical Education for Students with Disabilities (3) Basics of various disabilities, assessment of physical and motor skill status, individualized activity programs for children and youth with disabilities; relations among school/community/agency providing special programs and services. Pre: 253 and SPED 404, or consent. (Cross-listed as SPED 443)

KLS 470 K-12 Teaching Methods in Physical Education (3) Methods and materials in teaching physical education programs; techniques in leadership; selection of activities and program evaluation for K-12 licensure. Repeatable once. A-F only. Pre: 253, 254, 263, 270, and 371-374; or consent. Major of all aspects of physical education.

KLS 474 Introduction to Tests and Measurement in Physical Education (3) Basic measurement theories, statistical tools and tests used in the measurement and evaluation of physical education knowledge, motor performance, and physical fitness factors.

KLS 476 Motor Learning and Performance (3) Basic consideration is kinesthesia, motor ability, fatigue, developmental factors, practice, motivation in relation to motor learning and human performance. Pre: EDEF 311 or consent.

KLS 477 Motor Development and Learning (3) Motor development through the life span with emphasis on developmental principles, fundamental patterns, and factors affecting motor learning performance. Function of memory, practice, knowledge of performance, and motivation are incorporated.

KLS 480 Nutrition in Exercise and Sport (3)

KLS 481 Introduction to Research in KLS (3) Research methods in the study of physical activity, types of research, statistical concepts and techniques, and reporting research results.

KLS 482 Commercial Recreation (3) Overview of leisure services and trends in commercial, private and employee recreation, and resort and recreational tourism. The social, economic, and environmental significance is examined. Pre: 208, 329, and 428; or consent.

KLS 483 Recreation Planning and Maintenance (3) Examination of social, economic, and environmental factors of recreation and tourism development. Emphasis on methods, processes, citizen participation, design issues/regulations, and land use. Pre: 208, 238, and 329; or consent.

KLS 484 Mood and Behavior Modifiers (3) Identification of substances used by man to modify mood and behavior; sociological problems resulting from their use, misuse, or abuse; analysis of motivations involved in their use, misuse, abuse, or nonuse. Skills in self-awareness, values and alternative training. Implications for health education. Pre: 195 and 202 (or concurrent).

KLS 485 Family Life and Sex Education (3) Physiological, psychological, and sociological aspects of sexuality; analysis of related problems such as venereal diseases, abortion, and contraception. Analysis of sex education in schools. K–12. Implications for health education. Pre: 202, 253, and consent.

KLS 487 Lab: Physical Fitness Assessment (4) Laboratory techniques and procedures for physical fitness assessment. Interpretation of testing results and individual exercise program prescription. Pre: 253, 254, 263, 481, ANAT 301, and ANAT 302; or consent.

KLS 488 Internship: Physical Fitness Assessment (4) Application of various testing procedures on human subjects with different physical capacities. Pre: 487.

KLS 493 Practicum in Athletic Training III (4) Introductory application of practical experiences within the profession of athletic training. Pre: 394 and 415, or consent.

KLS 494 Practicum in Athletic Training IV (4) Advanced application of practical experiences within the profession of athletic training. Pre: 416 and 495, or consent.

KLS 581 (Alpha) Practicum in KLS: Teaching Methods/Techniques (1) For in-service teachers to upgrade subject matter and
develop teaching methods and materials for instruction. Repeatable. Pre: teaching experience or consent.

KLS 582 (Alpha) Practicum in KLS: Teaching Methods/Techniques (2) For in-service teachers to upgrade subject matter and develop teaching methods and materials for physical education administration. Repeatable. Pre: teaching experience or consent.

KLS 583 (Alpha) Practicum in KLS: Administration (1) For in-service teachers/administrators to upgrade subject matter and develop methods and materials for physical education administration. Repeatable. Pre: teaching or administrative experience or consent.

KLS 584 (Alpha) Practicum in KLS: Administration (2) For in-service teachers/administrators to upgrade subject matter and develop methods and materials for physical education administration. Repeatable. Pre: teaching or administrative experience or consent.

KLS 585 (Alpha) Practicum in KLS: Coaching Methods/Techniques (1) For in-service coaches/teachers/administrators to upgrade subject matter and develop methods and materials for athletic coaching. Repeatable. Pre: coaching, teaching, or administrative experience or consent.

KLS 586 (Alpha) Practicum in KLS: Coaching Methods/Techniques (2) For in-service coaches/teachers/administrators to upgrade subject matter and develop methods and materials for athletic coaching. Repeatable. Pre: coaching, teaching, or administrative experience or consent.

KLS 587 (Alpha) Practicum in KLS: Health/Wellness (1) For in-service coaches/teachers/administrators to upgrade subject matter and develop methods and materials in health/wellness. Repeatable. Pre: coaching, teaching, or administrative experience or consent.

KLS 588 (Alpha) Practicum in KLS: Health/Wellness (2) For in-service coaches/teachers/administrators to upgrade subject matter and develop methods and materials in health/wellness. Repeatable. Pre: coaching, teaching, or administrative experience or consent.

KLS 589 (Alpha) Practicum in KLS: Athletic Training/Sports Medicine (1) For in-service coaches/teachers/administrators to upgrade subject matter and develop methods and materials in athletic training/sports medicine. Repeatable. Pre: coaching, teaching, or administrative experience or consent.

KLS 590 (Alpha) Practicum in KLS: Athletic Training/Sports Medicine (2) For in-service coaches/teachers/administrators to upgrade subject matter and develop methods and materials in athletic training/sports medicine. Repeatable. Pre: coaching, teaching, or administrative experience or consent.

KLS 591 (Alpha) Practicum in KLS: Sports Psychology (1) For in-service coaches/teachers/administrators to upgrade subject matter and develop methods and materials in sport psychology. Repeatable. Pre: coaching, teaching, or administrative experience or consent.

KLS 592 (Alpha) Practicum in KLS: Sports Psychology (2) For in-service coaches/teachers/administrators to upgrade subject matter and develop methods and materials in sport psychology. Repeatable. Pre: coaching, teaching, or administrative experience or consent.

KLS 593 (Alpha) Practicum in KLS: Recreation/Leisure Science (1) For in-service recreation personnel to upgrade subject matter and develop methods and materials in recreation. Repeatable. Pre: recreation service experience or consent.

KLS 594 (Alpha) Practicum in KLS: Recreation/Leisure Science (2) For in-service recreation personnel to upgrade subject matter and develop methods and materials in recreation. Repeatable. Pre: recreation service experience or consent.

KLS 601 Physiology of Exercise (4) Physiological bases of modern physical training methods and sports science. Lectures, laboratory, and field experience. Pre: 253 and 254, or ANAT 301 and 302, or PHYL 301 and 302, or PHYL 401. (Cross-listed as PHYL 601)

KLS 602 Exercise Prescription and Basic ECG (3) Exercise prescriptions for normal and special populations as well as an introduction to basic ECG interpretation. Pre: 254 (or concurrent).

KLS 603 Advanced Theories of Fitness and Human Movement (3) Scientific laws and principles relevant to man’s physical and social environment as related specifically to physical fitness and human movement. Pre: 203, 253, 254, and 263, or consent.

KLS 604 Sports Nutrition and Body Weight Management (3) Application of scientifically based information to multidimensional aspects of nutrition related to sports performance. Pre: 254 (or concurrent).

KLS 605 Advanced Theory and Practice in Recreation (3) An analysis of theory and practice in recreation administration applied to selected settings with emphasis on Hawai‘i and the Asia/Pacific region.

KLS 606 Advanced Program Design and Planning in Recreation (3) Current theory and practice in recreation program design and planning applied to selected settings with emphasis on Hawai‘i and the Asia/Pacific region.


KLS 608 Muscular Strength and Power Development (3) Interpretation of scientific principles of muscular strength and power development. Design of weight training program for specific sports. Pre: 254 (or concurrent).

KLS 623 Administration in Health, Physical Education, and Recreation (3) Current problems, trends, and strategies in the administration of physical education, recreation, and fitness programs in school and non-school settings. Pre: 423 (or concurrent). (Cross-listed as EDEA 623)

KLS 634 Adapted Physical Education (3) Factors essential to practice of adapted physical education; disabilities, problems, and needs of physically challenged pupils with emphasis on accepted procedures for meeting these needs. Pre: 253, 254, and 263, or consent. (Cross-listed as SPED 634)

KLS 640 Seminar in Physical Education (3) Trends, research, and problems in instruction in physical education. Pre: 390, 391, 643, and teaching experience; or consent. (Cross-listed as TECS 640)

KLS 641 Seminar: Exercise/Sport Science and Leisure (3) Review of selected current literature in exercise/sport science and leisure studies. Practice of presentation in group setting. Pre: 673 (or concurrent) and EDEP 629 (or concurrent) or EDCL 652 (or concurrent).

KLS 643 Public School Curriculum for Physical Education (3) Detailed examination of contents of adequate curriculum for physical education in public schools. K–12. Pre: 545, 590, and 391, or consent. (Cross-listed as TESD 643)

KLS 663 Mechanical Analysis of Sports Activities (3) Analysis of variety of sports activities in terms of applications of fundamental principles of mechanics with consideration to teaching and research. Pre: consent.

KLS 673 Research Methods in KLS (3) The use of experimental designs/models in physical education research with emphasis on understanding the concepts, applications, and interpretations of statistical analysis. Pre: TESD 632 or EDEP 601 (or concurrent).

KLS 699 Directed Reading and/or Research (V) Individual reading and/or research. Pre: consent of instructor and department chair.


Korean (KOR)

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 is required in the prerequisite courses for continuation.

KOR 101 Elementary Korean (4) Listening, speaking, reading, writing, grammar. Meets one hour daily, Monday–Friday, plus daily lab work. Pre: consent. FL

KOR 102 Elementary Korean (4) Continuation of 101. Pre: 101 or consent. FL

KOR 201 Intermediate Korean (4) Continuation of 101 and 102. Meets one hour daily, Monday–Friday, plus daily lab work. Pre: 102 or consent. FL

KOR 202 Intermediate Korean (4) Continuation of 201. Pre: 201 or consent. FL

KOR 301 Third-Level Korean (3) Continuation of 201 and 202. Major emphasis on comprehension of modern written Korean, Chinese characters. Pre: 202 or consent.

KOR 302 Third-Level Korean (3) Continuation of 301. Pre: 301 or consent.

KOR 399 Directed Third-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. Offered if staff available. Repeatable. Pre: consent of department chair.
KOR 401 Fourth-Level Korean (3) Continuation of 302. Pre: 302 or consent.

KOR 402 Fourth-Level Korean (3) Continuation of 401. Pre: 401 or consent.

KOR 420 Korean Composition (3) Training in modern structural and stylistic techniques; writing on designated themes. Repeatable once. Pre: 402 or consent.

KOR 451 Structure of Korean (3) Introduction to phonology, morphology, and history. Pre: 202 or consent.

KOR 452 Structure of Korean (3) Introduction to syntax and semantics. Pre: 202 or consent.

KOR 463 Introduction to Traditional Korean Literature (3) Critical readings from earliest times and presentations that emphasize genre, style, and context. Pre: 402 or consent.

KOR 464 Introduction to Modern Korean Literature (3) Critical readings of 20th-century materials and presentations that emphasize context and the development of style. Pre: 402 or consent.

KOR 470 Language and Culture of Korea (3) Relation of Korean language to literature, history, philosophy, social structure, values, and interpersonal relationships; social and regional varieties. Pre: 402 or consent.

KOR 481 Selected Readings in Korean (3) Selected readings in various disciplines. Repeatable once with consent. Pre: 402 or consent.

KOR 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. Primarily for graduate students from other departments. Offered if staff available. Repeatable. Pre: consent of department chair.

KOR 613 (Alpha) Korean Verse (3) Intensive and analytical reading of selected works of Korean lyric and didactic verse (e.g., byangga, changga, hansi, sijo, kasa, free form): (M) modern; Pre: 464 or consent (T) traditional; Pre: 465 or consent.

KOR 614 (Alpha) Korean Narrative (3) Intensive and analytical reading of selected works of Korean narrative (e.g., myth, p'ansori, shaman song, essay, biography, fiction): (M) modern; Pre: 464 or consent (T) traditional; Pre: 465 or consent.

KOR 615 (Alpha) Korean Drama (3) Intensive and analytical reading of selected materials in Korean performing arts (e.g., spectacle, farce play, mask dance, staged narratives, theatrical drama): (M) modern; Pre: 464 or consent (T) traditional; Pre: 465 or consent.

KOR 631 History and Dialects of Korean Language (3) Survey of various hypotheses on the genetic relationship of Korean; evolution of Korean from the 15th century to the present; Korean dialects. Pre: 451 and 452, or consent.


KOR 633 Korean Syntax and Semantics (3) Review of theoretical problems in Korean syntax and semantics; different approaches; and contributions of Korean linguistic study to syntactic and semantic theory. Pre: 452 or consent.

KOR 654 Korean Sociolinguistics (3) Variations in form and use depending on sociocultural factors. Role of language in politics, mass media, group identity, bilingualism, and intercultural communication. Pre: 401, 402, 470, or consent.

KOR 640 Literary Translation of Korean (3) The art and craft of translating traditional and modern Korean literary works into English. Repeatable: Pre: 465 and 464, or consent.

KOR 699 Directed Research (V) Pre: consent.

KOR 711 Korean Historical Sources (3) Systematic reading in Korean or classical Chinese of various forms of historical literature, literary sources, reference materials; use of reference materials. Pre: reading knowledge of Korean or classical Chinese. (Cross-listed as HIST 711)

KOR 720 Research Seminar in Korean Literature (3) Advanced study of an author, school, period, genre, or problem leading to a research paper. Repeatable. Pre: consent.

KOR 730 Research Seminar in Korean Language (3) Advanced study in history and dialects, phonology and morphology, syntax and semantics, and sociolinguistics and pedagogy leading to a research paper. Repeatable. Pre: consent.

Lao (LAO)

College of Languages, Linguistics and Literature

LAO 101 Elementary Lao (4) Listening, speaking, reading, writing. Structural points introduced inductively. Daily lab work. FL

LAO 102 Elementary Lao (4) Continuation of 101. FL

LAO 112 Intensive Elementary Lao (10) LAO 201 Intermediate Lao (4) Continuation of 102. Daily lab work. Pre: 102 or equivalent. FL

LAO 202 Intermediate Lao (4) Continuation of 201. FL

LAO 212 Intermediate Lao (10)

Latin (LATN)

College of Languages, Linguistics and Literature

LATN 101 Elementary Latin (3) Grammar and vocabulary, with reading of simple Latin. FL

LATN 102 Elementary Latin (3) Continuation of 101. FL

LATN 201 Intermediate Latin (3) Development of reading and translation skills. Emphasis on prose. Pre: 102 or equivalent. FL

LATN 202 Intermediate Latin (3) Continuation of 201: emphasis on poetry. FL

LATN 303 Roman Historians (3) Selections from Caesar, Sallust, and others. Pre: 201 and 202, or consent.

LATN 304 Roman Epic (3) Selections from Virgil, Ovid, and others. Pre: 201 and 202, or consent.

LATN 425 Roman Philosophy (3) Selections from Lucretius, Cicero, and Seneca. Pre: 303 and 304, or consent.

LATN 432 Roman Drama (3) Selections from Plautus, Terence, and Seneca. Pre: 303 and 304, or consent.

LATN 433 Roman Lyric (3) Selections from Catullus, Horace, and others. Pre: 303 and 304, or consent.

LATN 438 Roman Novel (3) Selections from Petronius and Apuleius. Pre: 303 and 304, or consent.

LATN 445 Roman Satire (3) Selections from Horace and Juvenal. Pre: 303 and 304, or consent.

LATN 490 Seminar in Roman Studies (3) Study of an author or phase in Roman studies. Repeatable. Pre: 303 and 304, or consent.

LATN 650 History of Roman Literature (3) Literature from Plautus through Apuleius. Pre: graduate standing or consent.

LATN 651 Seminar in Roman Literature (3) Study of an author, genre, period, or problem leading to a research paper. Repeatable. Pre: graduate standing or consent.

LATN 660 Literature of Roman Republic (3) Selections from major prose and poetry. Pre: graduate standing or consent.

LATN 661 Literature of Roman Empire (3) Selections from major prose and poetry. Pre: graduate standing or consent.

LATN 699 Directed Research (V) Pre: consent of department chair.

Law (LAW)

School of Law

LAW 501 Pre-Admission Seminar (4) Special seminar for pre-admission students. Credits in this seminar do not count toward requirements for the JD degree. CR/NC only.

LAW 502 Pre-Admission Seminar (4) Special seminar for pre-admission students. Credits in this seminar do not count toward requirements for the JD degree. CR/NC only. Pre: 501.

LAW 503 Wildlife Law (V) Seminar covering federal and Hawai‘i laws that govern the management of wildlife resources, with a particular focus on wildlife conflicts arising in Hawai‘i.

LAW 504 Legal Method Seminar (3) Development of lawyering skills with special emphasis on legal research, argument, writing, and the psychological and ethical dimensions of lawyering.

LAW 505 Appellate Advocacy (2) Appellate brief writing and oral advocacy. Pre: 504.

LAW 506 Legal Research (1) The objective of the course is to introduce the student to the primary and secondary sources used in legal research. Lectures and library exercises are designed to complement each other so that students will learn the various starting points for doing legal research.

For key to symbols and abbreviations, see the first page of this section.
LAW 507 Employment Discrimination
(3) A study of the law of employment discrimination.

LAW 508 Negotiation/Alternative Dispute Resolution (V)
Theory and practice of negotiation and developing field of alternative dispute resolution methods. Emphasis on mediation. (Cross-listed as CE 614)

LAW 509 Contracts I (3) Survey of the law relating to the formation, validity, performance, and breach of contracts and the remedies for breach.

LAW 509L Contracts Tutorial I (1) Pre-admission program course. CR/NC only.

LAW 510 Contracts II (3) Continuation of 509. Pre: 509.

LAW 510L Contracts Tutorial II (1) Continuation of 509L. Pre: 509L.

LAW 511 Professional Responsibility (2)
Introductory consideration of selected topics relating to functions, structure, and responsibilities of the legal profession and its future role in society.

LAW 512 Hawai‘i Environmental Law (V)
Study of Hawai‘i environmental law. Examination of environmental statutes, regulations, agency guidance, policy documents and case law.

LAW 513 Criminal Justice (4)
Analysis of the rationally of criminal law in the United States role in society.

LAW 514 Law and Society in Japan (V)
An introductory consideration of Japanese law in society: Japan’s adoption and adaptation of Chinese legal doctrines, continental European legal structures and ideas, and American influences. Consideration of the structure of contemporary law in Japan: a look at the various players in the legal system, some important legal doctrines, and the real-world operation of Japan’s laws today.

LAW 515 Business Reorganization in Bankruptcy (V)
Examination of the rights and remedies available to a failing business and its creditors when the business seeks to reorganize its business and financial affairs under chapter 11 of the federal bankruptcy code. The course is structured as a 'practicum,' which tracks a single business through restructuring and emphasizes the practical and strategic aspects of law. Pre: 554 (or concurrent). Recommended: 562.

LAW 516 Civil Procedure I (3) Study of pre-trial, trial, and appellate procedures in the federal and Hawai‘i courts.

LAW 516L Civil Procedure Tutorial I (1) Pre-admission program course. CR/NC only.

LAW 517 Civil Procedure II (3) Continuation of 516. Pre: 516.

LAW 517L Civil Procedure Tutorial II (1) Continuation of 516L. Pre: 516L.

LAW 518 Real Property Law I (V) Basic course in property ownership, development, regulation. Emphasis on theory.


LAW 520 Advanced Legal Studies (V) In-depth analysis and discussion of selected current legal topics in a particular subject area, which will vary in different semesters.

LAW 521 Elder Law (V) Introduction to the myriad legal issues that confront the elderly, such as age discrimination, elder abuse, estate planning, living wills, entitlement to government benefits, and guardianship.

LAW 522 Torts Process I (2) Introduction to law, policy of civil recovery for injury, process of tort law application.


LAW 524 Advanced Torts and Insurance Law (V) Advanced study of several areas of torts, compensation and insurance law and policy of considerable contemporary importance to practicing lawyers. Recent developments in Hawai‘i tort and insurance law.

LAW 525 Feminist Legal Theory (3) Introduction to feminist legal thought for students with varying backgrounds in feminism, including those who have not yet read in feminism.

LAW 526 Group Directed Study (V)
Prepared maximum flexibility, this course allows a professor to work with a small number of students on a reading/discussion project of mutual interest. Pre: consent.

LAW 527 Topics in Environmental Law (V) An entry-level course focusing on current topics and developments in environmental law.

LAW 528 International Environmental Law (3) Study of the international regulation of activities and processes used to prevent environmental degradation and to preserve resources of environmental value. Pre: 585 (or concurrent).

LAW 529 Environmental Litigation Seminar (2) Seminar on the techniques, law, and strategy involved in federal and state court environmental litigation.

LAW 530 Second-Year Seminar (4) Seminar required for spring semester of all second-year law students. Substantial paper required. Topics announced in previous fall semester. Placement by lottery.

LAW 531 Corporations (V) Principal emphasis in the areas of agency and partnership and in the formation, control, management, and regulation of corporations.

LAW 532 Health Care Law (3) Introduction to medical jurisprudence; forensic medicine; presentation of medical evidence; medical ethics, the health-care industry, managed health-care services, financed health care, life and death decisions, and the role of government in health care.

LAW 533 Constitutional Law I (3) Introduction to judicial function in constitutional cases, jurisdiction of the U.S. Supreme Court, and discretionary barriers to judicial review.

LAW 534 Constitutional Law II (3) Advanced course in constitutional law with special emphasis on rights secured by the First, Fifth, and Fourteenth Amendments to the Constitution of the United States. Pre: 533.

LAW 535 Intellectual Property (3) Law relating to the property rights of ideas—copyrights, patenting, trademarks.

LAW 536 (Alpha) Moot Court Team (1) Preparation for and competition in moot court competition in appellate advocacy. Repeatable three times for each alpha. CR/NC only.

LAW 537 Moot Court Board (1) Research and preparation of materials for appellate advocacy. Students selected by faculty. CR/NC only.

LAW 538 Conflict of Laws (3) Problems respecting the law applicable in transactions or to relationships with elements in more than one state.

LAW 539 Remedies (3) Law of damages and unjust enrichment, rescission, restitution, injunctions, specific performance, reformation, other equitable remedies. Reference to Hawai‘i substantive law and practice.

LAW 540 Hazardous Waste Law (2) Examination of major federal statutes, regulatory and case law, and Hawai‘i counterparts. Policies behind hazardous waste laws and their impact on individuals, community, and businesses.

LAW 541 Criminal Procedure (3) Issues of free press and fair trial, illegal search and seizure, arrest and confession, speedy trial, double jeopardy are covered through student interactions as defense or prosecution attorneys and as judges.

LAW 542 Advanced Civil Procedure (V) Addresses various aspects of complex litigation and recent criticism of the civil litigation system itself. Theoretical in emphasis. Developed from two directions: (1) a study jurisprudential material concerning adversarial dispute resolution, the substance/procedure dichotomy and value-identification; and (2) in-depth analysis of procedural aspects of complex cases with special focus on new procedural rules aimed at reducing waste and delay.

LAW 543 Evidence (V) Comprehensive examination of problems of proof and rules of evidence. Concept of relevance; law of hearsay, problems of testimonial proof, theory, and operation of privileges.

LAW 544 Race, Culture, and Law (V) U.S. cases and legal theory emphasizing law in the social construction of racial categories, shifts in race-based anti-discrimination law, and the interaction of culture and law in judicial decision-making. Repeatable.

LAW 545 Law Review (1) Students selected for the Law Review editorial board have responsibility for editorial research, writing, and production of the Law Review published by the School of Law. CR/NC only.

LAW 546 Lawyering Skills (1) Theory and practice of lawyering skills.

LAW 548 Immigration Law (2) An introduction to U.S. Immigration and Nationality Law: a brief overview of historical development of immigration law; analysis of exclusion and deportation grounds and remedies; the study of both immigrant and nonimmigrant visa applications and petitions. Current law on asylum and refugee applications and U.S. citizenship and naturalization requirements.

LAW 549 Admiralty Law (3) Introduction to U.S. maritime law and admiralty jurisdiction emphasizing development of rules of maritime law and rights of seamen and maritime workers.

For key to symbols and abbreviations, see the first page of this section.
LAW 550 Corporate and Partnership Taxation (3) Examines tax aspects of formation, operation, reorganization, and liquidation of partnerships and corporations. Pre: 531, 567.

LAW 552 Wills and Trusts (4) Disposition of family wealth. Making of wills, creation, enforcement, administration, and termination of trusts; intestate succession, including probate.

LAW 553 Antitrust Law (3) Historical and legal background of governmental regulation of private property with emphasis on antitrust and anti-competitive practices.

LAW 554 Secured Transactions (V) Introduction to Uniform Commercial Code, particularly Article 9—reducing risk of nonpayment by obtaining an interest in borrowers’ property.

LAW 555 (Alpha) Externship (V) Legal work for judges and attorney supervisors in public agencies, private law firms, and the legislature. (H) Hawai‘i; (P) Pacific. CR/NC only. Pre: consent.


LAW 557 Negotiable Instruments, Payment Systems, and Credit Instruments (2) A study of the Uniform Commercial Code provisions that deal with commercial paper (Article 3), bank collections and deposits (Article 4), funds transfers (Article 4A) and letters of credit (Article 5), as well as material on alternative payment systems, including credit cards, electronic fund transfers and related federal law.

LAW 558 Public Employee Labor Law (3) Labor relations in the public sector.

LAW 559 Labor Law I (3) Regulation of union-management relations under state and federal laws.

LAW 560 Legal Accounting (2) Basic accounting concepts and methods and their reflection in financial statements.

LAW 561 Administrative Law (3) Procedure and remedies for resolving controversies between citizens and government officials exercising administrative power.

LAW 562 Debtors’ and Creditors’ Rights (V) Bankruptcy laws and rules, laws of liens, receiverships. Pre: 554 or consent.

LAW 563 Trial Practice (2) Examination of sequential stages of pre-trial and trial practice in a problem setting. Topics include investigation, pleadings, motions, discovery, voir dire examination, opening statements, direct and cross examination, closing argument, selected evidentiary problems, post-trial motions, and appellate practice. Students engage in simulated exercises, and their work is critiqued. CR/NC only. Pre: 543 or consent.

LAW 564 Pre-Trial Litigation (2) Theory and practice of civil pre-trial litigation with focus on pleading, discovery, and pre-trial motions. CR/NC only.

LAW 565 Consumer Protection Law (2) Examines common law and statutory regulation of consumer transactions. Topics include deception and unfair trade practices, fair and equal credit practice, and collection tactics.

LAW 566 American Legal History (3) Development of American law. Law as an instrument of social progress.

LAW 567 Federal Income Taxation (V) An introduction to the federal income taxation of individuals. The tax consequences of a variety of common transactions are explored, but primary emphasis is given to the theory and policy considerations that underlie specific rules. Students are expected to develop proficiency in the use of the Internal Revenue Code and Treasury Regulations.

LAW 568 Family Law (3) Legal forms of—and responses to—formation, maintenance, and dissolution of the family. Marriage, annulment, divorce, alimony, separation agreements, child custody and adoption, parentage.

LAW 569 Sales (V) In-depth study of Uniform Commercial Code, Article 2—domestic sales of goods, including warranties, manner, time and place of performance, buyers’ and sellers’ remedies for breach of contract, limitations of freedom of contract.

LAW 570 International Sales Transactions (3)

LAW 571 Federal Courts (3) An examination of the jurisdiction and law-making powers of the federal courts, including standing issues, the appellate jurisdiction of the Supreme Court, the federal-question and diversity-of-citizenship jurisdiction of the federal district courts, the immunities from suit in the federal courts possessed by governmental entities and officers, intervention by federal courts in state proceedings, and choice of law in the federal courts. Particular emphasis is placed on relevant Federal Rules of Civil Procedure. Co-requisite: 553.

LAW 572 International Protection of Human Rights (V) The growing body of international human rights laws, including procedural law and role of non-governmental organizations.

LAW 573 Jurisprudence (3) Relationships between the concepts of law and morality with views of legal and moral philosophers.

LAW 574 State and Local Government Law (3) City, town, county, district governments: administrative organization; regulatory powers; police power; local governmental taxation; relationship between local, state, and federal government.

LAW 575 Topics in International Legal Studies (V) Selected topics presented by faculty members or visiting scholars, focusing upon subjects in the Pacific and Asian area. (C) China; (J) Japan; (K) Korea; (P) Pacific; (S) Southeast Asia.

LAW 576 Directed Study and Research (V) Individual research and writing under the direction of faculty.

LAW 577 U.S.—Japan Business Transactions (V) Focus on the legal environment facing foreign businesses operating in Japan. Includes consideration of the business environment and culture, issues relating to governmental oversight, contract consciousness, corporate law, and dispute resolution. Uses the example of an actual joint venture between an American and a Japanese company as a tool for studying the relevant issues from a practical perspective.

LAW 578 Chinese Business Law (V) Introduction to Chinese business and commercial law; focus on domestic business law and property regulations, foreign investment vehicles, investment protection statutes, and dispute resolution.

LAW 579 International Business Transactions (V) Examines five or six international business transactions from the perspective of a lawyer advising a client on the tax, trade, antitrust, exchange control, and other legal aspects of the transactions.

LAW 580 Land Use Management and Control (3) Survey course of public land use management.

LAW 581 Native Hawaiian Rights (V) Status and evolution of rights of native Hawaiians to the land and its usages. Potential of utilizing native rights based on statute, custom, and use to fashion new and expanded rights.

LAW 582 Environmental Law (3) Basic policy questions and problems concerning environment. Examination of federal and Hawaiian statutes. Focus on environmental problems of Hawai‘i.


LAW 584 Civil Rights (2) This course focuses on the civil rights of Americans and introduces alternative remedies and procedures for securing these rights.

LAW 585 International Law (3) Evolving process of formulating rules to govern nations and peoples of the world in their attempts to solve problems recognized as requiring global solutions.

LAW 586 Law and Society in China (V) Overview of the historical foundations of Chinese law and introduction to the present legal system in the People’s Republic of China.

LAW 587 Asian Comparative Law (3) Introduction to the civil law tradition, focusing on East and Southeast Asia. Review of comparative law study and the historical development of civil law. Examination of the structure and role of the courts, the judicial process, constitutional law and administrative law in Western Europe and in the Asian civil law countries.

LAW 588 Legal Aspects of Water Resources and Control (2) Legal aspects of water and water rights with focus on Hawai‘i.

LAW 589 Labor and Employment Law (3) Employment law, statutory rights affecting the employment relation, and alternative contract provisions to secure the parties’ intentions. Focus on the practical application of labor and employment law. Materials relating to the

For key to symbols and abbreviations, see the first page of this section.
Library and Information Science (LIS)

College of Natural Sciences

LIS 100 Computers and Information in Arts and Humanities (3)
LIS 500 Master's Plan B/C Studies (1)
LIS 591 Library and Information Studies Workshop (1) Designed for in-service librarians and other information specialists needing to update their professional skills, focus on a particular topic, or learn new approaches and concepts. Repeatable for credit. Credits earned in these courses cannot be applied for graduate degrees.
LIS 592 Library and Information Studies Workshop (2) Designed for in-service librarians and other information specialists needing to update their professional skills, focus on a particular topic, or learn new approaches and concepts. Repeatable for credit. Credits earned in these courses cannot be applied for graduate degrees.
LIS 593 Library and Information Studies Workshop (3) Designed for in-service librarians and other information specialists needing to update their professional skills, focus on a particular topic, or learn new approaches and concepts. Repeatable for credit. Credits earned in these courses cannot be applied for graduate degrees.

For key to symbols and abbreviations, see the first page of this section.
LIS 668 The Information Industry (3) Overview of the information industry, with special emphasis on electronic publishing and entrepreneurial possibilities. Covers current and future products, services, and enabling technologies. Pre: 665.

LIS 670 Introduction to Information Storage and Retrieval (3) A survey of practices, problems, and theory relating to processing, storage, and retrieval of information in libraries, information centers, and database search services. Non-conventional and automated techniques are stressed.

LIS 672 Library Automation (3) Survey of theories, concepts, methods, and practices relating to the automation of library operations. Concentrates on systems employing superminicomputers, minicomputers, or mainframes. Pre: 605 or consent.

LIS 673 Information and Records Management (3) Introduction to the basic theories, methodologies, and technologies applicable to the management of operating records and internal data in organizations. Pre: 670 or consent.

LIS 674 Database Design and Creation (3) Lecture course on design and creation of textual numerical databases from the information specialist and database producer viewpoints. Covers need analysis, record content and structuring, software choice and design marketing. Pre: 670.


LIS 677 Human Dimension in Information Systems (3) Lecture course on human element in information systems, including physical, cognitive, and affective behaviors in interactions with nonautomated and computerized information systems. Information retrieval system use research, qualitative and quantitative research methods, cognitive science research. Pre: 670.

LIS 679 Library Systems Operation and Interpretation (3) The management and operation of automated library systems. Topics include typical systems librarian responsibilities, the computer room, hardware operation and maintenance, communications and networks, security, and human factors. Practical aspects of actual operating systems are emphasized. Pre: 672.

LIS 680 Seminar for Beginning School Librarians (1 Series of five seminar meetings on topics, issues for beginning school librarians. Includes building skills and support networks to help entry level professionals create effective school library programs. CR/NC only.


LIS 683 Services in Libraries (3) Planning and implementing services and programming in public and school libraries. Trends, issues, concerns, networking, competencies, developmental needs and interests, research, preparing grant proposals.

LIS 684 Administration of School Library Media Centers (3) Effective management of school library media centers. Philosophy and objectives, standards, personnel, facilities, resources, budget, services, library instruction, public relations, program planning and evaluation.

LIS 685 Traditional Literature and Oral Narration (3) Analysis of Pacific and Asian traditional literature emphasizing cultural values. To be used as source material for storytelling.

LIS 686 Information Literacy and Learning Resources (3) Emphasis on a process approach to information literacy and integration of information literacy instruction with components of elementary and secondary curricula. Covers evaluation and use of print and nonprint/electronic resources in various content areas. (Cross-listed as ETEC 686)

LIS 687 Information Sources for Hawaiian Studies (3) Survey of reference and research materials in Hawaiian studies. Includes historical and contemporary works, arts, humanities, social and natural sciences, AV, and other non-book sources.


LIS 689 Asian-American Resources for Children and Youth (3) Study of Asian-American resources for young people: sociohistorical roots, evaluation and selection, curricular and program uses in a multicultural context.

LIS 690 Internship (3) The internship is jointly sponsored by the school and library agencies. Selection is based on interviews, tests and possession of required competencies. Selection is by agency. CR/NC only. Pre: 601.

LIS 693 Special Topics in Librarianship (V) Course reflects interests of visiting and permanent faculty. Topics such as human relations, service to special groups, networks, reprography, etc.

LIS 694 Special Topics in Information Technology (V) This is an open-ended course intended to provide a mechanism for allowing special topics in such areas as information transfer, networks, library information systems, and information management.

LIS 695 Seminar in Research in Librarianship (3) Various methodologies and application to problems of librarianship. Evaluation of research studies; developing, writing, and criticizing proposals. Experience with statistical packages for data analysis.

LIS 696 Practicum in Librarianship (V) Skills development and application of academic study through observation and practice in a fieldwork program with accompanying seminar. Required for school library certification in Hawai’i. Repeatable once. CR/NC only. Consent of practicum coordinator required.

LIS 699 Directed Reading and/or Research (V) Individualized program of directed reading and/or research outside the scope of regularly titled course.


LIS 701 Seminar in International Librarianship (3) Comparative librarianship with emphasis on Asia and/or the Pacific Islands; professional organizations, international agencies, influence of world literacy and social, cultural, political factors.

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

LIS 715 Seminar in Information Policy and Planning (3) Public and organizational information policy and planning in society; public access; impact and control of computers and information technology. Pre: 610.

Linguistics (LING)

LING 102 Introduction to the Study of Language (3) Nature and workings of language; its role in culture and history. AH3

LING 170 The Language of Children (3) Survey of findings about the child's acquisition of language.

LING 320 General Linguistics (3) Approaches, concepts, component areas of linguistics; its development as a science.

LING 331 Computer Applications (3) Background; uses for machine translation, dictionary programs, speech synthesis, grammar modeling, etc. Pre: 320 (or concurrent) or consent.

LING 344 Languages of the World (3) Survey of major language families; typological classification and language universals; writing systems, artificial "international" languages; "contact" languages. Variety of grammatical structures illustrated by selected languages. Pre: 320 or consent. (Alt. years)

LING 345 The Polynesian Language Family (3) Introduction to the language family of Hawaiian, Samoan, Maori, Tahitian, Tongan, etc. Theories of migration and settlement. Influence of present-day languages upon sound system, grammar, and vocabulary of proto-Polynesian. Pre: 102 and some familiarity with a Polynesian language, or consent. (Alt. years)

LING 346 The Philippine Language Family (3) Introduction; phonological and grammatical systems; historical developments; emphasis on Tagalog, Cebuano, and Ilokano. Pre: 102 and a Philippine language or enrollment in Ilokano or Tagalog, or consent. (Alt. years)

LING 347 Pidgin and Creole Languages (3) Nature, history, structure, geographical distribution. Pre: 102. (Alt. years)

LING 410 Articulatory Phonetics (3) Intensive training in recognition, reproduction, and recording of human speech sounds.
preparation for fieldwork with unrecorded languages and for clinical work in speech pathology. Fall only.

LING 411 Introduction to Linguistic Anthropology (3) Ethnographic study of speech and language. Pre: consent. (Cross-listed as ANTH 414)

LING 420 Morphology (3) Theory of word structure; analysis of a variety of morphological types. Pre: 320 (or concurrent). Spring only.

LING 421 Introduction to Phonological Analysis (3) Phonological analysis and theory. Pre: 410 (or concurrent). Fall only.

LING 422 Introduction to Grammatical Analysis (3) Syntactic analysis and grammatical theory. Pre: 421 (or concurrent). Fall only.

LING 440 Semantics (3) Linguistic semantics, including lexical and logical semantics, and an introduction to speech acts. Pre: 320 or consent. (Alt. years)

LING 451 Introduction to Linguistic Structure (3) Phonological and grammatical structures of a previously uncodified language are determined by linguistic analysis of data obtained from speakers of the language. Pre: 102 or 320.


LING 499 Directed Research (V) Repeatable up to 3 credit hours. CR/NC only. Pre: one 400-level linguistic course and consent.

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

LING 611 Acoustic Phonetics (3) Stream of speech analyzed according to acoustic properties and function in given languages; articulatory correlates. Use of sound spectrograph. Pre: 410.

LING 615 The Nature of Language (3) Language as a communication system, current theories of grammar, meaning, sociolinguistics, linguistic change and comparison.

LING 616 Biological Foundations of Language (3) Human anatomy and neurology in relation to language and linguistic theory. Pre: 422.

LING 621 Phonology (3) Phonological theory and problems of analysis. Pre: 421. Spring only.

LING 622 Grammar (3) Grammatical theory and problems of analysis. Pre: 422. Spring only.

LING 623 Semantics and Pragmatics (3) Ways in which the interpretation of sentences in natural language depends upon the literal meaning of propositions and their logical (semantic) and conversational (pragmatic) inferences. Pre: 422 or consent.

LING 624 Discourse Grammar (3) Phonological, grammatical, semantic, and pragmatic dimensions of spoken and written discourse, placing the level of sentence grammar in context. Pre: 622 (or concurrent) or consent.

LING 625 Mathematical Properties of Natural Languages (3) Construction of logical and other mathematical systems that mirror properties of natural languages. Pre: 622 or background in formal logic.

LING 630 Field Methods (3) Work with native speakers of lesser-known languages to develop techniques for data collection and analysis. Repeatable. Pre: 421 and 422.

LING 631 Language Data Processing (3) Preparation of language data for computer processing: use ready-made programs; write simple language processing programs using SNOBOL4. Applications to student’s research. Pre: 422.

LING 635 Language Variation (3) Review of various approaches to class, style, regional, and other variation; including sociolinguistics, dialectology, and studies of language contact, diglossia, pidgins, and creoles. Pre: 622.

LING 640 (Alpha) Topics in Linguistics (3) History of the discipline, schools of linguistic thought, current issues, etc. Repeatable: (E) English linguistics; (F) phonology and phonetics; (G) general; (H) history of the discipline; (S) sociolinguistics; (T) theory; (X) syntax; (Y) psycholinguistics. Pre: consent.

LING 645 The Comparative Method (3) Introduction to historical-comparative linguistics; attention to both Indo-European and languages within or without recorded sources. Pre: 421 and 422, or consent. Fall only.

LING 646 The Comparative Method (3) Continuation of 645. Pre: 454. Spring only.


LING 660 Historical Linguistics (3) Survey of research in history of particular languages or language families. Repeatable. Pre: 645.

LING 661 Proto-Austronesian (3) Introduction to Austronesian comparative linguistics; Dempwolff’s reconstruction and subsequent modifications; problems of subgrouping. Pre: 645.

LING 662 Indo-European (3) Reconstruction of proto-Indo-European, based mainly on five older languages (Sanskrit, Classical Greek, Latin, Old Church Slavic, Gothic). Pre: 645.

LING 663 Indo-European (3) Continuation of 662. Pre: 662.

LING 670 Developmental Linguistics (3) Survey of the literature in language acquisition; emphasis on relation to linguistic theory. Pre: 410, 421, and 422.

LING 699 Directed Research (V) CR/NC only. Repeatable. Maximum 6 credit hours. Pre: graduate standing and consent.

LING 700 Thesis Research (V) Repeatable up to 12 credit hours.

LING 750 (Alpha) Seminar (3) Reporting and discussion of current research in linguistics. Repeatable. (C) data language processing; (E) ethno-linguistics; (F) phonology and phonetics; (G) general; (M) semantics; (Q) language acquisition; (R) written language; (S) sociolinguistics; (T) theory; (X) syntax; (Y) psycholinguistics. Pre: consent.

LING 751 Literacy and Language (3) A survey of the literature on literacy, emphasizing origins and development, varieties of scripts, and the cognitive and social aspects of visual language. Pre: 422 or consent.

LING 760 Problems in Comparison and Prehistory (3) Reconstruction, classification, divergence measures, dialect geography, other historical-comparative studies. Repeatable. Pre: 645, 660, 661, 662, or 663 where applicable.

LING 770 Areal Linguistics (3) Structures of languages of various areas of the world; diffusion. Repeatable. Pre: 622.

LING 799 Apprenticeship in Teaching Linguistics (V) An experience-based introduction to college-level teaching; doctoral students serve as student teachers to professors; responsibilities include supervised teaching and participation in planning and evaluation. Repeatable. Pre: admission to doctoral program and consent.

LING 800 Dissertation Research (V)

Management (MGT)

College of Business Administration

MGT 321 Productivity Management (3) Improving productivity of worker and machine hours devoted to procurement, production, distribution of products, services, or information. Includes work measurement, inventory control, scheduling, quality control. Pre: BUS 315 and 316.

MGT 322 Operations Management Applications (3) Applications of operations management concepts with emphasis on production planning and control, quality control, analytical methods, and systems analysis. Pre: BUS 315 and 316.

MGT 341 Behavior in Organizations (3) Contributions made by sociology, psychology, and related behavioral sciences to the understanding and prediction of human behavior in organizations. Pre: BUS 315.

MGT 342 Multinational Business Management (3) Introduction to the unique problems and challenges in managing multinational business enterprises. Systems approach to the management process in such multinational firms stressed. Pre: BUS 315.


MGT 344 Seminar in Management (3) In-depth analysis of selected current practices and trends in administration. May be repeated with change in topic. Pre: consent.


MGT 350 (Alpha) Topics in Management (3) Advanced domestic and international management topics. (B) Chinese management and industrial relations. Pre: BUS 315.
MGT 399 Directed Reading and Research (V) Reading and research in a special area within the major field 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.

MGT 460 Asia Pacific Business Systems (3) Business systems in Asia Pacific countries including Japan, Korea, China, Taiwan, Singapore, and Hong Kong in terms of particular strategies and how they relate to the industrial trade policies. Pre: BBA core excluding BUS 345, or consent.

MGT 605 Production and Operations Management (3)

MGT 643 (Alpha) Advanced Organizational Behavior (3) (B) experiential learning (EL); (C) organizational development (OD) and major concepts in organizational behavior.

MGT 644 Comparative Management (3) Cross-cultural analysis of the values and environmental constraints that shape management patterns and policies. Emphasis on Pacific area nations.

MGT 645 New Venture Management (3) Technical aspects of entrepreneurship, components and requirements for developing a business plan.

MGT 646 Production and Operations Management (3)

MGT 648 International Business: Environment and Enterprise (3)

MGT 650 Management Topics (3) In-depth analysis of selected current practices and trends in administration. May be repeated with change in topic. Pre: consent.

MGT 660 Negotiation (3) Theory and practice of negotiation. Exploration of appropriate strategies, tactics, and communication techniques. Study of dyadic multi-party, cross-cultural, and assisted negotiations.

MGT 670 (Alpha) International Management and Industrial Relations (3) Selected topics in international management and industrial relations: (B) Chinese management systems; (C) Japanese management systems; (D) management of multinational corporations; (E) Asian/Pacific entrepreneurship; (F) contemporary issues in international business foreign direct investment; (G) cross-cultural communication in international business; (H) interactive strategies in Asian culture; (I) international human resource management; (J) international joint ventures; (K) international management of technology; (M) Korean management systems; (N) multinational corporation and environmental issues; (O) strategy of the multinational corporation; (P) international transfer of technology. Pre: consent.

MGT 679 Knowledge-based Strategy (3) Introduces students to knowledge-based theory of the firm and provides structured learning environment to apply this theory to identify business development and investment opportunities. Pre: BUS 613 or consent.

Marketing (MKT) College of Business Administration

MKT 311 Consumer Behavior (3) Analysis of consumer behavior and motivation: principles of learning, personality, perception, and group influence, with emphasis upon mass communication effects. Pre: BUS 312 or consent. (Cross-listed as PSY 385)

MKT 321 Marketing Research (3) Research aids to marketing management: nature of the research process; planning research including problems of sampling and measurement; experimental and non-experimental methods and techniques; analysis of data. Pre: BUS 312 and DS 305, or consent.

MKT 351 Advertising and Promotion Management (3) In-depth coverage of the major communication tools used in marketing such as advertising, sales promotion, direct marketing, and public relations. Pre: BUS 312 or consent.

MKT 352 Advertising Campaigns (3) Planning and development of advertising campaigns, development of the message, and execution of broadcast and print advertisements and advertising research. Pre: 331 or consent.

MKT 341 Retailing Management (3) Principles, functions, and analysis of opportunities and problems in retailing: location and layout; merchandise planning; buying and selling; organizational forms and design; expense analysis and control; coordination of store activities. Pre: BUS 312 or consent.

MKT 351 Professional Selling (3) Emphasis on selling technique, social-psychological principles of persuasion, and interpersonal communication. Lecture, discussion, and application of relevant principles and techniques. CR/NC only. Pre: BUS 312 or consent.

MKT 361 Seminar in Marketing (3) Study and discussion of significant topics and problems in the field of marketing. May be repeated with change in topic. Pre: consent and usually senior standing.

MKT 362 Internet Marketing (3) Examines use of the Internet in the marketing of goods and services; for example new product development, marketing research, direct sales and marketing communications on the World Wide Web. Real world projects provide opportunities for application. Pre: BUS 311 and BUS 312; or consent.

MKT 363 Database Marketing (3) This course covers the evolving fields of database marketing. Students learn optimal ways of developing and using a customer database to design, implement and evaluate direct, loyalty and other marketing programs. A-F only. Pre: BUS 311 and MKT 321; or consent.

MKT 371 Marketing Management (3) Real world decision-making simulation providing strategic experience in a group setting. Pre: BUS 312 or consent.

MKT 381 Multinational Marketing (3) Principles and topics related to international marketing, with emphasis on strategic planning and applications. Pre: BUS 312 or consent.

MKT 391 Marketing Strategies (3) Decision-making by the marketing executive; integration of all elements of the marketing program based on actual business situations. Pre: 311, 321, and one other marketing course above 311; or consent.

MKT 399 Directed Reading and Research (V) Reading and research in a special area of 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 the faculty adviser.

MKT 410 Software Tools in Marketing (3) This course focuses on computer software tools designed to help managers make more informed marketing decisions. Through hands-on experience, students learn software skills useful in marketing management, marketing research, sales and advertising. A-F only. Pre: BUS 310 and BUS 312; or consent.

MKT 411 (Alpha) Topics in Marketing (3) Selected topics in marketing. (B) Entrepreneur marketing; (C) Asia market analysis. Pre: BUS 312 or consent.

MKT 651 Advanced Marketing Management (3) A case course in the application of advanced marketing methods. Pre: BUS 615 or consent.

MKT 652 Japanese Marketing Systems (3) Specialized study of Japanese marketing systems, considers both global and domestic marketing activities in the context of the Japanese economy. Pre: BUS 615 or consent.

MKT 653 International Marketing Management (3) Integrated and comparative approach to international marketing management. Emphasis on the development of a competitive strategy in a global environment. Applications to both developing and industrialized markets. Pre: BUS 615 or consent.

MKT 654 Promotion Management and Strategy (3) Emphasis on the major communication tools of advertising, personal selling, sales promotion, and publicity used to motivate consumers to action; includes relevant consumer behavior theory. Pre: BUS 615 or consent.

MKT 655 Marketing Research Methodology (3) Research aids to marketing management: problem specification, hypothesis formulation, sample design, questionnaire construction, data collection, analysis, and policy recommendations. Pre: BUS 615 or consent.

MKT 656 Creativity in Marketing (3) Thought processes that relate to creativity. Through a series of exercises, students experience enriched creativity and enhanced communication skills. Pre: BUS 615 or consent.

MKT 657 Services Marketing (3) Conceptual understanding of distinctive aspects of services, services management, and services research. Pre: BUS 615 or consent.

MKT 690 Advanced Seminar in Marketing (3) Significant topics, problems in marketing. May be repeated with change in topic. Pre: BUS 615 or consent.

For key to symbols and abbreviations, see the first page of this section.
Mathematics (MATH)
College of Natural Sciences

MATH 100 Survey of Mathematics (3) Selected topics designed to acquaint nonspecialists with examples of mathematical reasoning. May not be taken for credit after 205 or higher. M/L

MATH 111 Introduction to Mathematics (3) Study of concepts and properties of number systems. Prospective elementary education majors only; not applicable to arts and sciences requirements. Pre: two years of high school algebra, one year of geometry, and placement test. M/L

MATH 140 Trigonometry and Analytic Geometry (3) Functions, with special attention to polynomial, rational, exponential, logarithmic, and trigonometric functions, plane trigonometry, polar coordinates, conic sections. Pre: two years of high school algebra, one year of plane geometry, and precalculus assessment. M/L

MATH 205 Calculus for Business and Social Sciences (3) Basic concepts; differentiation and integration; applications to management, finance, economics, and the social sciences. Pre: two years of high school algebra, one year of plane geometry, and precalculus assessment. M/L

MATH 215 Applied Calculus I (4) Basic concepts; differentiation, differential equations and integration with applications directed primarily to the life sciences. Pre: C or better in 140 or precalculus assessment.

MATH 216 Applied Calculus II (3) Differential calculus for functions in several variables and curves, systems of ordinary differential equations, series approximation of functions, continuous probability, exposure to use of calculus in the literature. Pre: 215 or consent.

MATH 231 Calculus III (3) Parametric curves, polar coordinates; vector-oriented study of functions of several variables; partial derivatives. Pre: a grade of C or better in 206 and 206L (or concurrent).

MATH 232 Calculus IV (3) Multiple integrals; line integrals; Green’s Theorem, surface integrals; first and second order ordinary differential equations. Pre: 231 or consent.

MATH 241 Calculus I (4) Basic concepts; differentiation with applications; integration. Pre: a grade of C or better in 140 or 215 or precalculus assessment. M/L

MATH 242 Calculus II (3) Integration techniques and applications, series and approximations. Pre: a grade of C or better in 241 or 251 or a grade of B or better in 215. Co-requisite: 242.


MATH 301 Introduction to Discrete Mathematics (3) Symbolic logic, sets and relations, algorithms, trees and other graphs. Additional topics chosen from algebraic systems, networks, automata. Pre: one semester of calculus from mathematics department and one semester programming; or consent. Recommended: MATH 197.


MATH 303 Introduction to Differential Equations II (3) Constant coefficient linear systems, variable coefficient ordinary differential equations, series solutions and special functions, Fourier series, partial differential equations. Pre: 302, 311 (or concurrent); or consent.

MATH 311 Introduction to Linear Algebra (3) Algebra of matrices, linear equations, real vector spaces and transformations. Pre: 251 or consent.

MATH 321 Introduction to Advanced Mathematics (3) Formal introduction to the concepts of logic, finite and infinite sets, functions, methods of proof and axiomatic systems. Pre: 231 or consent.

MATH 351 Foundation of Euclidean Geometry (3) Axiomatic Euclidean geometry and introduction to the axiomatic method. Pre: 251 and 321 (or concurrent); or consent.

MATH 352 Non-Euclidean Geometries (3) Hyperbolic, other non-Euclidean geometries. Pre: 351 or consent.

MATH 371 Elementary Probability Theory (3) Sets, discrete sample spaces, problems in combinatorial probability, random variables, mathematical expectations, classical distributions, applications. Pre: 206 or consent.

MATH 375 Elementary Statistics (3) Estimation, tests of significance, the concept of power. Pre: 371 or consent.

MATH 402 Partial Differential Equations I (3) Integral surfaces and characteristics of first and second order partial differential equations. Applications to the equations of mathematical physics. Pre: 232 or consent.

MATH 403 Partial Differential Equations II (3) Laplace’s equation, Fourier transform methods for PDEs, higher dimensional PDEs, spherical harmonics, Laplace series, special functions and applications. Pre: 402 or consent.

MATH 404 Ordinary Differential Equations (3) Systems of linear ordinary differential equations, autonomous systems, and stability theory applications. Optional topics include series solutions, Sturm theory, numerical methods. Pre: 252 and 311, or consent.

MATH 407 Numerical Analysis (3) Numerical solution of equations, interpolation, least-squares approximation, quadrature, eigenvalue problems, numerical solution of ordinary and partial differential equations. (These topics are covered in the year sequence 407–408.) Pre: 232, 311, and one semester programming; or consent. Recommended: MATH 197.

MATH 408 Numerical Analysis (3) Continuation of 407. This is the second course of a year sequence and should be taken in the same academic year as 407. Pre: 407 or consent.

MATH 411 Linear Algebra (3) Vector spaces over arbitrary fields, minimal polynomials, invariant subspaces, canonical forms of matrices; unitary and Hermitian matrices, quadratic forms. Pre: a grade of B or better in 311 or consent.

MATH 412 Introduction to Abstract Algebra (3) Introduction to basic algebraic structures. Groups, finite groups, abelian groups, rings, integral domains, fields, factorization, polynomial rings, field extensions, quotient fields. (These topics are covered in the year sequence 412–413.) Pre: 311 or consent.

MATH 413 Introduction to Abstract Algebra (3) Continuation of 412. This is the second course of a year sequence and should be taken in the same academic year as 412. Pre: 412 or consent.

MATH 414 Operations Research: Discrete Models (3) Techniques of mathematical programming. Topics may include linear programming, integer programming, network analysis, dynamic programming, and game theory. Pre: 311 or consent.


MATH 420 Introduction to the Theory of Numbers (3) Congruences, quadratic residues, arithmetic functions, distribution of primes. Pre: 311 or consent.

MATH 421 Topology (3) Geometric and combinatorial topology. Surfaces, homology, Euler characteristics, winding numbers, Jordan curve theorem. Pre: two courses from 311, 321, 351, 411, 412, or 420, or consent.

MATH 431 Advanced Calculus I (3) Topology of R^n, continuous functions, Riemann integration, sequences and series, uniform convergence, implicit function theorems, differentials and Jacobians. (These topics are covered in the year sequence 431–432.) Pre: three courses from 311, 321, 412, 413, 420, 455, 471, or consent.

MATH 432 Advanced Calculus II (3) Continuation of 431. This is the second course of a year sequence and should be taken in the same academic year as 431. Pre: 431 or consent.

MATH 442 Vector Analysis (3) Vector operations, wedge product, differential forms, and smooth mappings. Theorems of Green, Stokes, and Gauss, both classically and in terms of forms. Applications to electromagnetism and mechanics. Pre: 232 and 311, or consent.

MATH 443 Differential Geometry (3) Properties and fundamental geometric invariants of curves and surfaces in space; applications to the physical sciences. Pre: 232 (or concurrent) and 311, or consent.

MATH 444 Complex Variable (3) Analytic functions, complex integration, introduction to conformal mapping. Pre: 252 and 311, or consent.

MATH 449 (Alpha) Topics in Undergraduate Mathematics (3) Advanced topics from various areas: algebra, number theory, analysis, and geometry. Repeatable course: consent.

MATH 454 Axiomatic Set Theory (3) Sets, relations, ordinal arithmetic, cardinal arithmetic, axiomatic set theory, axiom of choice and the continuum hypothesis. Pre: 321 or graduate standing in a related field or consent. Not open to mathematics graduate students.

MATH 471 Probability (3) Probability spaces, random variables, distributions, expectations, moment generating and characteristic functions, limit theorems. Continuous probability emphasized. Pre: 232 (or concurrent) and 371, or consent.

MATH 472 Statistical Inference (3) Sampling and parameter estimation, tests of hypotheses, correlation, regression, analysis of variance, sequential analysis, rank order statistics. Pre: 473 or consent.

MATH 475 Combinatorial Mathematics (3) Finite configurations. Topics may include counting methods, generating functions, graph theory, map coloring, block design, network flows, analysis of discrete algorithms. Pre: 511 or consent.

MATH 499 Directed Reading (V) Limited to advanced students who must arrange with an instructor before enrolling. Repeatable once for a maximum of 3 credits each.

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

MATH 511 Writing and Problem Solving (2) Exploration of topics in algebra, analysis, and geometry, with emphasis on writing skills, experimentation, mathematical thinking, and problem solving. Enrollment limited to mathematics teachers.

MATH 602 Ordinary and Partial Differential Equations (3) Classical existence and uniqueness theory for ODEs and PDEs, qualitative properties, classification, boundary value and initial value problems, fundamental solutions, other topics. (These topics are covered in the year sequence 602–603.) Pre: 402, 431, 432, or 442, or consent.

MATH 603 Ordinary and Partial Differential Equations (3) Continuation of 602. This is the second course of a year sequence and should be taken in the same academic year as 602. Pre: 602.


MATH 611 Modern Algebra (3) Modules, Sylow theorems, Jordan-Hölder theorem, unique factorization domains, Galois theory, algebraic closures, transcendence bases. (These topics are covered in the year sequence 611–612.) Pre: consent.

MATH 612 Modern Algebra (3) Continuation of 611. This is the second course of a year sequence and should be taken in the same academic year as 611. Pre: 611.

MATH 613 Group Theory (3) Sylow theorems, nilpotent and solvable groups, extension theory, representation theory, additional topics. Pre: consent.

MATH 615 Ring Theory (3) Ideal theory in Noetherian rings, localization, Dedekind domains, the Jacobson radical, the Wedderburn-Artin theorem, additional topics. Pre: consent.

MATH 618 Lattice Theory (3) Introduction with applications to general algebra. Partially ordered sets, decomposition theory, representations of lattices, varieties and free lattices, coordinatization of modular lattices. Pre: 612 or consent.

MATH 619 Universal Algebra (3) Introduction to basic techniques, including subalgebras, congruences, automorphisms and endomorphisms, varieties of algebras, Mal'cev conditions. Pre: 612 or consent.

MATH 621 Topology (3) Properties of topological spaces; separation axioms, compactness, connectedness; metrizability; convergence and continuity. Additional topics from general and algebraic topology. (These topics are covered in the year sequence 621–622.) Pre: consent.

MATH 622 Topology (3) Continuation of 621. This is the second course of a year sequence and should be taken in the same academic year as 621. Pre: 621.

MATH 625 Differentiable Manifolds I (3) Differentiable structures on manifolds, tensor fields, Frobenius theorem, exterior algebra, integration of forms, Poincare Lemma, Stoke's theorem. Pre: 411, 432, and 622, or consent.

MATH 631 Theory of Functions of a Real Variable (3) Lebesgue measure and integral, convergence of integrals, functions of bounded variation, Lebesgue-Stieljes integral and more general theory of measure and integration. (These topics are covered in the year sequence 631–632.) Pre: consent.

MATH 632 Theory of Functions of a Real Variable (3) Continuation of 632. This is the second course of a year sequence and should be taken in the same academic year as 631. Pre: 631.


MATH 635 Potential Theory (3) Primary classical and modern analysis pertaining to Dirichlet's problem. Integral equations, extremum problems, Brownian motion. Pre: 632 or consent.

MATH 637 Calculus of Variations (3) Simple variational problems, first and second variation formulas. Euler-Lagrange equation, direct methods, optimal control. Pre: 432 or consent.

MATH 644 Analytic Function Theory (3) Conformal mapping, residue theory, series and product developments, analytic continuation, special functions. (These topics are covered in the year sequence 644–645.) Pre: consent.

MATH 645 Analytic Function Theory (3) Continuation of 644. This is the second course of a year sequence and should be taken in the same academic year as 644. Pre: 644.

MATH 649 (Alpha) Topics in Mathematics (3) Commutative rings, function theory, geometric topology, transformation groups, etc. Repeatable. Pre: consent.

MATH 655 Set Theory (3) Axiomatic development, ordinal and cardinal numbers, recursion theorems, axiom of choice, continuum hypothesis, consistency and independence results. Pre: consent.

MATH 657 Recursive Functions and Complexity (3) Recursive, r.e., Ptime, and Logspace classes. Nondeterminism, parallelism, alternation, and Boolean circuits. Reducibility and completeness. Pre: 455, ICS 441, or consent.

MATH 671 Advanced Probability (3) Independence and conditioning, martingales, ergodic theory, Markov chains, central limit theorem. Pre: 651 or consent.

MATH 672 Stochastic Processes (3) Stationary, Gaussian, and Markov processes. Pre: 671 or consent.


MATH 699 Directed Reading and Research (V) Maximum of 3 credit hours. Repeatable three times. Pre: graduate standing and consent.


MATH 799 Apprenticeship in Teaching (V) An experience-based introduction to college-level teaching; students serve as student teachers to professors; responsibilities include supervised teaching and participation in planning and evaluation. Open to graduate students in mathematics only. Repeatable once. CR/NC only. Pre: graduate standing in mathematics and consent.

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

MDHX

See Medical History

Mechanical Engineering (ME)

College of Engineering

Preference in registration is given to declared engineering majors. Please consult the current Schedule of Courses for confirmed offerings each semester.

ME 113 Introduction to Engineering Design (3) Introductory experience in analysis, synthesis, computer-aided drafting, and communication in engineering, professional ethics and social responsibility. Pre: high school physics or consent.

ME 301 Mechanical Engineering Experimentation (2) (1 Lec, 1 2-hr Lab) Design of test setups and procedures to determine the performance of a product. Pre: junior standing.


ME 312 Applied Thermodynamics (3) Gas mixtures, generalized thermodynamic relationships, combustion and thermochimistry, chemical equilibrium, power and refrigeration cycles. Pre: grade of C or better in 311.

For key to symbols and abbreviations, see the first page of this section.
For key to symbols and abbreviations, see the first page of this section.
ME 622 Convection Heat Transfer (3) Heat transfer in laminar and turbulent boundary layers. Analogy between heat, momentum, mass transfer. Pre: 422 and 626.


ME 626 Viscous and Turbulent Flows (3) Navier-Stokes and energy equations, their formulation, properties: some exact solutions; laminar boundary layers; laminar stability, transition, turbulence; turbulent boundary layers. Pre: 322.

ME 627 Environmental Heat, Mass, and Momentum Transfer (3) Heat and mass transfer in Earth’s interior with applications to geothermal and petroleum reservoir engineer- ing. Pre: 422 or consent.


ME 629 Renewable Energy Engineering I: Biomass (3) (1 Lec, 2 2-hr Lab) Experimental methods and theory of thermochemical biomass conversion: static and dynamic temperature and mass measurements, thermogravimetry, differential scanning calorimetry, GCMS and HPLC techniques. Pre: consent.


ME 656 Fundamentals of Electrochemistry (3) Thermodynamics of cells, electrode kinetics, mass transfer by migration and diffusion, microelectrode techniques, forced convection, impedance, double-layer structure, and absorbed intermediates in electrode processes. Pre: consent.

ME 642 Mechanical Behavior of Engineering Materials (3) Mechanical property tests. Stress concentrations. Fracture mechanics; applications to materials failures and to selection of materials; emphasis on mechanical engineering applications. Pre: consent.

ME 646 Mechanics and Design Composites (3) Introduction to composites; anisotropic elasticity and laminate theory; hygrothermal effects; composite beams, columns, rods, plates, and shells; energy method; failure theories; joining of composites; computer-aided design in composites. Pre: 371 or consent.

ME 651 Automatic Control (3) Linear optimal feedback control, discrete time optimal control, fundamentals of adaptive control, application to motion and force control of robot arms and manipulators. Pre: 451, EE 451, or consent.


ME 662 Computer Vision (3) Image formation, filtering, edge detection and other forms of image enhancement, segmentation of image into meaningful regions, techniques for analyzing motion, creation of models representing scene and image understanding. Psychological and physiological aspects of human vision will be discussed. Pre: graduate standing.

ME 671 Elliptic and Hyperbolic Partial Differential Equations (3) Cartesian tensors in mechanics, coordinate transforma- tions, analysis of stress and strain, principal values, invariants, equilibrium and compatibil- ity equations, constitutive relations, field equations. Problems in elasticity. Pre: 371 or CE 370, or consent. (Cross-listed as ME 671)

ME 672 Finite Element Analysis (3) Introduction to finite element analysis and design in mechanical engineering. Applications to machine design, vibrations, elasticity, heat transfer. Pre: 371, 360, or consent.

ME 675 Digital Spectral Analysis (3) System identification using discrete Fourier transform (DFT) methods. Deterministic and random signal analysis. Windows, aliasing, FFT; Z-transform and DFT; real-time data acquisition and analysis using microcomputers. Pre: 375, EE 315, ICS 445, or consent.

ME 678 Advanced Dynamics (3) Lecture course on rigid-body dynamics. Topics include: dynamical systems; motion representation and constraints; Newtonian mechanics; Lagrangian mechanics; Hamilton’s principle; stability analysis; introduction to multibody dynamics. Pre: 375 or equivalent; or consent.

ME 686 Air Pollution, Toxics, and Control (3) Chemical mechanisms of formation and destruction of major air pollutants, transport phenomena, and health and environmental impacts. Evaluation of source and control technologies. Current and pending regulations and policies. Open to nonmajors. Pre: PHYS 170 and CHEM 171 or equivalent, or consent. (Cross-listed as PH 686)

ME 691 Seminar (1) Current problems in all branches of mechanical engineering. All graduate students are required to attend; registrants are expected to present talks. Pre: graduate standing.

ME 696 Advanced Topics in Mechanical Engineering (V) Highly specialized topics in thermosciences, mechanics, materials, system, or design. Pre: consent.

ME 699 Directed Reading or Research (V) Directed study on subject of mutual interest to student and a staff member. Student must find faculty sponsor before registering. Pre: graduate standing.


ME 799 Directed Instruction (V) Student assists in undergraduate classroom and/or project instruction under the direction and close supervision of faculty member. CR/NC only. Pre: admission to PhD candidacy or consent.

ME 800 Dissertation Research (V) Research for doctoral dissertation. Pre: candidacy for PhD in mechanical engineering.

Medical History (MDHX)
School of Medicine

MDHX 606 Medical History (1) Philosophy and history of medicine with special reference to contributions from the Pacific Islands and Asia, and interrelationships of historical, ethical, social, and scientific aspects of medicine.

MDHX 699 Directed Research (V)
MEDT 457L Clinical Lab Methods and Analyses Lab I (2) (1 6-hr Lab) Lab experiments illustrating fundamental principles and methods of clinical laboratory analyses. Co-requisite: 457.

MEDT 458L Clinical Lab Methods and Analyses II (3) Continuation of 457.

MEDT 458L Clinical Lab Methods and Analyses II (2) (1 6-hr Lab) Continuation of 457L. Co-requisite: 458.

MEDT 464 Immunohematology (3) (2 Lec, 1 3-hr Lab) Antigen-antibody relationships in human blood, study of blood groups, clinical problems in transfusion. Pre: MICR 461 or consent.

MEDT 471 Clinical Biochemistry (4) Biochemical processes in human health and disease states. Repeatable. Pre: BIOM 531 or PHYL 302 (or concurrent); and BIOC 441; or consent. Spring only.

MEDT 495 Special Topics in Medical Technology (V) Acquaints student with role of the medical technologist and overlap of major sciences in clinical situations to help student develop qualities unique to medical technology. CR/NC only. Pre: consent.

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

MEDT 510 Clinical Training in Medical Technology (26) Application of theory and simulated laboratory experiences in immunohematology, clinical chemistry, microbiology, parasitology, hematology, coagulation, urinalysis, immunology, to meet stated career entry-level competencies. Pre: BS in MEDT.

MEDT 609 Seminar in Medical Technology (1) Analysis of research and recent literature pertaining to various aspects of medical technology. Pre: consent.

MEDT 695 Special Topics in Medical Technology (2) Current research, discoveries, inventions, methods, and/or techniques in clinical laboratory medicine. Pre: consent.

MEDT 599 Directed Research (V) Pre: consent.

Meteorology (MET)
School of Ocean and Earth Science and Technology

MET 101 Introduction to Meteorology (3) For nonscience majors and prospective science teachers. Basic atmospheric physics, sun-Earth-atmosphere interrelationships, pollution, major weather systems, weather forecasting, weather of Hawaii. NS2

MET 101L Introduction to Meteorology Lab (1) (1 3-hr Lab) Exercises with meteorological data and measurement systems. Characteristics of Hawaiian winds, temperatures, and rainfall. Pre: 101 (or concurrent). NS2

MET 200 Descriptive Meteorology (3) Atmospheric variables and gas laws, radiation processes, thermodynamics, clouds and precipitation, atmospheric circulation, mid-latitude and tropical systems, forecasting, weather applications, climate. Pre: PHYS 215L or concurrent.

MET 302 Atmospheric Physics (3) Energy and thermodynamics, statics and stability, physical processes of cloud formation, radiation and Earth-atmosphere heat balance, kinetic theory, optical effects. Pre: MATH 242 or consent.

MET 303 Introduction to Atmospheric Dynamics (3) Basic laws of hydrodynamics, equations of motion, kinematics, divergence and vorticity, viscosity and turbulence, introduction to numerical weather prediction, general circulation. Pre: 302 and MATH 241, or consent.

MET 305 Meteorology Instruments Observations (3) (2 Lec, 1 3-hr Lab) First- and second-order measurement systems. Response of wind, temperature, and recording instruments. Discussion of advanced system including radar. Planning of field programs. Pre: PHYS 152 and PHYS 215L, or PHYS 272 and 272L, or consent.

MET 310 Global Environmental Change (3) Global environmental change problems such as carbon dioxide and the greenhouse effect, acid rain, chlorofluorocarbons and the ozone layer, global deforestation and the effect on climate, etc. Pre: only environmental science course. (Cross-listed as OEST 310 and OCN 310)

MET 310L Global Environmental Change Laboratory (2) (1 2-hr Lab) Laboratory course to supplement MET 310. Quantitative aspects of global environmental change will be addressed through problem-solving and computer modeling. AF only. Pre: MATH 241, MATH 242, PHYS 170, PHYS 170L, CHEM 161L, and CHEM 161L or consent. Co-requisite: 310. (Cross-listed as OCN 310L and OEST 310L)

MET 402 Applied Atmospheric Dynamics (3) Advanced concepts in dynamics: vorticity, cyclogenesis, jet streams, fronts, mesoscale circulations. Pre: 305 or consent.

MET 405 Satellite Meteorology (3) (2 Lec, 1 3-hr Lab) Orbital elements, ephemerides, viewing geometry; radiation, satellite sensors; interpreting satellite data; applications to synoptic meteorology and forecasting. Pre: 302 or consent.

MET 406 Tropical Meteorology (3) History; tropical clouds and hydrometeors: typhoons; monsoons; local and diurnal effects. Pre: 305 or consent.

MET 412 Meteorological Analysis Lab (3) (2 3-hr Lab) Techniques of portraying and analyzing atmospheric structure and weather systems in middle and high latitudes; modern methods of forecasting extratropical systems. Pre: 303 or (concurrent) or consent. (Alt. years)

MET 416 Tropical Analysis Lab (3) (2 3-hr Lab) Techniques of portraying and analyzing atmospheric structure and weather systems in tropical and equatorial regions; forecasting tropical systems. Pre: 303 or (concurrent) or consent.

MET 600 Atmospheric Dynamics I (3) Governing equations for moist atmospheric motions, approximations, basic theoretical models, boundary layer dynamics, atmospheric waves, quasi-geostrophic theory for mid-latitudes. Pre: 303, and one of MATH 420 or MATH 405, or consent.

MET 601 Atmospheric Dynamics II (3) Overview of dynamic meteorology, numerical weather prediction, geophysical fluid instabilities, approximate dynamical systems, atmospheric general circulation, stratospheric dynamics. Pre: 600 or consent.

MET 606 Cumulus Dynamics (3) Dynamics of convective systems: tornados, waterspouts, squall lines. Interactions with synoptic scale. Pre: 620 or consent. (Alt. years)

MET 607 Mesoscale Meteorology (3) Scale analysis. Observational and theoretical aspects of mesoscale circulation systems. Pre: 600 or consent. (Alt. years)

MET 610 Tropical Climate and Weather (3) Climate and general circulation of the tropics: El Nino and southern oscillation; intraseasonal oscillation; trade winds; tropical weather systems; energy balance; typhoons. Pre: 503 or consent.

MET 616 Monsoon Meteorology (3) Synoptic components of monsoons, regional and temporal variability, numerical models, research exercises. Pre: 610 or consent. (Alt. years)
MET 620 Physical Meteorology (3) Molecular kinetics, atmospheric thermodynamics, cloud physics, precipitation processes, atmospheric electricity, scattering and absorption of solar radiation, absorption and emission of infrared radiation, radiative transfer. Pre: 302 or consent.

MET 621 Cloud Physics (3) Physical processes attending formation and subsequent history of clouds and cloud particles. Pre: 620 or consent. (Alt. years)

MET 631 Statistical Meteorology (3) Probability; frequency distributions of atmospheric variables; linear models; time series analysis (frequency and time domain); principal component analysis; statistical weather forecasting and verification. Pre: MATH 571. (Alt. years)

MET 636 Air Pollution Meteorology (3) (2 Lec, 1 3-hr Lab) Advanced treatment of theoretical diffusion expression (K-theory, Taylor’s statistical hypothesis, similarity theory) and empirical diffusion expressions (Gaussian model with modification and sensitivity analysis, box models). Pre: consent. (Alt. years)

MET 665 Small-Scale Air-Sea Interaction (3) Observations and theory of small-scale processes which couple the atmosphere and ocean boundary layers, including introduction to turbulence theory and parameterization of turbulent fluxes. Pre: MATH 402 and MATH 403 (or their equivalents) and either OCN 620 or MET 600; or consent. (Cross-listed as OCN 665)

MET 699 Directed Research (V) Pre: consent.

MET 700 Thesis Research (V)

MET 745 Mid-latitude Dynamic Meteorology (4) (3 Lec, 1 3-hr Lab) Scale analysis of equations of motion; quasi-geostrophic system of forecasting; initial value problem; general circulation; programming exercise to compute energy interaction terms. Pre: 601 and consent. (Alt. years)

MET 746 Tropical Dynamic Meteorology (4) (3 Lec, 1 3-hr Lab) Instability theory; numerical integration procedures; special problems in numerical analysis in tropics; programming exercises of numerical integration. Pre: 601 and consent. (Alt. years)

MET 752 Special Topics in Meteorology (3) Concentrated studies on selected atmospheric problems. Repeatable. Pre: 600 or consent.

MET 765 (Alpha) Seminar in Meteorology (1) Participation in departmental seminars and presentation of a seminar on: (B) literature review of specific topic; (C) research results. Repeatable. Pre: consent.

MET 800 Dissertation Research (V)

Microbiology (MICR)

College of Natural Sciences

MICR 130 General Microbiology (3) Role of microorganisms; how they affect people, property, and the environment. A basic survey course covering broad aspects of biochemistry, genetics, molecular biology, and physiology; host-parasite relationships, public health, bacterial, mycotic and viral diseases; epidemiology; ecology of soils and water; environmental pollution; food microbiology; industrial applications at an introductory level. Discussion groups optional. Not open to those with credit in 351 or equivalent. NS1

MICR 140 Microbiology Laboratory (2) (2 2-hr Lab) Primarily for students in nursing and dental hygiene. Pre: 130 (or concurrent). NS1

MICR 301 Microbiology Seminar (1) Seminars by the department faculty on current topics. Repeatable once. Pre: 130 or 351 (or concurrent); or consent.

MICR 351 Biology of Microorganisms (3) Anatomy, chemistry, physiology, genetics, development, and environmental interactions of microorganisms. Pre: BIOL 171 or equivalent, CHEM 272, and CHEM 272L; or consent. Co-requisite: 351L. Recommended: MATH 205. NS1

MICR 351L Biology of Microorganisms Lab (2) (2 3-hr Lab) Laboratory exercises to accompany 351. Pre: CHEM 272, CHEM 272L, and BIOL 171, or equivalent.

MICR 431 Microbial Physiology (3) Fundamental physiological and metabolic processes of bacteria; emphasis on growth, functions of cell structures, varieties of energy metabolism, metabolic regulation, and differentiation of microorganisms at the cellular level. Pre: MICR 350 and BIOC 441, or consent.

MICR 431L Microbial Physiology Lab (2) (2 3-hr Lab) Components and metabolism of the bacterial cell; emphasis on techniques of analysis of metabolism and molecular structure. Co-requisite: 431.

MICR 451 Biology of Bacteria (3) Detailed study of physiology, structure, and taxonomy of major groups of bacteria; their growth in nature, laboratory, and industry. Pre: 351.

MICR 451L Biology of Bacteria Lab (2) (2 3-hr Lab) Selected experiments in cultivation, physiology, and taxonomy of major groups. Pre: 351 and 451 (or concurrent).

MICR 461 Immunology (3) Structure and biological actions of antigens and antibodies; fundamentals of antibody synthesis; the relation of immunology to biology and medical sciences. Pre: 351 or BIOL 172; or consent.

MICR 461L Immunology Lab (2) (2 2-hr Lab) Basic exercises and experiments in immunology, immunohematology, immunology to illustrate principles of 461. Co-requisite: 461 or consent.

MICR 463 Microbiology of Pathogens (3) Host-parasite relationships in microbial diseases of man and animals. Pre: 351, 461, and 461L; or consent. Co-requisite: 463L or consent.

MICR 463L Microbiology of Pathogens Lab (2) (2 2-hr Lab) Experiments demonstrating principles of host resistance and immunity. Characterization of bacterial pathogens. Isolation, identification, and diagnosis. Co-requisite: 463 or consent.

MICR 470 Microbial Pathogenesis: Molecular Aspects (3) Fundamental mechanisms of infectious diseases at the molecular level. Emphasis on the role of genetics in host-pathogen interactions. Pre: 351/351L or consent. (Alt. years)

MICR 475 Bacterial Genetics (3) Genetic analysis and molecular basis of transmission replication, mutation, and expression of heritable characteristics in prokaryotes. Pre: 351.

MICR 475L Bacterial Genetics Lab (2) (2 3-hr Lab) Techniques for study of transfer and expression of prokaryotic genes: transformation, conjugation, transposon mutagenesis, preparation and analysis of plasmid and chromosomal DNA. Pre: 475 (or concurrent).

MICR 485 Microbes and Their Environment (3) Distribution, diversity, and roles of microorganisms in terrestrial, freshwater, and marine ecosystems. Importance of bacteria in pesticide degradation, bioremediation of oil spills, sewage treatment, biocontrol, food fermentation. Pre: BIOL 172 and CHEM 272; or consent.

MICR 485L Microbes and Their Environment Lab (2) (2 3-hr Lab) Techniques for study of interaction of microorganisms with and within their natural habitats; symbiosis between microorganisms and plants and animals; role of microorganisms in element cycling; food fermentation by bacteria. Pre: 351 and 485; or consent.

MICR 490 Animal Virology (3) Fundamental concepts; comparison of physical, chemical, and biological properties of representative animal viruses and host-virus relationships at cellular and whole animal level. Pre: 351, 461, BIOC 441, and consent. Co-requisite: 490L.

MICR 490L Animal Virology Lab (2) (2 3-hr Lab) Basic experimental techniques; emphasis on use of animal cell culture systems. Pre: 351, 461, BIOC 441, and consent. Co-requisite: 490L.

MICR 499 Microbiological Problems (V) Directed reading and research. Limited to senior majors with a minimum cumulative GPA of 2.7 or a minimum GPA of 3.0 in microbiology, or consent.

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

MICR 625 Advanced Immunology (3) Detailed reports and discussions on selected advanced topics and current research literature. Pre: 461, BIOC 601, and BIOP 601; or consent. (Alt. years: spring only)

MICR 631 Rhizobium-Legume Symbiosis (1) Rhizobium infection process, nodule formation, genes involved in nodulation and nitrogen fixation and recent advances in rhizobium-legume symbiosis will be discussed as both lectures and student seminars. Pre: 351, 431, 475, or 485. (Spring only)

MICR 632 Advanced Microbial Physiology (3) Selected topics. Pre: 431 or consent. (Alt. years: spring only)

MICR 641 Ultrastructure of Cells (3) Cellular structures, common and specialized, of eukaryotes and prokaryotes; correlating macromolecular structure with cell functions. Pre: BIOL 406 and either BIOC 441 or BIOC 601.

MICR 642 Antibiotics (3) History and applications of antibiotics; antibiotic resistance mechanisms; discovery and approval of new antibiotics; sources of antibiotics; role in nature. Pre: 431, 451, or 463; or consent.

MICR 653 Methods in Microbiology Oceanography (3)

MICR 655 Advanced Virology (3) Detailed reports and discussions on selected advanced topics and current research literature. Pre: 463, 490, either BIOC 441 or BIOC 601, and consent. (Alt. years: fall only)
MICR 661 Regulations of Gene Expressions in Microorganisms (3) Critical discussions of research literature on regulation of gene expression and metabolism in bacterial and fungal systems. Pre: 475, 632, 671, BIOE 601, BIOE 602, and consent. (Alt. years: fall only)

MICR 671 Advanced Microbial Genetics (3) Directed study and discussion of research literature on bacterial and viral virus mutation, genetic recombination, evolution and control mechanisms. Pre: 475, BIOE 601, and consent. (Alt. years: spring only)

MICR 680 Advances in Microbial Ecology (3) Highlights in microbial ecology; interaction of microorganisms with abiotic and biotic components of their environments. Modern techniques for study of autecology and syneiology of microorganisms. Pre: 485 or consent. (Alt. years: spring only)

MICR 681 Host-Parasite Relationships (3) Mechanisms of pathogenicity of microorganisms and defense mechanisms of human and animal hosts. Review of contemporary literature. Pre: 463 or consent. (Alt. years: fall only)

MICR 685 Molecular and Cellular Bacterial Pathogenesis (3) Detailed examination of the molecular and cellular mechanisms of bacterial pathogenesis. Overview of key literature, synthesis of scientific problems into research proposals. Pre: 431, 463, or 470; or consent. (Alt. years: spring only)

MICR 690 Seminar (1) Required of graduate students. Repeatable.

MICR 699 Directed Research (V) Selected problems in microbiology. Pre: consent.

MICR 700 Thesis Research (V) Repeatable.

MICR 795 Special Topics in Microbiology (V) Selected topics in any aspect of microbiology. Repeatable.

MICR 800 Dissertation Research (V) Repeatable.

**MICR 105L Introduction to Military Science Lab (1)** Practical application in adventure training, one-rose bridges, rifle marksmanship, land navigation, drill and ceremonies, physical training. Pre: 105 (or concurrent).

**MICR 106 Introduction to Military Science II (2)** Continuation of 105. Provides instruction in military-related subjects of general student interest, i.e., confidence-building field trips, supervising an individual exercise program, development of individual soldiering skills, and leadership and professional ethics for the military. Introduction to armed forces evolutions. Overview of the Department of Defense, application of force in international relations.

**MICR 106L Introduction to Military Science II Lab (1)** Practical application in adventure training, one-rose bridges, rifle marksmanship, land navigation, drill and ceremonies, physical training. Pre: 106 (or concurrent).

**MSCI 205 Intermediate Military Science I (3)** Basic concepts of military leadership. Familiarization with concept of leadership, the five types of leadership power, the decision-making process, and the styles of leadership. Involves military skills and related adventure-type training and basic individual survival skills. Leadership laboratory required 3.5 hours per week, consisting of practical application of leadership skills, drill and ceremonies, land navigation, first aid, and army physical fitness training.

**MSCI 206 Intermediate Military Science II (3)** Individual and small-unit military skills. Practical applications include combat first aid; basic wilderness survival skills; land navigation; and a knowledge of key military jobs, duties, and responsibilities. Involves field training to provide hands-on experience. Leadership laboratory required 1.5 hours per week, consisting of practical application of leadership skills, drill and ceremonies, land navigation, first aid, and army physical fitness training.

**MSCI 207 ROTC Basic Camp (6)** Six-week summer course conducted at Ft. Knox, Kentucky. Substitutes for ROTC basic course (105, 106, 205, and 206) and fulfills course requirement for admission to ROTC advanced courses. Credit will be given for 207 or basic courses, but not both. Pre: consent.

**MSCI 305 Leading Small Organizations I (4) (2.5 Lec, 1.5-hr Lab)** Series of practical opportunities to lead small groups and receive personal assessments and encouragement. Uses small unit defensive tactics and opportunities to plan/conduct training. Includes field training sessions, student taught classes, and presentations/briefings. Co-requisite: 101. Pre: 105, 106, 205, and 206; or consent.

**MSCI 306 Leading Small Organizations II (4) (2.5 Lec, 1.5-hr Lab)** Analyze tasks and prepare written or oral guidance for team members to accomplish tasks. Delegate tasks and supervise. Examine and apply lessons from leadership case studies. Examine importance of ethical decision-making. Includes field training sessions, student taught classes and presentations/briefings. Co-requisite: 101. Pre: 105, 106, 205, 206, and 305; or 305 and consent.


**MSCI 399 Directed Reading and Research (V)** Limited to military science students who have had at least one previous military science course for which a grade of B or higher was earned and a cumulative GPA of 2.0 or better. Pre: consent.

**MSCI 405 Leadership Challenges and Goal Setting (4) (2.5 Lec, 1.5-hr Lab)** Plan, conduct and evaluate activities of the ROTC cadet organization. Assess organizational cohesion and develop strategies to improve it. Develop confidence in skills to lead people and manage resources. Includes field training sessions, student taught classes and presentations/briefings. Co-requisite: 101. Pre: 105, 106, 205, 206, 305, and 306; or 305, 306, and consent.

**MSCI 406 Transition to Lieutenant (4) (2.5 Lec, 1.5-hr Lab)** Continues the methodology from 405. Identify and resolve ethical dilemmas. Refine counseling and motivating techniques. Examine aspects of tradition and law as related to leading as an officer in the Army. Prepare for a future as a successful Army officer. Includes field training sessions, student taught classes and presentations/briefings. Co-requisite: 101. Pre: 105, 106, 205, 206, 305, 306, and 405; or 305, 306, 405, and consent.

**Music (MUS)**

College of Arts and Humanities

Applied music courses appear at the end of this section.

**MUS 106 Introduction to Music Literature (3)** Elements, styles, and forms of music, from listener’s standpoint. AH1

**MUS 107 Music in World Cultures (3)** Folk, popular, and art music from major regions of the world, with emphasis upon Asia and the Pacific; representative styles and regional characteristics. AH1

**MUS 108 Fundamentals of Western Music (3)** Fundamental concepts in organization of music as expressive medium in Western culture. Roles of composer, performer, and listener. Notation as mode of communication. Discovery and verification of ideas through laboratory experience. AH1

**MUS 114 University Chorus (1)** Performance of choral literature from Renaissance to present. Previous choral experience not required. Repeatable. AH1

**MUS 121 (Alpha) Class Instruction I (1)** Basic principles of performance; relevant problems in literature. (B) voice; (C) piano; (D) guitar; (E) guitar: pop/folk. Repeatable in different sections. Cannot be audited. AH1

**MUS 122 (Alpha) Class Instruction II (1)** Basic principles of performance; relevant problems in literature. (B) voice; (C) piano; (D) guitar; (E) guitar: pop/folk. Repeatable in different sections. Cannot be audited. Pre: 121 or consent. AH1

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For key to symbols and abbreviations, see the first page of this section.