

**ETEC 667 Tech in Nontech Disciplines I (3)** Designed for non-tech disciplines, course focuses on building and facilitating student success in selected computer, distance learning, Web, and Internet technologies through the exploration, understanding, application, and integration of key concepts and skills. Not for ETEC majors. A-F only. Pre: 442 or consent.

**ETEC 668 Tech in Nontech Disciplines II (3)** Designed for non-tech disciplines, course builds upon the concepts and skills learned in ETEC 667 by presenting, for mastery, more complex technological concepts and skills involved in the design and creation of information on the Web. Not for ETEC majors. A-F only. Pre: 667.

**ETEC 670 Media and Technological Product Evaluation (3)** Evaluation process, sources and instruments applicable to systematic appraisal of technology systems, hardware, software, and other instructional resources. Repeatable two times. A-F only. Pre: consent.

**ETEC 679 Education and Communication Technologies (3)** Role and impact of communication technologies in contemporary educational institutions. Application and adaptation of such technologies to instructional (i.e., teaching as well as learning) activities and ramifications of these technologies on administrative structure of schools. A-F only.

**ETEC 680 Professional Ethics and Media (3)** Examining and conveying an ethical vision of the role and impact of communication technologies in contemporary education and training situations; communicating that vision by designing technology-based displays using newer technologies. A-F only.

**ETEC 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 LIS 686)

**ETEC 687 Instructional Development Practicum (3)** Practicum in instructional development and design in academic, agency, and private industry settings, under close supervision, plus regular class meetings in seminar format. Pre: consent.

**ETEC 688 Educational Technology Practicum (3)** Practicum in educational technology applications in academic or non-academic settings, under close supervision, plus regular class meetings. Pre: consent.

**ETEC 690 Seminar and Internship in Technology Leadership (3)** Supervised activity in application of technology to teaching/training experiences. Repeatable. Pre: ETEC major and consent.

**ETEC 699 Directed Reading and/or Research (V)** Individual reading and/or research. Repeatable for 3 credit hours maximum each time. Pre: consent of department chair.

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

**ETEC 750 (Alpha) Seminar in Educational Technology Issues (3)** Study and discussion of significant topics and problems. (B) instructional development (Pre: 603 and consent); (C) telecommunications (Pre: consent); (D) the future (Pre: consent).

**ETEC 699 Directed Reading and/or Research (V)** Individual reading and/or research. Repeatable for 3 credit hours maximum each time. Pre: consent of department chair.

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

**ETEC 750 (Alpha) Seminar in Educational Technology Issues (3)** Study and discussion of significant topics and problems. (B) instructional development (Pre: 603 and consent); (C) telecommunications (Pre: consent); (D) the future (Pre: consent).

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## Electrical Engineering (EE)

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### College of Engineering

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

**EE 101 Electrical Engineering Skills (3)** Electrical engineering subjects in a skill acquisition context at the freshman level. Learning, creative problem solving, brainstorming, technical information assimilation, and presentation skills development. Repeatable. **DP**

**EE 160 Programming for Engineers (4)** (3 Lec, 1 3-hr Lab) Introductory course on computer programming and modern computing environments with an emphasis on algorithm and program design, implementation, and debugging. Includes a hands-on laboratory to develop and practice programming skills. Restricted to engineering freshmen and sophomores. A-F only. Pre: Math 140 or equivalent or consent.

**EE 196 Freshmen Project (V)** Freshman level individual or team project under EE faculty direction and guidance. This project provides early student entry into EE hands-on project activity providing practical skills, EE subject exposure and experience. Second semester freshman standing required. Repeatable. Pre: consent.

**EE 211 Basic Circuit Analysis I (4)** (3 Lec, 1 3-hr Lab) Linear passive circuits, time domain analysis, transient and steady-state responses, phasors, impedance and admittance; power and energy, frequency responses, resonance. Pre: MATH 243 (or concurrent) and PHYS 272 (or concurrent), or consent. **DP**

**EE 213 Basic Circuit Analysis II (4)** (3 Lec, 1 3-hr Lab) Laplace transforms and their application to circuits, Fourier transforms and their applications to circuits, frequency selective circuits, introduction to and design of active filters, convolution, and state space analysis of circuits. A-F only. Pre: 211 or consent. Co-requisite: MATH 244. **DP**

**EE 260 Introduction to Digital Design (4)** (3 Lec, 1 3-hr Lab) Introduction to the design of digital systems with an emphasis on design methods and the implementation and use of fundamental digital components. Pre: 160 or consent.

**EE 296 Sophomore Project (V)** Sophomore level individual or team project under EE faculty direction and guidance. The project provides design experience and develops practical skills. Repeatable. Pre: sophomore standing or consent.

*Registration in upper division courses will be contingent upon earning a grade of C or better in prerequisite courses.*

**EE 315 Signal and Systems Analysis (3)** Discrete Fourier transform, Fourier series, Fourier transform, Laplace transform. Fast Fourier transform, analysis of linear systems. Pre: 213 and MATH 244 or MATH 253A, or consent.

**EE 323 Microelectronic Circuits I (3)** Semiconductor structures, operating principles and characteristics of diodes and amplifying devices. Their application as circuit elements in building basic digital, analog, and integrated circuit subsystems. Pre: 213 and 324. **DP**

**EE 323L Microelectronic Circuits I Lab (1)** (1 3-hr Lab) Experiments on linear and logic properties of diodes and transistor networks. Pre: 213. Co-requisite: 323. **DY**

**EE 324 Physical Electronics (3)** Review of quantum mechanics fundamentals, H-atom, and chemical bonding. Introduction to band structure models and materials. Semiconductor doping, charge carrier statistics and charge transport, including ambipolar transport. Metal-semiconductor and PN junctions. Pre: MATH 243 or MATH 253A, and PHYS 274; or consent. **DP**

**EE 326 Microelectronic Circuits II (3)** Principles and design of linear electronic circuits including differential, operational, feedback, and tuned amplifiers; integrated circuits, current mirrors, signal generators, filters, and stability. Pre: 323. **DP**

**EE 326L Microelectronic Circuits II Lab (1)** (1 3-hr Lab) Laboratory for 326, experiments on linear and analog electronics. Pre: 323L. Co-requisite: 326. **DY**

**EE 327 Theory and Design of IC Devices (3)** Band structure models and carrier transport physics review. Theory and design of semiconductor IC devices: Schottky diodes, bipolar devices (PN junction diodes, BJTs), FETs (MOSFETs, JFETs, and MESFETs). Pre: 324 and MATH 243 or MATH 253A; or consent. **DP**

**EE 328 Physical Electronics Lab Techniques (3)** Technology principles and methods for the design and fabrication of integrated circuit devices. Pre: 327. **DP**

**EE 328L Physical Electronics Lab (1)** (1 3-hr Lab) Hands-on laboratory where students make various electronic devices using IC technology. Devices are also tested and analyzed. Pre: 327. Co-requisite: 328. **DY**

**EE 341 Introduction to Communication Systems (3)** Signal representation, Fourier analysis; amplitude and angle modulated systems; sampling theorems, pulse and digital modulation systems; carrier modulation by digital signals. Pre: 315.

**EE 341L Communication Systems Lab (1)** (1 3-hr Lab) Experiments illustrating the basic principles of communication systems. Pre: 315. Co-requisite: 341.

**EE 342 EE Probability and Statistics (3)** Probability, statistics, random variables, distributions, densities, expectations, limit theorems, and applications to electrical engineering. Pre: 315 (or concurrent) and MATH 244 or MATH 253A, or consent.

**EE 344 Networking I (4)** (3 Lec, 1 3-hr Lab) Covers 4 semesters from the Cisco Networking Academy plus supplementary material; hands-on experience with routers and switches; prepares students for the CCNA. Topics include TCP/IP, LANs, WANs, routing protocols, network security; PPP; ISDN, frame relay. A-F only. Pre: 160 or consent.

**EE 351 Linear Feedback-Control Systems (3)** Analysis/design of feedback systems. Compensator design via root locus and Bode analysis. Routh/Nyquist stability. State space representation and introduction to MIMO formulation. Controllability/observability. Application to physical dynamic systems such as industrial robots. Pre: 315 or ME 375 or consent. Co-requisite: 351L. (Cross-listed as ME 351) **DP**

**EE 351L Linear Feedback-Control Systems Lab (1)** (1 3-hr Lab) Provides experience in applying theoretical tools to analyze linear systems. Extensive use is made of computer-aided analysis and design packages study system performance. Pre: 315. Co-requisite: 351.

**EE 361 Digital Systems and Computer Design (3)** Design methodology, processor design, control design, memory organization, system organization. Pre: 213 and 260; or consent.

**EE 361L Digital Systems and Computer Design Lab (1)** (1 3-hr Lab) Laboratory for 361, experiments on digital systems and interfacing. Co-requisite: 361.

**EE 366 CMOS VLSI Design (4)** (3 Lec, 1 3-hr Lab) Introduction to the design of very large scale integrated (VLSI) systems and use of CAD tools and design languages. Lab includes hands-on use of CAD tools and experiments with field programmable logic devices. Pre: 260.

**EE 367 Computer Data Structures and Algorithms (3)** Introduction to computer programming algorithms with emphasis on advanced data structures, input-output routines, files, and interpreters. Pre: 160.

**EE 367L Computer Data Structures and Algorithms Lab (1)** (1 3-hr Lab) Laboratory for 367. Pre: 367.

**EE 371 Engineering Electromagnetics I (3)** Transient and steady-state waves on transmission lines. Plane wave solutions of Maxwell's equations. Application of Maxwell's equations under static and time-varying conditions. Pre: 213.

**EE 372 Engineering Electromagnetics II (3)** Solution of Maxwell's equations under various boundary conditions. Introduction to radiation, guided waves, and principles of optics. Pre: 371 and PHYS 274 (or concurrent); or consent.

**EE 372L Engineering Electromagnetics Lab (1)** (1 3-hr Lab) Experiments illustrating the basic principles of electromagnetics and optics. Pre: 371 and PHYS 274 (or concurrent); or consent. Co-requisite: 372.

**EE 396 Junior Project (V)** Junior level individual or team project under EE faculty direction and guidance. The project provides design experience and develops practical skills. It may be a continuation of EE 296 or a new project. Repeatable. Pre: 296, junior standing or consent.

**EE 415 Digital Signal Processing (4)** (3 Lec, 1 3-hr Lab) Discrete-time signals and systems,

sampling, Z-transform, transform, transform analysis of linear time-invariant systems, filter design, discrete Fourier transform, and computation of discrete Fourier transform. Repeatable one time. Pre: 315 and 342 (or concurrent); or consent.

**EE 422 Electronic Instrumentation (3)** Electronic circuits for interfacing with transducers, signal processing, and data acquisition. Amplifiers for measurement and control. Operational amplifiers in linear, nonlinear, and digital applications. Design project. Basic transducers. Pre: 326, 326L, and 371; or consent. **DP**

**EE 422L Instrumentation Lab (1)** (1 3-hr Lab) Laboratory for 422. Co-requisite: 422. **DY**

**EE 423 Computer-Aided Analysis and Design (3)** Algorithms and techniques used in computer-aided analysis and design of electronic circuits. Circuit simulation with interactive computers. Pre: 326 or consent.

**EE 425 Electronic Instrumentation II (3)** Instrumentation systems and circuits for measurement, control, signal processing, transmission, and detection. Noise and interference, ADC/DAC, modulation/demodulation, high-frequency and high-speed techniques, IC applications. Pre: 422 and 422L, or consent. **DP**

**EE 426 Advanced Si IC and Solid State Devices (3)** State of the art Si-based devices including advanced bipolar and MOS devices, heterojunction devices, new device trends. Topics from the most current literature included. Pre: 327 and MATH 243 or MATH 253A; or consent. **DP**

**EE 427 Computer-Aided Circuit Design (3)** Application of the computer to the analysis, design, simulation, and construction of analog and digital circuits. Pre: 326 and 326L, or consent. **DP**

**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 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. **DP**

**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 467 Object-oriented Software Engineering (3)** Introduction to 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 469 Wireless Data Networks (3)** Mobile agent's platforms and systems, mobile agent-based service implementation, middleware, and configuration, wireless local area networks, wireless protocols, network architecture supporting wireless applications, routing protocols in mobile and wireless networks, handoff in mobile and wireless networks. Pre: 344 and 367; or consent.

**EE 470 Physical Optics (3)** Fundamentals of classical physical optics emphasizing linear systems theory, including optical fields in matter, polarization phenomena, temporal coherence, interference and diffraction (Fourier optics). Specialized applications include Gaussian beams, laser resonators, pulse propagation, and nonlinear optics. Pre: 371 and 315 (or concurrent), or PHYS 350 and PHYS 400 (or concurrent), or consent. **DP** (Cross-listed as PHYS 460)

**EE 473 Microwave Engineering (3)** Passive and active microwave devices and circuits for RF and wireless applications. Scattering parameters, signal-flow graphs, and computer-aided design. Pre: 371. **DP**

**EE 474 Antennas (3)** Electromagnetic wave propagation in free space and ionized media. Geomagnetic and solar effects on the ionosphere. Absorption and dispersion. Antenna arrays, apertures, horns, impedance. Design of antenna systems. Pre: 371. **DP**

**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. A-F only. Pre: 341 (or concurrent) and 372; or consent. **DP**

- EE 477 Fundamentals of Radar, Sonar, and Navigation Systems (3)** Discussion of basic radar detection and position- and velocity-measurement principles. Applications to various types of radar and sonar systems. Modern navigation aids. Pre: 371 or equivalent, and familiarity with waveguides or waveguide theory. **DP**
- 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 244 or MATH 253A.
- EE 480L Biomedical Engineering Lab (1)** (1 3-hr Lab) Measurement of bioelectrical signals, computer and electronic simulation of biological systems, design and evaluation of electronic circuits for biomedical measurements, evaluation of instruments for patient safety. Pre: 323 and 323L. Co-requisite: 480.
- EE 481 Bioelectric Phenomena (3)** Study of electrical phenomena in living systems. Mechanisms underlying bioelectric activity. Membrane and transepithelial potentials, skin impedance, electrocardiography, neuroelectric signals, diagnostic considerations, laboratory demonstrations. Pre: 480 or consent.
- 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 Capstone Design Project (V)** A significant project that integrates the design content of previous courses and satisfies realistic constraints involving reliability, safety, and economics, as well as aesthetic, ethical and societal aspects of the problem. A-F only. Pre: 396 or consent.
- 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 Intelligent Autonomous Agents (3)** The theory, methods and practical applications of autonomous agent systems, including common applications of both software and hardware (robotic) agents. In-depth practical experience with autonomous agents through programming assignments and projects. Pre: 467 or ICS 313 (or equivalent), graduate standing. (Cross-listed as ICS 606)
- EE 607 Advanced Network Algorithms (3)** Network algorithms, protocols, and packet switching systems for the internet including TCP/IP, routing algorithms, transmission scheduling, link management, buffer management, and simple network management. Pre: 367 or consent.
- EE 608 Optical Networks (3)** Propagation of signals in fibers, components, modulation and demodulation, transmission system engineering, network systems and architectures, network design, control and management and packet switching. Pre: 342, 367, and 371; or consent.
- 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 nonmajors for CR/NC only. Pre: 415 or 640 or consent.
- EE 616 Digital Image Processing (3)** Human visual perception, image formation, sampling and quantization, enhancement and restoration, color image processing, wavelets and multiresolution representations, image and video compression. Pre: 415 or equivalent.
- EE 618 Optimization Theory and Practice (3)** Dynamic programming, nonlinear optimization, optimal control. Pre: 650.
- EE 620 Advanced Electronic Circuits (3)** Electronic circuits for precision measurement, computation, and signal processing. Low noise and interference reduction techniques. High-frequency and high-speed techniques. Microprocessor and biomedical applications. Pre: 422.
- 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)** Fundamentals of optical radiation, including stimulated and spontaneous processes. Optical electronics including optical resonators, lasers, optical detectors, light-guiding, 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 Microsensors 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 microtransducers. Pre: 327 or consent.
- EE 625 High-Frequency Solid-State Devices (3)** High-frequency semiconductor devices. Hot electrons, Gunn oscillators, IMPATT diodes, mesfets, modfets, micromechanical klystrons, TWTS, magnetrons, resonant tunneling devices, superlattice devices. 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 (3)** Fabrication constraints and design guidelines for integrated circuits. Nonlinear model of integrated circuit transistor. Design and analysis of integrated logic circuits and linear circuits. Pre: 323.
- 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: 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 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 Queueing 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 (3)**

Pattern recognition, neural networks, and machine learning. Discriminant functions, super-vised and unsupervised learning, associative memories, feed forward and recurrent networks, learning complexity, computational learning theory and applications. Pre: 640.

**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, coded modulation, multistage decoding, concatenated coded modulation, probabilistic decoding, turbo codes, low density parity check codes and iterative decoding. 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 (3)**

Digital simulations, phase-plane analysis, limit cycles and amplitude bounds, Lyapunov's theorem, circle criterion of stability, lure systems, Popov's stability theorem. Pre: 650.

**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 (3)** Models of computation, high-performance processors, pipelined machines, RISC processors, VLIW, superscalar and fine-grain parallel machines. Data-flow architectures. Hardware/software tradeoffs. Pre: 461.

**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 communica-

tion, 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)**

Solutions of Maxwell's equations and applications to radiation and propagation of electromagnetic waves. Pre: 372 or consent.

**EE 673 Advanced Microwave Engineering (3)**

Advanced RF and microwave circuit design for wireless applications. Pre: 473 or consent.

**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 371; 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: consent.

**EE 699 Directed Reading or Research (V)**

CR/NC only. Pre: graduate standing and consent.

**EE 700 Thesis Research (V)** Research for master's thesis. Pre: candidacy for MS in electrical engineering.

**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.

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## Engineering (ENGR)

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*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 one time. CR/NC only. Open to College of Engineering learning community students only. Co-requisite: EE 160, MATH 242, and PHYS 170.

**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. (Cross-listed as IS 250)

**ENGR 350 Career Development Seminar (1)**

Introduction to career development as it pertains to engineering and business industry; client relations, networking, job skills, career assessment and direction. Repeatable one time. Fall only.

**ENGR 401 Engineering Management (3)**

Introduction to engineering management with emphasis on development of skills for professional advancement. Repeatable one time.

**ENGR 493 Field Experience (1)**

Supervised internship in engineering practice under professional and faculty direction. Repeatable one time. CR/NC only. Pre: junior standing in engineering and consent.

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## English (ENG)

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*College of Languages, Linguistics and Literature*

**ENG 100 Composition I (3)** Introduction to the rhetorical, conceptual and stylistic demands of writing at the university level; instruction in composing process, search strategies, and writing from sources. Pre: placement exam or consent. **FW**

**ENG 101 Composition I (3)** Introduction to the rhetorical, conceptual, and stylistic demands of writing at the university level; instruction in composing process, search strategies, and writing from sources. Requires supplemental tutorial laboratory. A-F only. Pre: placement exam. Co-requisite: 101L. **FW**

**ENG 101L Composition I Writing Laboratory (1)** Intensive individual instruction in writing at the university level. CR/NC only. Pre: placement exam. Co-requisite: 101. **FW**

*ENG 200 and 209 are courses in intermediate expository writing.*

**ENG 200 Composition II (3)** Further study of rhetorical, conceptual, and stylistic demands of writing; instruction develops the writing and research skills covered in Composition I. Pre: 100. **DL**

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

*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 works from beginnings to present. Requires a minimum of 3,000 words of writing. Pre: 100, 100A, 101/101L or ELI 100. **DL**

**ENG 251 British Literature to 1800 (3)** Major works from Medieval, Renaissance, and Neoclassical periods. Requires a minimum of 3,000 words of writing. Pre: 100, 100A, 101/101L or ELI 100. **DL**

**ENG 252 British Literature after 1800 (3)** Major works from the Romantic, Victorian, modern, and contemporary periods. Requires a minimum of 3,000 words of writing. Pre: 100, 100A, 101/101L or ELI 100. **DL**

**ENG 253 World Literature to 1600 (3)** World literature (Africa, the Americas, Asia, Europe, Oceania) to 1600. Requires a minimum of 3,000 words of writing. Pre: 100, 100A, 101/101L or ELI 100 or consent. **DL**

**ENG 254 World Literature after 1600 (3)** World literature (Africa, the Americas, Asia, Europe, Oceania) after 1600. Requires a minimum of 3,000 words of writing. Pre: 100, 100A, 101/101L or ELI 100 or consent. **DL**

**ENG 255 Short Story and Novel (3)** Introduction to prose fiction through major works. Requires a minimum of 3,000 words of writing. Pre: 100, 100A, 101/101L or ELI 100. **DL**

**ENG 256 Poetry and Drama (3)** Introduction to poetry and drama through major works. Requires a minimum of 3,000 words of writing. Pre: 100, 100A, 101/101L or ELI 100. **DL**

**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 one time. Pre: 100, 100A, 101/101L or ELI 100. (257S cross-listed as MAO 261) (257Y cross-listed as WS 257) **DL**

**ENG 300 The Rhetorical Tradition (3)** History of theory and practices of rhetoric from Classical to contemporary periods; e.g., Plato, Aristotle, Cicero, Quintilian, Augustine, Sidney, K. Burke, DeMan. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 302 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. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 306 Argumentative Writing I (3)** Theory and practice of written argument; emphasis on the role of invention in argumentative discourse and on the nature of rhetorical proof. Pre: grade of C or better in ENG 100 or ENG 200; or consent. **DL**

**ENG 307 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: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 308 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, 100A, 101/101L or ELI 100. **DL**

**ENG 311 Autobiographical Writing (3)** Writing clear, effective prose based on the writer's own experiences and ideas. Pre: one of the following: 250, 251, 252, 253, 254, 255, 256, 257. **DL**

**ENG 313 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 the following: 250, 251, 252, 253, 254, 255, 256, 257. **DA**

*Fulfillment of the college's written communication requirement and two semesters of 250–257 (second may be taken concurrently) 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 English Studies (3)** Introduction to the purpose, practice, and potential of literary and rhetorical study of texts. Prerequisite to 400-level work for English majors. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 321 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. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 322 The Bible as Literature (3)** Narrative, generic, and stylistic forms in the Bible in English. Related writings may be considered in comparative analysis. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 323 Literature in English to 1660 (3)** Basic concepts and representative texts for the study of literature in English to 1600. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 324 Literature in English 1660-1900 (3)** Basic concepts and representative texts for the study of literature in English from 1660-1900. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 325 Literature in English after 1900 (3)** Basic concepts and representative texts for the study of literature in English after 1900. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 326 Literature and Colonialism (3)** Basic concepts and representative texts for the study of colonial, post-colonial, and commonwealth literatures from regions such as Africa, India, the Pacific, and the Caribbean. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 327 Literary Criticism and Theory (3)** Survey of representative texts from Greek to

modern times; e.g., Plato, Aristotle, Sidney, Johnson, Arnold, Eliot, Barthes, Derrida, Foucault, Kristeva. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 330 Medieval British Literature (3)** Basic concepts and representative texts for the study of British literature before 1500. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 331 Renaissance British Literature (3)** Basic concepts and representative texts for the study of British prose and poetry from 1500 to 1660. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 332 Restoration/18th-Century British Literature (3)** Basic concepts and representative texts for the study of British prose, poetry, and drama from 1660 to 1780, exclusive of Milton. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 333 Romantic British Literature (3)** Basic concepts and representative texts for the study of British prose and poetry from 1780 to 1832. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 334 Victorian British Literature (3)** Basic concepts and representative texts for the study of British prose and poetry from 1832 to 1900. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 335 British Literature after 1900 (3)** Basic concepts and representative texts for the study of British prose, poetry, and drama from 1900 to the present. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 336 American Literature to Mid-19th Century (3)** Basic concepts and representative texts for the study of prose, poetry, and drama in American literature through the middle of the 19th century. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 337 American Literature Mid-19th to Mid-20th Century (3)** Basic concepts and representative texts for the study of prose, poetry and drama in American literature from the middle of the 19th century to the middle of the 20th century. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 338 American Literature since Mid-20th Century (3)** Basic concepts and representative texts for the study of American literature since approximately 1950. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 350 18th-Century Novel in English (3)** Basic concepts and representative texts for the study of the novel in English before 1800. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 351 19th-Century Novel in English (3)** Basic concepts and representative texts for the study of the novel in English between 1800 and 1900. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 352 20th-Century Novel in English (3)** Basic concepts and representative texts for the study of the novel in English after 1900. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 353 History of Poetic Forms (3)** Basic concepts and representative texts for the historically organized study of poetic genres and forms before the 20th century and primarily in English. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 354 Poetry in English after 1900 (3)** Basic concepts and representative texts for the study of poetry in English after 1900. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 355 Drama in English to 1900 (3)** Basic concepts and representative texts for the study of drama in English from the Middle Ages through the end of the 19th century. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 356 Drama in English after 1900 (3)** Basic concepts and representative texts for the study of drama in English after 1900. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 360 Prose Fiction (3)** Basic concepts and representative texts for the study of the form, function, and development of prose fiction genres such as short story and novel. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 361 Poetry (3)** Basic concepts and representative texts for the analysis of imagery, sound, language, form, and structure in poems. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 362 Drama (3)** Basic concepts and representative texts for the study of the form, function, and development of the genre of drama. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 363 Film (3)** Basic concepts and representative texts for the study of the form, function, and development of cinematic narrative techniques. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DH**

**ENG 364 Non-fiction Prose (3)** Basic concepts and representative texts for the study of non-fiction prose such as essays, biographies, autobiographies, speeches, political and legal documents, conversion and captivity narratives, testimonials, science writing, and travel writing. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 365 Mixed Genres (3)** Basic concepts and representative texts for the study of works that incorporate more than one genre. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 366 Shakespeare and Film (3)** Comparative analysis of selected plays by Shakespeare and films which appropriate, reenact, adapt, or offer variations on his texts. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. Once a year. **DL**

**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: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. (Cross-listed as ES 370) **DL**

**ENG 371 Literature of the Pacific (3)** Basic concepts and representative texts for the study of the literature of the Pacific, including Pacific voyagers and contemporary writings in English by Pacific Islanders. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. (Cross-listed as PACS 371) **DL**

**ENG 372 Asian American Literature (3)** Basic concepts and representative texts for the study of Asian American literature by writers from a variety of backgrounds. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. (Cross-listed as ES 372) **DL**

**ENG 373 African American Literature (3)** Basic concepts and representative texts for the study of African American literature by writers from a variety of backgrounds. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 374 Race, Ethnicity, and Literature (3)** Basic concepts and representative texts for the study of race and ethnicity as the basis for literary inquiry. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 375 Philippine Contemporary Literature in English (3)** Critical survey of 20th-century Philippine literature written in English; cultural values. Pre: one of ENG 250-257 or consent. (Cross-listed as IP 363) **DL**

**ENG 376 Philippine Literature and Folklore in Translation (3)** Philippine folk literature translated into English: epics, myths, legends, and other folklore. Classic works of vernacular writers. Pre: one of ENG 250-257 or consent. (Cross-listed as IP 396) **DL**

**ENG 380 Folklore and Oral Tradition (3)** Basic concepts and representative texts for the study of folktales, legends, ballads and other folklore genres in various cultures; consideration given to folklore/literature relationships. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 381 Popular Literature (3)** Basic concepts and representative texts for the study of popular literature genres, such as detective

fiction, science fiction, the thriller, the romance, and westerns. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 382 Gender, Sexuality and Literature (3)** Basic concepts and representative texts for the study of literary constructions of gender and sexuality. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. (Cross listed as WS 381) **DL**

**ENG 383 Children's Literature (3)** Basic concepts and representative texts for the study of children's literature; may include study of children's book illustration. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 384 Literature and Technology (3)** Basic concepts and representative texts for the study of literature in relation to technological developments. May include history of the book, impact of printing and computer networks, science fiction. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 393 Junior Honors Tutorial (3)** Tutorials in Literature. Consult the English Department's Honors Director for particulars; offered Fall semester. Repeatable one time. Pre: enrollment in Honors Program and two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

**ENG 394 Junior Honors Tutorial (3)** Tutorials in Literature. Consult the English Department's Honors Director for particulars; offered Spring semester. Repeatable one time. Pre: enrollment in Honors Program and two of the following: 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. **DL**

*The specific content of 400-level Studies courses varies by semester. Students should obtain the English department's fall and spring course descriptions prior to enrolling. Descriptions are available in KUY 402 and 429 and on the department's webpage ([www.english.hawaii.edu](http://www.english.hawaii.edu)) a week or so before the SOC comes out. All Studies courses require a significant research component.*

**ENG 402 History of the English Language (3)** Origin and evolution of English language to c.1800, particularly as manifested in literary texts. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; or consent. **DH**

**ENG 403 Modern English Grammar (3)** Structure of contemporary English; current theories of grammar; relation between grammar and style. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; or consent. **DH**

**ENG 404 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 present. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; or consent. **DH**

**ENG 405 Teaching Composition (3)** Theory, observation, and practice in teaching writing,

especially the use of one-on-one and small group instruction. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; or consent. Recommended: 306. **DL**

**ENG 406 Argumentative Writing II (3)** Extended study of both the philosophical and practical dimensions of written reasoning. Emphasis on argument as a process of inquiry. Pre: 306 or consent. **DL**

**ENG 407 Writing for Electronic Media (3)** Combined lecture/lab course on writing and rhetoric in computer-mediated communication. May include online technical writing, courseware development, hypertext fiction. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; and 307; or consent. **DL**

**ENG 408 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: 306, 311, 313, 403, or 405; or consent. **DL**

**ENG 409 Studies in Composition/Rhetoric/Language (3)** Intensive study of selected topics, problems, themes, issues, and/or writers in composition, rhetoric, and/or English language. Repeatable one time. Pre: 320 and one other 300-level ENG course; or consent. **DL**

**ENG 410 Form and Theory of Poetry (3)** Poetic theories and techniques for students interested in writing poetry. Pre: 313 or consent. **DL**

**ENG 411 Poetry Workshop (3)** Writing, evaluating poems. Repeatable one time. Pre: 410 or consent. **DA**

**ENG 412 Nonfiction Writing (3)** Workshop analysis of nonfiction as a literary form. Repeatable one time. Pre: 306 or 313; or consent. **DL**

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

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

**ENG 415 Prosody (3)** Reading and writing in traditional poetic forms—sonnet, villanelle, sestina, roundel, pantoum, etc.—for theoretical and practical appreciation of formal poetry. Pre: 361 or 410; or consent. **DL**

**ENG 416 Studies in Creative Writing (3)** Intensive study of selected topics, problems, themes, writers, or modes of creative writing in a workshop setting. Repeatable one time. Pre: 313; 410, 412, or 413; or consent. **DL**

**ENG 420 Studies in Literature and Culture (3)** Intensive study of selected problems, issues, writers, traditions, or movements in regard to cultural studies and the reading and interpretation of cultural texts. Repeatable one time. Pre: 320 and one other 300-level ENG course; or consent. **DL**

**ENG 421 Studies in Comparative Literature (3)** Intensive study of selected problems, issues, writers, traditions, or movements in the field of comparative literature. Repeatable one time. Pre: 320 and one other 300-level ENG course; or consent. **DL**

**ENG 427 Studies in Literary Criticism and Theory (3)** Intensive study of selected problems, issues, writers, traditions, or

movements in the field of literary criticism and critical theory. Repeatable one time. Pre: 320 and one other 300-level ENG course; or consent. **DL**

**ENG 430 Studies in Medieval Literature (3)** Intensive study of selected problems, issues, writers, traditions, or movements in Old/Middle English literature from 500-1500, including works in modern translation. Repeatable one time. Pre: 320 and one other 300-level ENG course; or consent. **DL**

**ENG 431 Studies in 16th and 17th Century Literature (3)** Intensive study of selected problems, issues, writers, traditions, or movements in texts written during the period 1500-1700. Repeatable one time. Pre: 320 and one other 300-level ENG course; or consent. **DL**

**ENG 432 Studies in 18th Century Literature (3)** Intensive study of selected problems, issues, writers, traditions, or movements in texts written during the period 1660-1830, the “long” 18th century. Repeatable one time. Pre: 320 and one other 300-level ENG course; or consent. **DL**

**ENG 433 Studies in 19th Century Literature (3)** Intensive study of selected problems, issues, writers, traditions, or movements in texts written during the 19th century. Repeatable one time. Pre: 320 and one other 300-level ENG course; or consent. **DL**

**ENG 434 Studies from 20th Century to Present (3)** Intensive study of selected problems, issues, writers, traditions, or movements in texts written from the 20th century to the present. Repeatable one time. Pre: 320 and one other 300-level ENG course; or consent. **DL**

**ENG 440 (Alpha) Single Author (3)** Intensive study of the works and literary milieu of a single author: (B) Emily Dickinson; (C) George Eliot; (D) William Faulkner; (E) Ben Jonson; (F) James Joyce; (G) Mark Twain; (H) Walt Whitman; (I) Virginia Woolf; (J) William Wordsworth; (K) Charles Dickens; (M) Toni Morrison; (N) Jane Austen. Repeatable one time (different alpha letter). Pre: any two of the following: 250, 251, 252, 253, 254, 256, 257; or consent. **DL**

**ENG 442 Geoffrey Chaucer (3)** Intensive study of the works and literary milieu of Geoffrey Chaucer. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; or consent. **DL**

**ENG 445 William Shakespeare (3)** Intensive study of the works and literary milieu of William Shakespeare. Repeatable one time. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; or consent. **DL**

**ENG 447 John Milton (3)** Intensive study of the works and literary milieu of John Milton. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; or consent. **DL**

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

**ENG 460 Studies in Fiction (3)** Intensive study of selected problems, issues, writers,

traditions, or movements in prose fiction. Repeatable one time. Pre: 320 and one other 300-level ENG course; or consent. **DL**

**ENG 461 Studies in Poetry (3)** Intensive study of selected problems, issues, writers, traditions, or movements in poetry. Repeatable one time. Pre: 320 and one other 300-level ENG course; or consent. **DL**

**ENG 462 Studies in Drama (3)** Intensive study of selected problems, issues, writers, traditions, or movements in drama. Repeatable one time. Pre: 320 and one other 300-level ENG course; or consent. **DL**

**ENG 463 Studies in Film (3)** Intensive study of selected topics in film, e.g.: genres, major filmmakers, film theory/criticism, or film and literature. Repeatable one time. Pre: 320 and one other 300-level ENG course; or consent. **DH**

**ENG 464 Studies in Life Writing (3)** Intensive study of forms and theories of lifewriting in forms such as biographies, autobiographies, oral histories, diaries, journals, letters, film, drama, and portraiture. Repeatable one time. Pre: 320 and one other 300-level ENG course; or consent. **DL**

**ENG 466 Special Topics: Genre Studies (3)** Intensive study of selected texts that combine traditional genres, cross disciplines, challenge categorization, or are overlooked in the study of larger genre categories such as poetry, fiction, or drama. Repeatable one time. Pre: 320 and one other 300-level ENG course; or consent. **DL**

**ENG 470 Studies in Asia/Pacific Literature (3)** Intensive study of selected problems, issues, traditions, genres, or writers relating to Asia and the Pacific. Repeatable one time. Pre: 320 and one other 300-level ENG course; or consent. **DL**

**ENG 471 Studies in Postcolonial Literature (3)** Intensive study of selected problems, issues, traditions, genres, or writers in postcolonial literatures and theories. Repeatable one time. Pre: 320 and one other 300-level ENG course; or consent. **DL**

**ENG 472 Studies in Diasporic Literature (3)** Intensive study of literary, cultural and theoretical issues of diasporic experiences such as immigration, assimilation, nation, and transnationalism. Repeatable one time. Pre: 320 and one other 300-level ENG course; or consent. **DL**

**ENG 479 Modern Pacific Women’s Poetry (3)** Critical examination of modern indigenous women’s poetry from the Pacific Islands. Thematic concentration on land, family, sexual and national oppression. Pre: any two of the following (second may be taken concurrently): 250, 251, 252, 253, 254, 256, 257; or consent. (Cross-listed as HWST 494) **DL**

**ENG 480 Studies in Literature and Folklore (3)** Intensive study of selected problems, issues, traditions, or genres in folklore and oral traditions and their performance and transformations within specific social and cultural contexts. Repeatable one time. Pre: 320 and one other 300-level ENG course; or consent. **DL**

**ENG 481 Studies in Literature and Popular Culture (3)** Intensive study of selected problems, issues, traditions, writers, movements, or genres in the field of popular literature and/or popular culture. Repeatable one time. Pre: 320 and one other 300-level ENG course; or consent. **DL**

**ENG 482 Studies in Literature and Sexuality and Gender (3)** Intensive study of selected problems and issues in the construction and representation of sexuality and gender in specific genres, social and cultural contexts, or thematic/figurative clusters. Repeatable one time. Pre: 320 and one other 300-level ENG course; or consent. (Cross-listed as WS 483) **DL**

**ENG 491 Senior Honors Tutorial (3)** Studies in history of ideas, periods, genres, or themes in literature. Includes research paper. Offered Fall semester. Repeatable one time. Pre: enrollment in Honors Program, 320 and two 300-level ENG courses; or consent. **DL**

**ENG 492 Senior Honors Tutorial (3)** Studies in history of ideas, periods, genres, or themes in literature. Includes research paper. Offered Spring semester. Repeatable one time. Pre: enrollment in Honors Program, 320, and two ENG 300-level courses; or consent. **DL**

**ENG 494 Study Abroad (V)** Intensive study of selected topics, issues or writers from a host country such as Great Britain, France, Spain, Australia or Argentina. Repeatable one time. A-F only. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; or consent. **DL**

**ENG 495 Internship (3)** Faculty supervised participation in the operations of an organization. A-F only. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 257; junior standing. **DL**

**ENG 499 Directed Reading (V)** Repeatable one time. A-F only. Pre: any two of the following: 250, 251, 252, 253, 254, 255, 256, 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 550 Supervised Teaching Practicum (1)** Supervised participation in instruction or tutoring. CR/NC only. Repeatable twice. Pre: graduate standing and consent.

**ENG 560 HWP Summer Writing Institute (V)**

**ENG 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.

*Graduate standing or consent is required for all courses numbered 600 and above for which no specific prerequisite is listed.*

**ENG 601 Old English (3)** Structure of the language, relation to present English; reading of selected prose and poetry.

**ENG 605 Theory and Practice of Teaching Composition (3)** Major contemporary theorists and classroom practices that evolve from their theories; observation and applications.

**ENG 613 (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: graduate standing plus 411 for (B); 414 for (C); 412 for (D); or consent.

**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. Pre: graduate standing. Fall only.

**ENG 625 (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 consent. Spring only.

**ENG 627 (Alpha) Literary Theory and Criticism (3)** (B) classical period through 18th century; (C) Romantic and post-Romantic.

**ENG 664 Biography (3)** Study of one or more authors, English or American literature. Repeatable one time. A-F only. Pre: graduate standing or consent.

**ENG 691 MA Final Project (V)** Individual reading and research towards preparation of MA project. 3 credit hours required. CR/NC only. Repeatable. Pre: 620, 625 (or concurrent) and consent.

**ENG 699 Directed Reading (V)** Individual reading or research. Pre: graduate standing and consent.

**ENG 700 Thesis Research (V)** Pre: graduate standing and consent.

**ENG 702 Seminar in English Language (3)** Intensive study of one topic in English linguistics. Repeatable.

**ENG 705 Seminar in Composition Studies (3)** Intensive study of selected issues in composition studies. Repeatable. Pre: 625C (or concurrent); or consent.

**ENG 709 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: 625C (or concurrent) or consent.

**ENG 713 Seminar in Creative Writing (3)** Advanced study in creative writing focused on thesis and dissertation projects. Repeatable one time. Pre: 613 or consent.

**ENG 716 (Alpha) Seminar in 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: 613 (or concurrent) or consent.

**ENG 720 Seminar in Critical Writing (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: 625 or equivalent or consent.

**ENG 727 Seminar in Literary Criticism (3)** Intensive study of selected topics in literary theory and its practical application; topics to be announced. Repeatable. Pre: graduate standing or consent.

**ENG 730 (Alpha) Seminar in English Literature (3)** Study of authors or a period. (C) re-reading Chaucer; (N) 14th century poetry; (P) extended Victorian lyric; (Q) modern British fiction; (R) early 17th century poetry; (S) dominant Victorians: the 1840s; (T) Baroque and English literature; (U) literature and social change; (X) literature and history; (Y) studies in satire. Repeatable one time.

**ENG 735 (Alpha) Seminar in American Literature (3)** Study of authors or a period. (B) American modernism; (C) race in American literature; (D) 19th century American poetry; (E) American literature naturalism; (F) African American literature and theory; (G) American transcendentalism; (H) 19th century American novel; (J) contemporary American poetry; (N) poetry by 20th century American women; (P) women writers and multiculturalism; (Q) Asian American literature and theory; (R) relocating American literature; (S) early American literature; (T) H. Melville and T. Morrison. Repeatable.

**ENG 740 (Alpha) Seminar in Major Author (3)** Study of one or more authors, English or American. (C) George Eliot; (D) Emily Dickinson; (M) Milton; (S) Chaucer and his backgrounds; (T) Austen; (U) Yeats and his circle; (X) Beowulf; (Y) Faulkner's narrative (Z) Virginia Woolf. Repeatable one time. A-F only. Pre: graduate standing or consent.

**ENG 745 Seminar in Shakespeare (3)** Intensive study of Shakespeare.

**ENG 760 (Alpha) Seminar in Literary Genres (3)** Study of one or more authors, English or American literature. (C) neoclassicism; (D) tragedy; (E) modern American short story; (F) sonnet and sonnet sequences; (G) Rest., 18th century dramatic comedy; (H) 18th century literature and art; (I) medieval drama; (J) narrative theory and criticism; (K) reinventing the author; (M) laughter and the comic arts; (N) nature of romance; (O) Victorian novel; (P) Jacobean drama; (Q) science fiction; (R) essay, past and present; (S) Eng. hymn in Western culture; (U) biography; (W) 18th century British women novelists; (Y) English romanticism; (Z) English novel and criticism. Repeatable one time. A-F only. Pre: graduate standing or consent.

**ENG 763 Seminar in Film Theory and Criticism (3)** Classic theories of representation and aesthetics; modern and contemporary cultural, psychoanalytic, and aesthetic theories as they apply to film.

**ENG 764 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. Repeatable one time.

**ENG 770 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. Repeatable one time.

**ENG 772 Seminar in Literatures of Hawaii (3)** Introduction to comparative literature; relationship of Hawaiian to other literatures; sources and influences. Repeatable.

**ENG 775 Seminar in Cultural Studies (3)** Intensive study of selected issues in cultural studies and cultural and social theory; topics to be announced. Repeatable one time.

**ENG 780 (Alpha) Seminar in Comparative Literature (3)** Introduction to comparative literature; relationship of English to other literatures; sources and influences. (B) African lit. and literary theory; (F) folklore and literature; (G) theory/practice of poetry; (H) contemporary drama; (I) mythic method; (J) postmodern fiction; (M) modernism; (N) colonial/postcolonial; (P) postmodernism and



postcolonialism; (W) medieval women writers. Repeatable.

**ENG 790 Seminar in Special Topics (3)**  
Content to be announced. Repeatable.

**ENG 800 Dissertation Research (V)** Pre: graduate standing and consent.

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### English Language Institute (ELI)

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*College of Languages, Linguistics and Literature*

*Initial placement in ELI courses is by examination only. A grade of CR (credit) is prerequisite to promotion or exemption. Normal course sequence is 70, 80; 72, 82; 73, 83 or ELI 100.*

**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.

**ELI 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.)

**ELI 111 Practicum for International Teaching Assistants (3)**

Extensive practice for international teaching assistants in speaking in classroom situations with emphasis on oral skills, American cultural expectations and classroom management. CR/NC only. Pre: 080.

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### ENGR

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*See Engineering*

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### Entomology (ENTO)

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*See Plant and Environmental Protection Sciences*

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### Ethnic Studies (ES)

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*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. **DS**

**ES 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." **DS**

**ES 301 Ethnic Identity (3)** Individual and group problems of identity, identity conflict, culture conflict, inter-ethnic relations. Critical review of available material on Hawai'i. Pre: one social sciences core course. **DS**

**ES 305 African American Experience I (3)** Afrocentric perspective. Analysis of the black political/cultural diaspora, including ancient African kingdoms, the slavery experience, organized resistance, emancipation struggles, the Civil War and Reconstruction. Pre: one social sciences core course or consent. **DS**

**ES 306 African American Experience II (3)** Afrocentric socio political analysis. The struggle for freedom: Reconstruction period, reign of terror, intellectual and cultural awakenings, civil rights movements, contemporary issues. Pre: one social sciences core course or consent. **DS**

**ES 310 Ethnicity and Community: Hawai'i (3)** Site visits to museums, social welfare units, etc., as well as guest lecturers from the community including police, health, education. Pre: one social sciences course. (Summer only) **DS**

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

**ES 320 Hawai'i and the Pacific (3)** Hawai'i as part of the Pacific community: selected historical and contemporary problems of Pacific areas; cultural and economic imperialism, land alienation, and the impact of development on Pacific peoples. Pre: one social sciences core course. **DH**

**ES 330 Japanese in Hawai'i (3)** Issei roots in Japan; the role of Japanese in labor, politics, and business; sansei and perspectives on local identity and culture. The Japanese in light of changing economic, social, and political conditions in Hawai'i today. Pre: one social sciences core course. **DH**

**ES 331 Chinese in Hawai'i (3)** Ethnohistorical and contemporary view of the experiences of the Chinese in Hawai'i and U.S. Mainland; specific roles and contributions; immigration, social organization, and identity. Pre: one social sciences core course. **DH**

**ES 332 Caucasians in Hawai'i (3)** Historical and current views of white ethnic groups in Hawai'i; significance in economic and social development of Hawaiian society. Pre: one social sciences core course. **DH**

**ES 333 Filipinos in Hawai'i (3)** Historical and contemporary experiences; immigration; traditional culture and values; plantation experience; labor organizing; development of

Filipino community. Racism, discrimination, and ethnic identity. Pre: one social sciences core course or consent. **DH**

**ES 335 Koreans in Hawai'i (3)** Historical and contemporary experiences, causes and patterns of immigration, conditions on plantations, ties to Korea, community development and roles in society. Pre: one social sciences core course. **DH**

**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. **DH**

**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. **DH**

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

**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. **DS**

**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. **DH**

**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) **DS**

**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 ENG 370) **DL**

**ES 372 Asian American Literature (3)** Basic concepts and representative texts for the study of Asian American literature by writers from a variety of backgrounds. Pre: any two of the following: ENG 250, 251, 252, 253, 254, 255, 256, 257; second may be taken concurrently; or consent. (Cross-listed as ENG 372) **DL**

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

**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. **DS**

**ES 390 Gender and Race in U.S. Society (3)** Historical and sociological studies of race and gender in U.S. society; grassroots feminist and race/ethnic activism in the mainland and Hawai'i. A-F only. Pre: 101, WS 151, or Social Science Cores. (Cross-listed as WS 390) **DS**

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

**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. **DS**

**ES 418 Women and Work (3)** Gender and racial division of labor nationally and internationally; racial and gender differentials in wages, training, working conditions and unemployment; historical trends and future directions. Pre: One 300-level SOC or WS or ES course. (Cross-listed as SOC 418 and WS 418) **DS**

**ES 420 American Ethnic and Race Relations (3)** Surveys ethnic and race relations in the U.S. Focus on historical conflicts and critical issues such as racism, immigration, affirmative action, changing economic structures, and the role of government. Pre: 101 or consent. **DS**

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

**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). **DS**

**ES 456 Racism and Ethnicity in Hawai'i (3)** The historical and contemporary social processes involved in inter-ethnic relations in Hawai'i. Pre: SOC 300 or one Social Science core course; or consent. (Cross-listed as SOC 456)

**ES 480 Qualitative Research Methods (3)** Introduction to qualitative data collection methods; explore methods of analyzing data including grounded theory method, discourse analysis, and narrative analysis and those used in ethnic, gender, and community studies. A-F only. Pre: one upper division ES or SOCS course or consent.

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

**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. **DS**

**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. **DH**

**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. **DH**

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## European Languages

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*See Languages and Literatures of Europe and the Americas (LLEA)*

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## Family Medicine and Community Health (FMCH)

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*School of Medicine*

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

**FMCH 532 Family Medicine and Community Health Longitudinal Clerkship (10)** 5.5-month ambulatory clerkship. Students will learn history taking, physical exam skills, and management of family medicine patients of all ages. Emphasis on behavioral care, preventive care, and common ambulatory problems, both acute and chronic. Repeatable one time. CR/NC only. Pre: BIOM 555. Co-requisite: MED 532, OBGN 532, PED 532, PSTY 532, and SURG 532.

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

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

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## Family Resources (FAMR)

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*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 inquiry into factors affecting growth and development. **DS**

**FAMR 331 Infancy and Early Childhood (3)** Growth and development from prenatal period to age 5. Historical and current issues and research based on ecological, cross-cultural perspective. Focus on optimal development. Pre: 230 or consent. **DS**

**FAMR 332 Childhood (3)** Intensive investigation into developmental aspects of 6–12 year old children. Historical and current issues, research, and examination of the role of schools and other community resources. Focus on optimal development. Pre: 230 or consent. **DS**

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

**FAMR 335 Middle Age and Aging (3)** Change and continuity in midlife and late life from theoretical and applied perspectives. Coverage of physical and psychological events as well as social attitudes, values, and programs regarding aging. Pre: 230. **DS**

**FAMR 340 Family Development (3)** Family functioning and development over the family life cycle; family stages, tasks, interaction, adjustment, and growth in various cultures. Pre: 230 or PSY 100 or SOC 100; or consent. **DS**

**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: 230 or APDM 200, or consent.

**FAMR 352 Community Needs and Resources (3)** Theory and practice in determining community needs and resources; community resources development based on needs identification. Pre: 230 or consent. **DS**

**FAMR 360 Family Resource Management (3)** Concepts, principles, and practices in managing family and household resources. Pre: 230 or consent.

**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 or an ECON course, or consent.

**FAMR 363 Consumer Economics (3)** Consumer rights, responsibilities, and resources; consumer decision-making; factors affecting consumer functioning within economy. Pre: 360 or an ECON course, or consent.

**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 APDM 200, or consent. Co-requisite: 380L. **DS**

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

**FAMR 442 Marriage Development (3)** Marital interaction and development; divorce and remarriage; resources and techniques for

marital adjustment, enrichment, and growth. 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 or consent. **DS**

**FAMR 445 Family Life Education Methodology (V)** Lecture, discussion and hands-on course, with service learning option, on Family Life Education Methodology. Repeatable one time. Pre: 341 or 442, or consent.

**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 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. **DS**

**FAMR 455 Consumer Communications (3)** Development, production, analysis, and evaluation of consumer materials for print media. Use of desktop publishing computer programs. Pre: 360 or an ECON course; 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 or an ECON course, or consent.

**FAMR 482W Senior Seminar (3)** Preparation, presentation, and discussion of student research papers dealing with selected topics in family resources. Pre: 230, 340, 350, 352, 360, 380 and 380L; or consent.

**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: 230, 340, 350, 352, 360, 380 and 380L; or 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.

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## Filipino (FIL)

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*College of Languages, Linguistics and Literature*

**FIL 101 Beginning Filipino (4)** Listening, speaking, reading, writing skills. Structural points introduced inductively. Co-curricular cultural activities included. Meets four hours weekly; daily lab work. **HSL**

**FIL 102 Beginning Filipino (4)** Continuation of 101. Pre: 101 or consent. **HSL**

**FIL 111 Intensive Elementary Filipino (6)** Emphasis on communication through integrated development of listening, speaking, reading, and writing skills. Co-curricular cultural activities included. Meets 20 hours a week for six weeks. **HSL**

**FIL 112 Intensive Elementary Filipino (10)** **HSL**

**FIL 201 Intermediate Filipino (4)** Continuation of 102. Co-curricular cultural activities included. Meets four hours weekly; daily lab work. Pre: 102 or consent. **HSL**

**FIL 202 Intermediate Filipino (4)** Continuation of 201. Pre: 201 or consent. **HSL**

**FIL 212 Intensive Intermediate Filipino (10)** **HSL**

**FIL 224 Filipino for Education (4)** Continuation of 102. Lessons focus on various aspects of Philippine culture and specialized topics that cater to the needs of teachers intending to teach Filipino immigrant students or teach Filipino as a second language. Meets five hours a week; daily lab work. Pre: 102. **HSL**

**FIL 225 Filipino for Education (4)** Continuation of 202 or 224. **HSL**

**FIL 301 Third-Level Filipino (3)** Continuation of 202. Conversation, advanced reading, and composition. Co-curricular cultural activities included. Meets three times weekly. Pre: 202 or 225, or consent.

**FIL 302 Third-Level Filipino (3)** Continuation of 301.

**FIL 303 Accelerated Third-Level Filipino (6)**

**FIL 315 Filipino Aural Comprehension (3)** Training in comprehension of spoken authentic/simulated authentic materials presented in news broadcasts, songs, documentary narration, formal lectures, radio and television soap operas, etc. Pre: 202 or consent.

**FIL 330 Filipino Film: Art and History (3)** Study and analysis of Filipino films: its history, forms, development and relationship to cultural, social, philosophical, and aesthetic context. Pre: 302 or consent. **DA**

**FIL 401 Fourth-Level Filipino (3)** Continuation of 302. Advanced reading in current literature; discussion of cultural implications; advanced conversation and composition. Co-curricular cultural activities included. Meets three times weekly. Pre: 302 or consent.

**FIL 402 Fourth-Level Filipino (3)** Continuation of 401.

**FIL 415 Advanced Filipino Aural Comprehension (3)** This is a continuation of Filipino 315. Training in comprehension and analysis/criticism of spoken authentic materials through films. Pre: 315 or consent. **DL**

**FIL 435 Filipino Translation Techniques (3)** Techniques of bilingual translation: Filipino to English and English to Filipino. A-F only. Pre: 302 or consent.

**FIL 451 Structure of Filipino (3)** Introduction to phonology, morphology, syntax. Pre: 202 or consent. **DH**

**FIL 461 Filipino Contemporary Literature (3)** Selected readings in poetry, short stories, and plays from early 1900s to present. Co-curricular cultural activities included. Pre: 302 or consent. **DL**

**FIL 462 Filipino Traditional Literature (3)** Pre-20th-century folk literature: epics, legends, folktales, myths, and indigenous drama. Co-curricular cultural activities included. Pre: 302 or consent. **DL**

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## Finance (FIN)

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*College of Business Administration*

**FIN 301 Personal Finance (3)** The course focuses on principles and techniques for handling personal financial decisions, including: personal budgeting, obtaining credit, life and casualty insurance, buying a home, buying an automobile, savings and investments, and retirement planning.

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

**FIN 307 Corporate Financial Management (3)** Development and analysis of modern financial theory and its implications for management decisions: market efficiency, capital asset pricing, firm investment decisions, capital structure, dividend policy, and cost of capital. 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 321 International Business Finance (3)** Financial management of foreign and international business operations: the regulatory environment of international finance, financing international transactions, international capital markets, taxation. Financial decision-making in the firm. 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 341 Financial Aspects of New Ventures (3)** Examination of underlying business models for new ventures, how to determine corresponding financial requirements, and approaches to resource acquisition. Students explore a range of

financing sources and related issues of valuation and deal structure. Pre: junior standing and BUS 314; or consent.

**FIN 367 Seminar in Financial Planning (3)** A capstone course for financial services and planning track. This is a case study course intended to provide students the opportunity to integrate concepts from earlier courses and develop a comprehensive view of the financial planning process. A-F only. Pre: 301 and 311 and two of the following courses: 490E, 490F, ACC 401, INS 300.

**FIN 389 Applied Economic and Financial Forecasting (3)** Techniques of forecasting, such as exponential smoothing, regression, and Box-Jenkins. Review of available computer software. Applications to economic analysis of industries and firms in national and international settings. Pre: BUS 310 and BUS 314.

**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 412 Options and Other Derivatives (3)** Options and other derivatives. Equity options, index options and options on futures. Black-Scholes Model. Trading strategies and tactics. Contemporary developments in financial engineering. A-F only. Pre: BUS 314 or consent.

**FIN 415 Security Analysis and Portfolio Management (3)** Security analysis and portfolio management from standpoint of the professional analyst and institutional investor. Recent advances in security valuation models, portfolio selection, and techniques for appraising portfolio performance. A-F only. Pre: 311.

**FIN 444 Asian Finance (3)** Financial systems, regulatory structure over financial institutions in the Asia-Pacific region. Major financial policy issues for financial sector reforms in the region. Seminar format. A-F only. Pre: BUS 314 or consent.

**FIN 470 Asian Business Environment (3)** Status and role of Asian business; current technological, economic, and financial developments; impact on world economy. Pre: BUS 314, BUS 617 or consent. (Cross-listed as ASAN 470)

**FIN 490 (Alpha) Advanced Topics in Finance (3)** In-depth analysis of selected current practices and issues in finance. (C) Japanese financial management; (D) financial analysis (repeatable four times); (E) retirement and employee benefit planning; (F) finance estate planning. A-F only for (E) and (F). Pre: BUS 314 or BUS 617 for (C); 311 or 634 for (D); 301 for (E) and (F).

**FIN 625 Monetary Systems and Financial Markets (3)** Supply and demand for capital in national and international markets. Nature of capital movements and role of capital in industrialization of regions and nations. Pre: BUS 610 or consent.

**FIN 633 Problems in Business Finance (3)** Application of financial principles and analytical techniques to financial problems. Case method. Pre: BUS 617 or consent.

**FIN 634 Investment Analysis and Management (3)** Techniques of security analysis, theories of investment, and the analysis of investment decisions related to portfolio planning. Pre: BUS 617 or consent.

**FIN 635 (Alpha) Advanced Topics in Finance (3)** Major current financial issues and problems. (C) Japanese financial management; (D) portfolio management theory; (E) capital asset analysis; (F) stocks, bonds, and modern instruments. Pre: BUS 617 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 617 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 617 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 617 or consent.

**FIN 641 Entrepreneurial Finance (3)** Assessment of financial needs, arranging venture financing, assessing value to the entrepreneur and the investor(s), financial aspects of strategic planning, analyzing the tradeoffs between alternative financing choices and flexibility and control, harvesting the investment. Pre: BUS 617 or consent.

**FIN 645 Advanced Capital Markets (3)** Regulatory structure over capital market institutions, market developmental issues, market microstructure issues, and corporate governance, and creation of capital market infrastructure. Seminar format. Pre: BUS 617 or consent.

**FIN 660 Seminar in Finance (3)** In-depth analysis of selected current practices and issues in finance. Pre: BUS 617 or consent. May be repeated with change in topic.

**FIN 701 Theory of International Finance (3)** Concise framework of conceptual knowledge to understand the literature on financial theory and related empirical evidence. Includes fundamentals of capital markets, capital budgeting, utility theory, asset pricing, and international finance. A-F only. Pre: PhD student status in international management or consent.

**FIN 702 Seminar in International Investments (3)** Seminar covers research issues and methodologies in investments and capital markets. Main topics include theories and empirical characteristics of asset pricing, portfolio diversification and performance evaluation, derivatives, and risk management. A-F only. Pre: 701 and PhD student status in international management; or consent.

**FIN 703 International Corporate Control and Restructuring (3)** Provides and understanding of some of the scholarly research in corporate control and restructuring. Topics include: mergers and takeovers, international

corporate governance, corporate restructuring, raising capital, and entrepreneurship. A-F only. Pre: 701 and PhD student status in international management; or consent.

**FIN 704 International Asian Finance (3)** In-depth review of scholarly journal articles and working papers relevant to Asian finance to prepare PhD students for scholarly research work. A-F only. Pre: 701 and PhD student status in international management; or consent.

**FIN 799 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 department chair and the faculty adviser. A-F only. Pre: PhD student status in international management or consent.

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## Food Science and Human Nutrition (FSHN)

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*College of Tropical Agriculture and Human Resources*

**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 one time.

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

**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. **DB**

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

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

**FSHN 281 Experimental Foods (4)** (3 Lec, 1 3-hr Lab) An experimental approach to study food preparation problems. Applying basic food science research design to conduct experiments, interpret data and write reports. Subject matter used to practice critical thinking and problem solving skills. Pre: 181, 181L, CHEM 152 or similar organic chemistry course, the equivalent of two years of high school algebra; or consent. **DB**

**FSHN 310 Purchasing for Instructional Food Service (3)** Principles of purchasing management in institutional food service. Emphasis on menu planning, cost control, and purchasing/procurement responsibilities. Lectures and group project. Pre: 185, 312 (or concurrent), TIM 184 or consent. Once a year.

**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. Requires completion of one related internship. Pre: 181 or TIM 315, or consent. (Cross-listed as TIM 319)

**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 or consent. Spring only. **DB**

**FSHN 322 Marketing Perishable Products (3)** Problems, agencies, functions, costs, prices, regulations affecting marketing; proposed improvements. Pre: ECON 130, NREM 220 or consent. (Alt. years) (Cross-listed as TPSS 322) **DS**

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

**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 and 244 or ANSC 244 or consent. Spring only. **DB**

**FSHN 389 Nutritional Assessment (2)** This course addresses concepts and uses of nutrition assessment tools at individual and community levels. Students will be introduced to national surveys and new, more sophisticated body composition measurements. Repeatable one time. A-F only. Pre: 185, 370 (or concurrent) or consent. Co-requisite: 370.

**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, MICR 130, and MICR 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: MICR 130. (Alt. years) **DB**

**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: 312 or TIM 319, and MGT 301 or TIM 303; or consent.

**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: spring) **DP**

**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) **DP**

**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) **DY**

**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) **DB**

**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 FAMR 380 or NREM 310; or consent.

**FSHN 452 Concepts in Nutrition Education (3)** (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 one time. Pre: 451 and 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. **DB**

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

**FSHN 469 Nutrition Counseling Skills (2)** Theory and practice in nutritional counseling. Combined lecture and discussion on nutrition/dietary counseling. Knowledge and theories. Application through lab experiences including role playing, case presentations, and performing actual counseling sessions. A-F only. Pre: 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. **DB**

**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: 430, CHEM 162, or BIOL 402, MBBE 402, or PEPS 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. Co-requisite: 477. (Alt. years: spring) **DY**

**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 or consent. (Cross-listed as KLS 480) **DB**

**FSHN 482 Current Topics in Food and Nutritional Sciences (1)** Provides a forum for the discussion of topics of current relevance to students preparing for careers in these fields. 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 300 or 400 level biochemistry; or consent. **DB**

**FSHN 486 Nutritional Biochemistry II (3)** Metabolism and biochemistry of vitamins, minerals, and dietary fiber, including chemical structure, digestion, absorption, transport, and cellular/molecular functions in human nutrition; relevance to establishing nutrient requirements and to mechanisms of chronic disease. Repeatable one time. Pre: 485 or consent. **DB**

**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 one time. 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, or laboratory experiments. Repeatable with instructor consent.

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

**FSHN 499 Directed Reading and Research (V)**

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

**FSHN 601 The Science of Food Systems (1)** (1 2-hr Discussion) Discussion of food systems as they apply to animal science, food science, and human nutrition. Repeatable one time. Pre: graduate standing in animal sciences, food science, nutritional sciences; or consent.

**FSHN 607 Advanced Food Science I (3)** Advanced topics in chemical and physical characteristics of foods as well as their role in human nutrition. Repeatable one time. A-F only. Pre: graduate student status with undergraduate courses in organic chemistry, microbiology, additional biological science, physics, and biochemistry. Basic knowledge of food science is expected; or consent. Fall only. (Cross-listed as MBBE 607 and TPSS 607)

**FSHN 608 Advanced Food Science II (3)** Advances in sensory quality and evaluation, deterioration of foods and food safety, as well as food processing technology. Repeatable one time. A-F only. Pre: graduate student status with undergraduate courses in organic chemistry, microbiology, additional biological sciences, physics, and biochemistry. Basic knowledge of food science is expected; or consent. Spring only. (Cross-listed as MBBE 608 and TPSS 608)

**FSHN 609 Advanced Food Safety (3)** Real and perceived food hazards, their ethical issues and implications, advanced emerging topics in food safety, and controls, including laws and regulations of food safety issues and public perception of food safety will be discussed. Repeatable one time. A-F only. Pre: graduate student status with undergraduate courses in biochemistry, microbiology, food processing, physics and organic chemistry. Basic food science knowledge is required; or consent. Spring only. (Cross-listed as MBBE 609 and TPSS 609)

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

**FSHN 630 Advanced Food Chemistry (2)** (1 Lec, 1 2-hr Discussion) Combined lecture-discussion course on the chemistry of selected functional components, e.g., vitamins, minerals, flavors and pigments. Repeatable one time. Pre: 430, MBBE 402 or PEPS 402; or consent.

**FSHN 631 Nutritional Epidemiology (3)** Dietary, biochemical, anthropometric and clinical methods used for evaluating nutrition and diet in the etiology and epidemiology of disease. Pre: 185 or consent. (Cross-listed as PH 631)

**FSHN 633 International Nutrition (3)** Analysis of major nutrition problems in developing countries. Comparative review of the design, implementation, and evaluation of programs to intervene in the development of malnutrition. Pre: 185 or consent. (Cross-listed as PH 633)

**FSHN 652 Information Research Skills (1)** Examines the use of libraries and information technology for scholarly investigation in support of scientific research; provides experience utilizing and critically evaluating a variety of print and electronic sources in basic and applied sciences. Pre: consent. (Cross-listed as ANSC 652 and TPSS 652)

**FSHN 681 Seminar in Food and Nutritional Sciences (1)** Student presentation of literature

reviews and research. Repeatable. Pre: consent.

**FSHN 682 Topics in Nutritional Sciences (1)** Advanced topics in nutritional sciences, from basic to applied research, including current issues in nutrition and critical analysis of current research literature. Repeatable. Pre: consent.

**FSHN 683 Nutrition Policy Analysis (2)** The analysis of agricultural, economic, and social policies that affect food security and nutrition. Pre: NREM 310 and consent. (Alt. years: fall)

**FSHN 685 Nutrition and Disease: Cellular and Molecular Aspects (2)** In-depth lecture and discussion of selected topics relating nutrition to the etiology and prevention of chronic diseases at the cellular and molecular level. Repeatable one time. Pre: 485 and 486; statistics; or consent. Spring only.

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

**FSHN 695 Plan B Master's Project (3)** Independent study for students working on a Plan B Master's project. A grade of Satisfactory (S) is assigned when the project is satisfactorily completed. A-F only. Pre: graduate standing in nutritional sciences.

**FSHN 699 Directed Reading and Research (V)**

**FSHN 700 Thesis Research (V)**

**FSHN 701 Topics in Food Science (1)** Advanced topics in food science and technology, from basic to applied research, including current issues in food science and technology and critical analysis of current research literature. Repeatable one time. A-F only. Pre: graduate standing or consent. Spring only. (Cross-listed as MBBE 701 and TPSS 701)

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## FPCH

*See Family Practice and Community Health*

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## French (FR)

*College of Languages, Linguistics and Literature*

*All courses are conducted in French.*

**FR 101 Elementary French (3)** Conversation, grammar, and reading. **HSL**

**FR 102 Elementary French (3)** Conversation, grammar, and reading. Pre: 101 or consent. **HSL**

**FR 201 Intermediate French (3)** Reading, conversation, laboratory drill, composition. Pre: 102 or equivalent. **HSL**

**FR 202 Intermediate French (3)** Continuation of 201. Pre: 201. **HSL**

**FR 258 Intermediate French Abroad (3)** Intensive course of full-time formal instruction on the second-year level in French language and culture in a French-speaking country. Pre: 102 or equivalent. **HSL**

**FR 259 Intermediate French Abroad (3)** Continuation of 258. **HSL**

**FR 260 Intensive Intermediate French Abroad (V)** Intensive course of formal instruction on the second-year level in French language and culture in a French-speaking country. For semester programs only. Pre: 102. **HSL**

**FR 301 French Phonetics (3)** Analysis of phonological system; methods of teaching pronunciation; understanding various types of spontaneous speech. Drills in pronunciation, intonation, stress, and rhythm. Pre: 202 or consent. **DH**

**FR 306 Structure of French (3)** Structure of contemporary French as analyzed by descriptive linguists. Pre: 202. **DH**

**FR 309 Business French (3)** Reading and writing commercial materials. Pre: 202.

**FR 311 Conversation (3)** Systematic practice for control of spoken French. Further development of vocabulary for accurate, mature expression. Pre: 202.

**FR 312 Composition (3)** Emphasis on strengthening facility with language through further training in syntax, structure, and composition writing. Pre: 202.

**FR 331 Survey of French Literature (3)** Major authors and movements. Pre: 311 and 312; only one may be concurrent. **DL**

**FR 332 Survey of French Literature (3)** Continuation of 331. Pre: 311 and 312; only one may be concurrent. **DL**

**FR 358 Third-Level French Abroad (3)** Intensive course of full-time formal instruction on the third-year level in French language and culture in a French-speaking country. Pre: 202 or 259 or 260 or equivalent.

**FR 359 Third-Level French Abroad (3)** Continuation of 358.

**FR 360 Intensive Third-Level French Abroad (V)** Intensive course of formal instruction on the third-year level in French language and culture in a French-speaking country. For semester programs only. Pre: 202 or 260 or equivalent.

**FR 361 Contemporary French Civilization (3)** Survey of culture and institutions of modern France. Pre: 202. **DH**

**FR 364 Survey of French Civilization (3)** A historical survey of the development of French culture. The course is interdisciplinary, focusing on the relations between politics, literature, science, and the arts. Pre: 202 or consent. **DH**

**FR 391 (Alpha) Topics in French Literature (3)** (B) French film; (C) the Fantastic; (D) Francophone literature. Pre: 311 or 312, or consent. Repeatable with consent. **DL**

**FR 405 Advanced Oral and Written Expression (3)** Further development of listening, comprehension, speaking, and writing skills through viewing of French videotapes, reading French newspapers, frequent oral and written reports. Pre: 311 and 312, and/or 306, or 358, or 360; or consent.

**FR 406 French-English Translation (3)** Practice in techniques based on contrastive linguistics. Translation of texts from various fields from French into English and the reverse. Pre: 306 or 309, and 312; or consent.

**FR 408 Masterpieces of Medieval Literature (3)** Samplings from epic, novel, verse and prose,

tale, lyric poetry, chronicle, theater, didactic literature. Elementary readings in original text in editions giving modern French translation. Pre: 331 or consent. **DL**

**FR 410 Masterpieces of 16th-Century Literature (3)** Samplings from all major writers of the period. Readings in original text in editions giving modern French equivalents for difficult words. Pre: 331 or consent. **DL**

**FR 411 Masterpieces of 17th-Century Literature (3)** Principal works of major dramatists: Corneille, Moliere, Racine. Principal movements and major authors of non-dramatic prose and poetry. Pre: 331 or consent. **DL**

**FR 413 Masterpieces of 18th-Century Literature (3)** Pre: 332 or consent. **DL**

**FR 417 19th Century French Prose and Poetry (3)** Study of representative prose and poetry of the major trends of 19th century France: romanticism, realism, symbolism, aestheticism. Pre: 332 or consent. **DL**

**FR 421 20th-Century French Theater (3)** Major French playwrights and their works: Claudel, Giraudoux, Anouilh, Sartre, Camus, etc. Pre: 332 or consent. **DL**

**FR 423 20th Century French Prose and Poetry (3)** Study of representative prose and poetry of the major trends of 20th century France: modernism, surrealism, existentialism, postmodernism and multiculturalism. Pre: 332 or consent. **DL**

**FR 458 Fourth-Level French Abroad (3)** Intensive course of full-time formal instruction on the fourth-year level in French linguistics, civilization, culture, and literature in a French-speaking country. Pre: 359 or 360 or equivalent.

**FR 459 Fourth-Level French Abroad (3)** Continuation of 458.

**FR 460 Intensive Fourth-Level French Abroad (V)** Intensive course of formal instruction on the fourth-year level in French language, culture and literature in a French-speaking country. For semester programs only. Pre: 360 or equivalent.

**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. **DL**

**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 609 French Renaissance (3)** Poetry, theater, prose. Emphasis on Montaigne and Rabelais. Lectures, discussions, reports.

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

**FR 651 Philosophic 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 external stylistics. Contrastive analysis of structures of French and English. Translation into French and from French.

**FR 671 History of the French Language (3)** Origins and development of French language in its cultural context. Contrastive analysis.

**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.

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## FSHN

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*See Food Science and Human Nutrition*

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## Geography (GEOG)

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*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. **DP**

**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). **DY**

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

**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. **FG**

**GEOG 300 Introduction to Climatology (3)** Elements and controls of climate. World patterns of insolation, temperature, evaporation, precipitation, atmospheric circulation. Climatic classifications. Pre: 101. **DP**

**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. **DP**

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

**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. **DS**

**GEOG 309 Plants, People and Ecosystems (3)** Introduction to ecosystem concept; environmental adaptations for energy and nutrient transfer; characteristics, dynamics, productivity, and distribution of principal vegetation communities. Human dominance. Pre: 101. **DB**

**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 nonmajors. **DS**

**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. **DS**

**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. **DS**

**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) **DS**

**GEOG 325 World Resources and Economic Development (3)** The pattern of world economic development. Agricultural resources and industries. Mineral resources, energy and metal industries. Manufacturing industries in development. The network of world trade, regional associations, and international economic aid. **DS**

**GEOG 326 Environment, Resources and Society (3)** Human interaction with the environment. Changes in concept of conservation. Ecological, philosophical, and political aspects of present environmental dilemmas. Problems in Hawai'i, U.S., and developing world. **DS**

**GEOG 328 Culture and Environment (3)** Introduction to cultural geography, the cultural landscape, and built environment. Pre: consent. **DS**

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

**GEOG 335 Political Geography (3)** Political organization of area in the nation state; geo-

graphic background of international relations. Boundaries and disputed territories, exploitation of physical resources, evolving geography of the territorial sea and zones of exclusive economic interest. **DS**

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

**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. **DS**

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

**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. **DS**

**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. **DS**

**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. **DS**

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

**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. **DS**

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

**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, thematic 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 Geography I (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). **DS**

**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. **DS**

**GEOG 387 Computer-Assisted Cartography (3)** Display techniques for statistical and terrain data using software packages. Graphic-to-digital-data conversion. Cartographic data structures and processing algorithms. Stresses map design. Pre: 380 or consent. **DS**

**GEOG 390 Tutorial in Geography (3)** Concepts and methods in geographic analysis. Application to local problems through short field trips. Research on topics of special interest. Required of majors in junior year. **DS**

**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. **DP**

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

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

**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: 303 or GG 306 **DP**

**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: 303 or GG 306. **DP**

**GEOG 405 Water in the Environment (3)** Water fluxes in the environment. Occurrence and movement of water; methods of quantification. Water balance of soil-plant system: precipitation, interception, infiltration, runoff, soil moisture, evapotranspiration, and groundwater recharge. Pre: 101 or MET 101. **DP**

**GEOG 409 Cultural Biogeography (3)** Coevolution of human societies and plants over the last 10,000 years. Foraging, farming and urban societies economies; spread and modification of selected plants; issues of preservation of genetic resources and traditional plant knowledge. The form and function of gardens. A-F only. Pre: 101. (Cross-listed as TPSS 409) **DS**

**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) **DB**

**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. **DS**

**GEOG 412 Environmental Impact Assessment (3)** Theory and practice. Critique and writing of environmental impact statements. Field study of local projects. Pre: upper division standing in environmental discipline. **DS**

**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. **DS**

**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 MBBE 420 and NURS 430) **DB**

**GEOG 421 Urban Geography (3)** Origins, functions, and internal structure of cities. Problems of urban settlement, growth, decay, adaptation, and planning in different cultural and historical settings. Dynamics of urban land use and role of policies and perceptions in shaping towns and cities. Pre: 102 or 151. **DS**

**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. Pre: 151 or 328. **DH**

**GEOG 435 Political Geography of Oceans (3)** The oceans' evolution and relation to problems of economic development, resources, seapower, shipping, trade. Pre: 335 or consent. **DS**

**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. Pre: 102 or consent. **DS**

**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. Pre: 101 or 636, and SOCS 225 (or equivalent); or consent. **DS**

**GEOG 468 (Alpha) Topics in Hawaiian Geography (3)** Selected topics in the geography of Hawai'i. Repeatable. Pre: 368. **DS**

**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. Pre: 375 or consent. **DS**

**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. Pre: 375. DS

**GEOG 475 Cartographic Illustration (3)** (3 2-hr Lab) Tools and methods for preparation of cartographic materials for illustration and publication; drafting and reproduction. Pre: 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, experimental cartography. Pre: 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. Pre: 380 or consent. DS

**GEOG 487 Advanced Computer-Assisted Cartography (3)** Concepts underlying computer programming for cartographic applications. Pre: 375 and FORTRAN programming ability, or consent.

**GEOG 488 Geographic Information Systems (3)** Design, implementation, and use. Database construction and documentation. Techniques for spatial data manipulation and display. Evaluation of existing systems. Student research projects. Pre: 375. DS

**GEOG 490 Senior Thesis (3)** Preparation of research paper under individual faculty supervision. Recommended for admission to graduate program. Pre: 390.

**GEOG 491 Teaching Geography (6)** For geography majors who lead, under supervision, a freshman seminar section of geography. Pre: 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. Pre: senior major and consent.

**GEOG 600 Seminar in Climatology (3)** Methods of determining energy budget and water balance; applications in agriculture, hydrology, climatic classifications. Theory of climatic change. Bibliography. Pre: 300 or consent.

**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. Pre: 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 methodology. (B) renewable; (C) nonrenewable. Pre: consent.

**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. Pre: 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. Pre: consent. (Cross-listed as ANTH 632)

**GEOG 633 Globalization and Urban Policy (3)** Urbanization and urban policies in the Asia and Pacific region with focus on the international dimension of national and local spatial restructuring. Pre: 630 or PLAN 603, or consent. (Cross-listed as PLAN 633)

**GEOG 635 Economic Analysis for Urban Planning and Policy (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 one time. Pre: consent. (Cross-listed as PLAN 603)

**GEOG 636 Resource Systems Optimization (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. Pre: one of MATH 215, MATH 241, MATH 251A, or consent. (Cross-listed as NREM 610 and BE 638)

**GEOG 637 Environment and Development (3)** Theories and practice of development; how changing development paradigms shape different ideas concerning the environment and the management of natural resources; emerging debates in development and environment in post-modern era. (Cross-listed as PLAN 637)

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

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

**GEOG 651 Seminar in Geography of China (3)** Repeatable. Pre: consent.

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

**GEOG 653 Seminar in Geography of South Asia (3)** Repeatable. Pre: consent.

**GEOG 654 Seminar in Geography of Southeast Asia (3)** Repeatable. Pre: consent.

**GEOG 665 Seminar in Geography of the Pacific (3)** Investigation of geographic problems of Melanesia, Micronesia, Polynesia. Repeatable. Pre: consent.

**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 680 Geospatial Analysis of Natural Resource Data (3)** The application of

geostatistics to estimate spatial dependence to improve soil and regional sampling; provide insight into underlying soil, geographic, and geologic process, and to provide quantitative scaling up of point measurements to fields, regions, and watersheds. State-space modeling also will be included. A-F only. Pre: 488, ZOO 631, or Times Series Analysis course; or consent. (Cross-listed as TPSS 680)

**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. Pre: consent. Co-requisite: 695.

**GEOG 693 Technology and Natural Risks Methods of Analysis (3)** Survey of tools for evaluating risks to human health from technological and natural hazards. Historical and international context of methods. Pre: consent.

**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. Pre: 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. Pre: 695.

**GEOG 699 Directed Research (V)** CR/NC only. Pre: 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. Pre: one of 303, 403, or 404; or consent.

**GEOG 710 (Alpha) Special Topics (V)** Study and discussion of significant topics, problems. (H) Multi-Objective Decision. Repeatable two times. Pre: 455 or 636 or consent.

**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. Pre: AREC 458 or ECON 458, or consent.

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

**GEOG 752 Research Seminar: Resource Management (3)**

**GEOG 753 Research Seminar: Population Geography (3)**

**GEOG 755 Research Seminar: Urban Geography (3)**

**GEOG 756 Research Seminar: Aspects of Development (3)**

**GEOG 757 Research Seminar: Cultural Geography (3)**

**GEOG 758 Research Seminar: Conservation (3)**

**GEOG 761 Research Seminar: Cartography (3)**

**GEOG 762 Research Seminar: Remote Sensing (3)**

**GEOG 763 Research Seminar: Agricultural Geography (3)**

**GEOG 764 Research Seminar: Social Geography (3)**

**GEOG 765 Research Seminar: Coastal and Marine Geography (3)**

**GEOG 766 Society and Space (3)** Advanced seminar on social production of space. Topics include spatial metaphor in social theory; western spatiality from the renaissance through the enlightenment, modernity and post modernity; and geography of the body, home, landscape, and nation. Pre: Graduate standing or consent.

**GEOG 800 Dissertation Research (V)**

## Geology and Geophysics (GG)

*School of Ocean and Earth Science and Technology*

**GG 101 Dynamic Earth (3)** The natural physical environment; the landscape; rocks and minerals, rivers and oceans; volcanism, earthquakes, and other processes inside the earth; effects of human use of the Earth and its resources. Field trip. **DP**

**GG 101L Dynamic Earth Lab (1)** (1 3-hr Lab) Hands-on study of minerals, rocks, and topographic maps. Examine volcanism, hydrology, coastal processes and hazards, geologic time and earthquakes. Field trips to investigate landslides, beaches and O'ahu geology. A-F only. Pre: one of 101, 103, 108, or 168 (or concurrent). **DY**

**GG 103 Geology of the Hawaiian Islands (3)** Hawaiian geology and geologic processes: origin of Hawaiian islands, volcanism, rocks and minerals, landforms, stream and coastal processes, landslides, earthquakes and tsunamis, groundwater, geologic and environmental hazards. Field trip. **DP**

**GG 104 Volcanoes in the Sea (4)** Hawaiian geology and geologic processes: origin of Hawaiian islands, volcanism, rocks and minerals, landforms, stream and coastal processes, landslides, earthquakes and tsunamis, groundwater, geologic and environmental hazards. Frequent required field trips. Credit not given for both 103 and 104. **DP**

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

**GG 108 Controversial Topics in Geology and Geophysics (3)** Earth-science topics of current societal impact or intellectual implications. Students will select three from a list of six topics, such as volcanoes, climate, solar system, plate tectonics, evolution and extinction, and water. Each topic will be considered in a mini-course module five weeks in length. **DP**

**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. **DP**

**GG 170 Physical Geology (4)** (3 Lec, 1 3-hr Lab) Structure, composition and evolution of the Earth; processes responsible for the formation, deformation and transformation of rocks; plate tectonics. Emphasis on quantitative methods, problem solving and critical thinking to geology. Laboratory and field trips required. **DP, DY**

**GG 200 Geological Inquiry (4)** (3 Lec, 1 3-hr Lab) Principal contributions of Earth science to Western culture: origin and age of the solar system and Earth, interior of Earth; records of organic evolution and past environments; predictable process and structure. Pre: 170, 170L, or concurrent; or consent. **DP**

**GG 250 Scientific Programming (3)** (2 Lec, 1 3-hr Lab) Introduction to solving scientific problems by computer programming. Overview of the Matlab programming language and environment. Emphasis placed on good style, logical reasoning and applied mathematics. A-F only. Pre: MATH 241 (or concurrent) or departmental approval.

**GG 300 Volcanology (3)** Volcanic eruptions and their consequences. Includes models for volcanic eruptions including explosive eruptions and lava flows, monitoring of active volcanoes, evaluation and impacts of volcanic hazards, and mitigation of volcanic risk. Field trips. Normally fall. Pre: 200 or consent. **DP**

**GG 301 Mineralogy (4)** (2 Lec, 1 3-hr Lab) Crystallography, crystal chemistry, phase equilibria, and crystal structures. Also covers mineral optics and identification and includes an introduction to modern methods of mineralogy and crystallography. Pre: 200, CHEM 162 and CHEM 162L or CHEM 171 and CHEM 171L; or consent. **DP**

**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. Development of critical thinking and writing skills. Pre: 301 or consent. **DP**

**GG 303 Structural Geology (3)** (2 Lec, 1 3-hr Lab) Introduction to (a) the geometry, kinematics, and mechanics of crustal deformation, and (b) continuum mechanics in geology. Develops skills in three-dimensional thinking through geologic maps, cross sections, various projections, experiments, and vector analyses. Pre: 200, MATH 241 or MATH 251A, and PHYS 151 or PHYS 170; or consent. **DP**

**GG 304 Physics of Earth and Planets (4)** (3 Lec, 1 3-hr Lab) Essentials of geophysics: formation of solar system and Earth, gravity, seismology, heat flow, geomagnetism, isostasy, plate tectonics. Coursework involves application of basic physics to understanding Earth structure. Labs include field surveys and computer analyses. Pre: 303, PHYS 170, MATH 241, and MATH 242; or consent. **DP**

**GG 305 Geological Field Methods (3)** Methods used in geological investigations in the field. Eight hours on Saturday in the field. Pre: 301, 303, and 308. Recommended: 302 and 309. **DP**

**GG 308 Earth History (3)** (2 Lec, 1 3-hr Lab) Physical, chemical, and biological evolution of Earth from its formation to modern times. Fossils applied to dating, stratigraphic correla-

tion, and paleoenvironmental interpretation. Pre: 200 or consent. Fall only. **DP**

**GG 309 Sedimentology and Stratigraphy (4)** (3 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. Repeatable one time. Pre: 301 and 308; or consent. Spring only. **DP**

**GG 312 Geomathematics (3)** Mathematical methods of geologic and geophysical science. Emphasis on application to earth-science problems using linear algebra, vector calculus, ordinary differential equations, and numerical solutions. Pre: MATH 242 or consent. (Cross-listed as OCN 312)

**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. Pre: MATH 242 (or concurrent) or consent.

**GG 325 Fundamentals of Geochemistry (3)** Lecture course on theory and applications of geochemistry and environmental chemistry to Earth and ocean sciences. Topics: Chemistry of Hydrosphere-Geosphere-Biosphere system, origin/differentiation of Earth/Solar System. Pre: 200, MATH 241 or MATH 251A, CHEM 162 (or concurrent); or consent. Fall only. **DP**

**GG 399 Directed Reading (V)** Individual reading in geology and geophysics. Pre: 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. Pre: 302 and PHYS 272, or consent. (Alt. years) **DP**

**GG 402 Hawaiian Geology (3)** Consists of lectures, discussions, and field trips about the geology of the Hawaiian islands. Focus on geological processes and the geologic history of all islands will be covered. Pre: 302 and 303; or consent. **DP**

**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. Pre: 301 and 303; or consent. **DP**

**GG 410 Undergraduate Seminar (1)** Seminar format, examination of current research topics and methodologies in the field of Geology and Geophysics. Pre: 170 and 200.

**GG 420 Sea Levels, Ice Ages, and Global Change (3)** Recent 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 one time. Pre: 309 or consent. **DP**

**GG 421 Geologic Record of Climate Change (3)** This course explores the climatic responses of Earth's major systems and subsystems (ice, water, vegetation, land) and traces their interactions through geologic history. Open to nonmajors. A-F only. Pre: 200 or MET 310, OCN 310, OEST 310; or consent. **DP**

**GG 423 Marine Geology (3)** Sediments, structure, geophysics, geochemistry, history of

ocean basins and margins. Pre: 302 and 308; or consent. (Cross-listed as OCN 423) **DP**

**GG 425 Environmental Geochemistry (3)** Lecture course on theory and applications of geochemistry to contaminant/pollutant distribution in the Hydrosphere-Geosphere-Biosphere system. Topics include aqueous geochemistry, thermodynamics, kinetics, organic and isotope chemistry of environmental contaminants. Pre: 325 or consent. Fall only. **DP**

**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. Pre: 101, 103, or consent. (Alt. years) **DP**

**GG 444 Plate Tectonics (3)** Quantitative geometrical analysis techniques of plate tectonic theory; instantaneous and finite-rotation poles; triple-junction analysis; plate-boundary stresses. Pre: 200 or consent. **DP**

**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: 304 and 312, or consent. **DP**

**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: 304 or consent. (Alt. years) **DP**

**GG 454 Engineering Geology (3)** Solutions of engineering geology problems by geologists and engineers through recognition, characterization, evaluation, and assessment of geologic processes and geologic conditions that impact people, engineering structures, and engineering operations. Group format. Pre: junior or senior standing in geology and geophysics or civil and environmental engineering; or consent. **DP**

**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 242 or MATH 252A, or consent. **DP**

**GG 460 Geological Remote Sensing (4)** (3 Lec, 1 3-hr Lab) Combined lecture-lab course on the concepts behind, geologic uses for, and techniques of satellite and airborne remote sensing. Lab work will consist of computer image processing. Field trips. Open to nonmajors. Pre: 170, MATH 241 or MATH 251A (or concurrent), or consent. Spring only. **DP**

**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. **DP**

**GG 491 Teaching Geology (4)** For GG majors who lead, under supervision, a freshman seminar section of GG 170. Credit not applicable to major. Pre: 302, 303, and 309. **DP**

**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 244 or MATH 253A, PHYS 400, or consent.

**GG 601 Explosive Volcanism (3)** Explosive volcanic eruptions: from causes to consequences. Review of current physical volcanology including ascent and fragmentation of magma, transport and deposition processes in pyroclastic eruptions, volcanic crisis management and volcanic eruption scenario. Seven-day fieldtrip. A-F only. Pre: 300 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 or consent. (Alt. years)

**GG 605 Groundwater/Engineering Geology (2)** Selected topics. Repeatable. Pre: consent.

**GG 606 Current Events in Volcanology (1)** Discussion of active areas of volcanism and new publications on volcanology. Repeatable four times. CR/NC only. Pre: 300 (or concurrent) or consent.

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

**GG 609 Graduate Teaching Geology (V)** For GG graduate students who lead, under faculty supervision, a scheduled class in Geology and Geophysics. The instructor will define the student's responsibilities when offering GG 609, and these responsibilities must be met for a passing grade. As the consent to take the class must also be granted by the Department Chair, the Chair will also review the responsibilities required by the instructor. GG graduate students only. CR/NC only. Pre: Consent of instructor and Department Chair.

**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 615 Micropaleontology (3)** (2 Lec, 1 3-hr Lab) Taxonomy and identification of microfossils and their recent representatives. Use in determining age, paleoecology, provenance of sedimentary rocks. Pre: 308 or consent.

**GG 621 Electron Microprobe Analysis (2)** Combined lecture-lab course on the principles of geochemical analysis by electron microprobe and X-ray fluorescence. Hands-on experience with the electron microprobe. Required to operate the UH electron microprobe. Pre: 301 or consent.

**GG 625 Seminar in Marine Geology and Geophysics (V)** Current research topics. Repeatable. Pre: 423 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 243 or MATH 253A, and consent.

**GG 637 Macroevolution and Earth History (3)** Evolutionary biology in the context of Earth history; fossil record of life; fundamentals of microevolution; speciation, molecular evolution and phylogeny; geologic history of the Earth; evolution of genomes, development, and behavior; and case studies in evolution. A-F only Pre: BIOL 171 or equivalent. (Alt. years)

**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-atmospheric-sediment system and co-evolution of the biota. Repeatable one time. Pre: BS in environmentally related science or one year of chemistry, physics, and calculus; or consent. (Cross-listed as OCN 638)

**GG 639 Stable Isotope Biogeochemistry (3)** Stable isotope geochemistry applied to questions of biogeochemical cycling in the oceans, sediment diagenesis, paleoceanography, environmental geochemistry and ecology. Pre: 325 or consent. (Alt. years)

**GG 641 Origin of Sedimentary Rocks (3)** (2 Lec, 1 3-hr Lab) Environment 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) (Alt. years)

**GG 642 Elemental 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 242 or MATH 252A; and consent. (Cross-listed as OCN 644) (Alt. years)

**GG 650 Seismology (3)** Elasticity, wave equations, body waves, surface waves, free oscillations, seismometry, 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 flow 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. A-F only. Pre: CEE 627 or consent. Fall only. (Cross-listed as CEE 623)

**GG 656 Transport Modeling (3)** Introduction to the finite-element; transport of mass and heat in groundwater flow systems; applications to groundwater contamination. A-F only. Pre: CEE 623 or consent. Spring only. (Cross-listed as CEE 624) (Alt. years)

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

**GG 665 Current Readings in Planetary Science (1)** Review of current literature and research in planetary sciences; active student participation required. Repeatable. Pre: consent.

**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 667 Planetary Atmospheres: Origin and Evolution (3)** Atmospheres of terrestrial and Jovian planets. Emphasis on physical and chemical processes. Pre: consent.

**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 630, 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: 666 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. (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) petrology of the Moon and Mars. Pre: consent.

**GG 674 Paleooceanography (3)** Study of the paleooceanographic and paleoclimate evolution of the Earth's oceans, atmosphere and biosphere. Repeatable. Pre: consent. (Cross-listed as OCN 674) (Alt. years)

**GG 675 The Generic Mapping Tools (3)** Introduction to the Generic Mapping Tools (GMT). Processing of scientific data and the automated preparation of maps and illustrations using GMT on UNIX workstations, with introduction to UNIX and the C shell environment.

**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 Tarantola 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, MATH 241 or MATH 251A; 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 703 Fractures and Faults (3)** Lecture course on elasticity theory, fracture mechanics and boundary element modeling, with application to faults and fractures in the Earth. Pre: consent.

**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)**

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## Geriatric Medicine (GERI)

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*School of Medicine*

**GERI 541 Geriatric and Palliative Care (V)** This four-week rotation provides medical students with an overview of Geriatric and Palliative Medicine in outpatient, inpatient, home care and nursing home settings. Students will receive one half-day per week of Geriatric Medicine didactic seminars and one half-day per week of Palliative Medicine didactic sessions. The clinical placements will be provided at several teaching sites including Kuakini Medical Center, Queen's Medical Center, the VA, several nursing homes on Oahu, Kaiser Permanente, Hospice Hawaii, and the Pain & Symptom Management Program at Queen's Medical Center. CR/NC only.

**GERI 542 Geriatric Medicine Research (V)** Medical students will have the opportunity to complete a research project in the field of epidemiology of aging, and present an abstract at a local meeting. Basic principles of epidemiology and statistics will be taught. Repeatable one time. CR/NC only. Pre: departmental approval.

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**German (GER)**


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*College of Languages, Linguistics and Literature*

*All courses are conducted in German.*

**GER 101 Elementary German (3)** Conversation, grammar and reading. **HSL**

**GER 102 Elementary German (3)** Conversation, grammar and reading. Pre: 101 **HSL**

**GER 201 Intermediate German (3)** Conversation, grammar, reading and writing. Pre: 102. **HSL**

**GER 202 Intermediate German (3)** Conversation, grammar, reading and writing. Pre: 201. **HSL**

**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. **HSL**

**GER 260 Intensive Intermediate German Abroad (V)** Intensive course of formal instruction on the second-year level in German language and culture in Germany. Pre: 102. **HSL**

**GER 301 Phonetics and Pronunciation Practice (3)** Analysis of the German phonological system and practice in pronunciation. Pre: 202. **DH**

**GER 303 Reading and Writing (3)** Further development of reading and writing skills through the study of modern short stories by major German authors such as: Böll, Borchert, Frisch, Kafka, and Novak. Pre: 202. **DL**

**GER 304 Advanced German: Business and Related Fields (3)** Advanced German conversation, reading, and writing with a special emphasis on the vocabulary and cultural context of the German business world. Pre: 204.

**GER 305 Composition and Conversation (3)** Intensive practice in writing and speaking, with selected grammar review. Pre: 202 or consent.

**GER 306 Composition and Conversation (3)** Continuation of 305. Pre: 305.

**GER 307 German for Reading I (3)** Development of reading skills through the study of short scholarly, technical, and literary texts. Pre: 202 or consent.

**GER 308 German for Reading II (3)** Continuation of 307. Pre: 307 or consent.

**GER 312 Introduction to German Literature (3)** Representative reading and discussion of cultural periods in chronological order from c.1700; brief reference to earlier periods. Pre: 303 (or concurrent) with consent. **DL**

**GER 313 Introduction to German Literature (3)** Continuation of 312. Pre: 312 or approval of instructor. **DL**

**GER 360 Intensive Third-Level German Abroad (V)** Intensive course of formal instruction on the third-year level in German language and culture in Germany. Pre: 202 or 260.

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

**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). **DL**

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

**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. **DL**

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

**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. **DL**

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

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

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

**GER 414 German Literature from 1880 to 1950 (3)** Theater, prose, poetry exemplifying literary currents from naturalism to expressionism and Nullpunkt literature. Hauptmann, Rilke, Trakl, Kafka, Brecht, Böll, etc. Pre: 306 or consent. **DL**

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

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

**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 or consent. **DL**

**GER 450 The Structure of German (3)** Analysis of German phonology, syntax, and semantics. Pre: 301 and 306; or consent. **DH**

**GER 451 Introduction to the History of German Language (3)** Survey of important developments from beginnings to present. Pre: 301 and 306; or consent.

**GER 460 Intensive Fourth-Level German Abroad (V)** Intensive course of formal instruction on the fourth-level in German language and culture in a German-speaking country. Pre: 360 or equivalent.

**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 632 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 Novelle (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.

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**GG**


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*See Geology and Geophysics*

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**Greek (GRK)**


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*College of Languages, Linguistics and Literature*

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

**GRK 102 Elementary Greek (3)** Continuation of 101. Pre: 101. **HSL**

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

**GRK 202 Intermediate Greek (3)** Continuation of 201: emphasis on poetry. Pre: 201. **HSL**

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

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

**GRK 325 Greek Philosophy (3)** Selections from Plato, Aristotle, and others. Pre: 201 and 202, or consent. **DL**

**GRK 332 Greek Drama (3)** Selections from Aeschylus, Sophocles, and Euripides. Pre: 201 and 202, or consent. **DL**

**GRK 333 Greek Lyric (3)** Selections from Sappho, Alcaeus, and others. Pre: 201 and 202, or consent. **DL**

**GRK 490 Seminar in Greek Studies (3)** Study of an author or phase in Greek studies. Repeatable. Pre: any two 300-level GRK course, 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.

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## Hawaiian (HAW)

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*College of Languages, Linguistics and Literature*

**HAW 100 Language in Hawai'i: A Survival Kit for Life in Hawai'i (3)** Introduction to Hawaiian language and language related issues to enhance communicative experience in Hawai'i, including an examination of place names, pronunciation, common expressions, relation to Pidgin, Polynesian and Asian languages, political issues and intercultural conflict. DS

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

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

**HAW 105 Intensive Elementary Hawaiian (8)** Content of 101 and 102 covered in one semester. Meets two hours daily, Monday–Friday, plus lab work. HSL

**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. HSL

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

**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. HSL

**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. DL

**HAW 262 Hawaiian Literature (3)** Hawaiian tradition in Hawaiian text and English translation featuring the selected works of American missionaries and Hawaiian authors emphasizing the period following discovery (1778-79), into the nineteenth and early twentieth centuries. A-F only. Pre: 261. Spring only. DL

**HAW 284 Papa Mele I (Mele in the Hawaiian Language Classroom) (3)** The incorporation of mele and the performance thereof for the enhancement of second language acquisition in Hawaiian. Pre: 102.

**HAW 301 Third-Level Hawaiian (3)** Continuation of 202. Conducted in Hawaiian. Advanced conversation and reading. Pre: 202 or equivalent.

**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 345 Ulu ka Hoi (3)** Lecture course offering focused study and creation of Hawaiian language newspapers with a concentration on the characteristics of writing in this genre. Students will produce a monthly newsletter in Hawaiian. Repeatable one time. Pre: 302 (or concurrent) or consent. DH

**HAW 373 Ka Mo'omeheu 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. DH

**HAW 401 Fourth-Level Hawaiian (3)** Advanced reading, writing, and discussion in Hawaiian. Transcribing and translating Hawaiian language tapes. Translating English into Hawaiian, and Hawaiian into English. Pre: 302 or equivalent.

**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. DH

**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. DL

**HAW 427 I Le'a Ka Hula I Ka Ho'opa'a (Mo'olelo, Ka'ao, Mele and Hula) (3)** The incorporation of mele and hula performance with mo'olelo and ka'ao. Pre: 301 or consent.

**HAW 428 Ka Mana'o Politika Hawai'i - Political Thought in Hawaiian (3)** Intensive study of Hawaiian political thought in writing and speech. Pre: 302 (or concurrent) or consent. (Cross-listed as POLS 303 (C)). DH

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

**HAW 445 Na Politika ma ka Nuhou Hawai'i - Politics in Hawaiian Language Media (3)** Study of Hawaiian news media with emphasis on political content. Includes field trips to various archives. Pre: 302 (or concurrent); or consent. (Cross-listed as POLS 344) DH

**HAW 452 Structure of Hawaiian (3)** Descriptive linguistic analysis. Intensive exercises in advanced grammar. Pre: 302 (or concurrent) and LING 102, or consent. DH

**HAW 454 History of the Hawaiian Language (3)** Development from proto-Polynesian. Phonology, morphology, and grammar; history of research. Pre: 302 (or concurrent) and 452, or consent. DH

**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 Ho'omohala Ha'awina Kaiapuni Curriculum Development (3)** Examination of curricular issues of indigenous language programs; weekly participation in an immersion classroom; development of materials. Repeatable one time. Pre: 302 or consent.

**HAW 471 Teaching in Hawaiian Language Immersion Program (3)** Knowledge base for professional education; secondary school organization, curriculum, and instruction; individual and program goals. A-F only. Pre: 302 and consent.

**HAW 483 Papa Mele Wahi Pana (3)** Will provide students with the opportunity to learn mele, mainly poetry and song, composed specifically for a certain area of Hawai'i. 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. DL

**HAW 485 Haku Hanakeeka - Hawaiian Language Playwriting (3)** The creation and authoring of Hawaiian language play scripts based on traditional motifs. Repeatable one time. Pre: 402 (or concurrent) or consent. DA

**HAW 488 'Olelo No'eau (3)** Survey and analysis of traditional proverbs and their kaona or symbolic meanings. A-F only. Pre: 402 or consent. DH

**HAW 490 Ka Makau'olelo A'o Kula Kaiapuni Hawai'i (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.

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## Hawaiian, Asian and Pacific Islands (HAPS)

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*School of Hawaiian, Asian, and Pacific Studies*

**HAPS 099 Overseas Study (V)** Registration allows student to maintain enrolled status at UH Mānoa while taking courses abroad. CR/NC only. Pre: consent.

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## Hawaiian Studies (HWST)

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*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. DH

**HWST 207 Malama Ahupua'a: Resource Management (3)** Examination of the ahupua'a system: its mythologies, place names, history, poetry and early documents of the Hawaiian nation, as it was conceptualized by the ancient Hawaiians and exploration of its relevance in modern society. A-F only. Pre: 107.

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

**HWST 281 Ho'okele I: Hawaiian Astronomy and Weather (3)** An introduction to Hawaiian views of astronomy and weather, required as preparation for sailing Hokule'a in following semester. Restricted to majors. Repeatable one time. Pre: 107 or consent.

**HWST 281L Ho'okele I Laboratory (1)** (1 3-hr Lab) Stargazing laboratory to accompany 281. Pre: 281 or concurrent.

**HWST 282 Ho'okele II: Hawaiian Navigation (3)** Hawaiian canoe design, navigation, sailing dynamics for double hulled canoes, and sail planning. Restricted to majors. Repeatable one time. Pre: 281 or consent.

**HWST 282L Ho'okele II Laboratory (1)** (1 3-hr Lab) Sailing laboratory on double hulled canoe to accompany 282. Pre: 282 or concurrent.

**HWST 285 La'au Lapa'au I: Hawaiian Medicinal Herbs (V)** Presentation of Hawaiian medicinal herbs including basic philosophy, identification, utilization, and preparation of such herbs for human ailments. Pre: 107 or consent.

**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. **DH**

**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 Kumulipo 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, 341, 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. **DL**

**HWST 351 Mahi'ai Kalo I: Taro Cultivation (3)** Historical, cultural and philosophical foundations of the cultivation and uses of taro. A-F only. Pre: 107. Fall only.

**HWST 352 Mahi'ai Kalo II: Advanced Taro (3)** In depth-study of taro cultivation techniques and systems. A-F only. Pre: 351.

**HWST 362 Pana O'ahu: Famous Place Names (3)** A survey of the famous place names in each ahupua'a 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 365 Pana Paemoku o Kanaloa: The Northwestern Hawaiian Islands (3)** This course will look at the use of the Northwestern Hawaiian Islands during pre-contact times, the historical period of the Kingdom of Hawai'i, after the islands were ceded to the U.S., and the contemporary politics that surround the region today. A-F only. Pre: 107 or consent.

**HWST 385 La'au Lapa'au II: Advanced Medicinal Herbs (3)** Advanced study and preparation of Hawaiian medicinal herb combinations. Pre: 107 and 285; or consent.

**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. **DH**

**HWST 440 Mahele 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 441 Ceded Lands: Focus on Crown and Government Lands (1848 to Present) (3)** Inventorying "Ceded Lands" in Hawai'i with emphasis on historical, legal, and cultural changes from the Kingdom through statehood. A-F only. Pre: 440 or consent.

**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 457 'Aina Mauliolo: Hawaiian Ecosystems (3)** Comprehensive analysis of traditional Hawaiian and modern resource management practices. Rigorous overview of the dominant physical and biological processes from the uplands to the oceans in Hawai'i. Pre: 107, BOT 105, and junior standing; or consent. (Cross-listed as BOT 457)

**HWST 458 Natural Resource Issues and Ethics (4)** Overview of the history of land, resources and power in Hawai'i; players and processes influencing land and natural resources policies today explored from Native Hawaiian and other viewpoints. Extensive use of case studies. Pre: 457 or BOT 457.

**HWST 459 Strategies in Hawaiian Resource Use (3)** Analyzing diverse land and water use strategies of O'ahu, from traditional Hawaiian, scientific and economic perspectives, through classroom and on-site lectures. Topics include traditional Hawaiian methods, modern development, threatened ecosystems, eco-tourism and scientific research. A-F only. Pre: BOT/ HWST 457 (or concurrent) or consent. (Cross-listed as BOT 459)

**HWST 460 Hui Konohiki Practicum (3)** A "hands-on" internship in an environmental or resource-management organization in Hawai'i. The experience will be broadened and supplemented by classroom lectures, discussion and analysis from traditional Hawaiian, scientific and economic perspectives. A-F only. Pre: BOT/ HWST 457, BOT/HWST 458 (or co-requisite), BOT/HWST 459; or consent. Spring only. (Cross-listed as BOT 460)

**HWST 478 Mele Au Hou: Music and Native Identity (3)** Presents Hawaiian music as it has been an avenue for native social, cultural and political expression in traditional and contemporary society. A-F only. Pre: 107 or 343 or 390; or consent.

**HWST 485 Mahi La'au Lapa'au: Hawaiian Medicinal Horticulture (4)** The science of planting and harvesting Hawaiian medicinal plants and exploring production and marketing strategies. Pre: 107, 285 and 385; or consent.

**HWST 487 Hawaiian Aquatic Medicine (4)** Course in identification, extraction and preparation of complexes of aquatic herbs to formulate a healing combination to contribute to maintaining overall health. A-F only. Pre: 107, 285 or consent. Fall only.

**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 494 Modern Pacific Women's Poetry (3)** Critical examination of modern indigenous women's poetry from the Pacific Islands. Thematic concentration on land, family, sexual and national oppression. Pre: any two of the following (second may be taken concurrently): ENG 250, ENG 251, ENG 252, ENG 253, ENG 254, ENG 256, ENG 257; or consent. (Cross-listed as ENG 479) **DL**

**HWST 495 Kumu Kanawai: Western Law and Hawai'i (3)** The rise of Western law in Hawai'i, its contribution to nation building and colonialism. Pre: 342 or 343 or 390; or consent.

**HWST 496 Kanawai II: Practical Application of Rights (3)** Historical analysis of land use, race and self-determination; introduced to legal case briefing, analysis of legal precedent, practical impacts of rules and regulations and the socio-political factors that influence law and law enforcement. A-F only. Pre: 390 or consent.

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

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## Health, Physical Education, and Recreation (HPER)

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See *Kinesiology and Leisure Sciences*

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## Health Sciences and Social Welfare (HSSW)

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*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.

**HSSW 651 Interdisciplinary Team Development (V)** Theory, process, and practice of interdisciplinary team development related to community health care. Pre: graduate or senior standing in health-related field, or consent.

**HSSW 680 Public Policy and the Elderly (3)** Social, political, and economic antecedents and consequences of current policy. Distribution of public benefits. Elderly vis-à-vis other interest groups; distribution of benefits within the elderly population. Pre: consent and graduate standing.

## Hebrew (HEB)

*College of Languages, Linguistics and Literature*

*Students choosing Hebrew for the language requirement should realize it may not be offered if demand is limited.*

**HEB 101 Elementary Hebrew (3)** Conversation, grammar, reading and writing. Fall only. Pre: consent.

**HEB 102 Elementary Hebrew (3)** Conversation, grammar, reading and writing. Spring only. Pre: 101 or consent.

**HEB 201 Intermediate Hebrew (3)** Conversation, grammar, reading and writing. Fall only. Pre: 102 or consent.

**HEB 202 Intermediate Hebrew (3)** Conversation, grammar, reading and writing. Intro to biblical Hebrew. Spring only. Pre: 201 or consent.

## Hindi (HNDI)

*College of Languages, Linguistics and Literature*

**HNDI 101 Elementary Hindi (4)** Listening, speaking, reading, writing. Structural points introduced inductively. Meets five hours weekly; daily lab work. **HSL**

**HNDI 102 Elementary Hindi (4)** Continuation of 101. **HSL**

**HNDI 201 Intermediate Hindi (4)** Continuation of 102. Meets five hours weekly; daily lab work. Pre: 102 or equivalent. **HSL**

**HNDI 202 Intermediate Hindi (4)** Continuation of 201. **HSL**

**HNDI 301 Third-Level Hindi (3)** Continuation of 202. Conversation and advanced reading. Pre: 202 or equivalent.

**HNDI 302 Third-Level Hindi (3)** Continuation of 301.

## History (HIST)

*College of Arts and Humanities*

**HIST 151 World History to 1500 (3)** Historical narratives and global perspectives on human societies and cross-cultural interactions from prehistory to 1500; includes ways to think about the past and ways to use primary sources. **FG**

**HIST 152 World History since 1500 (3)** Continuation of 151. Historical narratives and global perspectives on human societies and cross-cultural interactions from 1500 to present;

includes ways to think about the past and ways to use primary sources. **FG**

**HIST 155 Issues in World History (3)** In examining aspects of the histories of Africa, Asia, the Americas, Europe and Oceania, this course highlights the myriad ways in which global contact has transformed our world and narratives of the past. **FG**

**HIST 161A World Cultures in Perspective (3)** Development of civilizations from prehistoric origins to 1500. Offered as discussion and/or problems course. Alternative for 151 and 152; freshmen in SSP only. **FG**

**HIST 162A World Cultures in Perspective (3)** Continuation of 161A. Development of civilization from 1500 to the present. Offered as discussion and/or problems course. Alternative for 151 and 152; freshmen in SSP only. **FG**

**HIST 231 European Civilization 1500-1800 (3)** Political evolution and major economic, social, and cultural development of European states. 1500-1800. **DH**

**HIST 232 Modern European Civilization 1800- (3)** Continuation of 231. Major political, social, economic, and cultural trends from Napoleon to the present. **DH**

**HIST 241 Civilizations of Asia (3)** Survey of major civilizations of Asia from earliest times to 1500; East Asia, Southeast Asia, South Asia. (Cross-listed as ASAN 241) **DH**

**HIST 242 Civilizations of Asia (3)** Continuation of 241. Survey of major civilizations of Asia from 1500 to the present; East Asia, Southeast Asia, South Asia. (Cross-listed as ASAN 242) **DH**

**HIST 281 Introduction to American History (3)** Interpretive survey from earliest settlement to 1865. A-F only. **DH**

**HIST 282 Introduction to American History (3)** Interpretive survey from 1865 to the present. **DH**

**HIST 284 History of the Hawaiian Islands (3)** Survey of state and local history from Polynesian chiefdoms to Hawaiian Kingdom to American territory and state. **DH**

**HIST 288 Survey of Pacific Islands History (3)** Survey of Pacific Islands from pre-colonial to modern times; early settlement, cultural contact, colonization, contemporary problems. **DH**

**HIST 294 History of the Philippines (3)** The course traces developments in Philippine history and society from precolonial to contemporary times and explores ways in which the peoples of the Philippines embraced, resisted or negotiated new modes of thought, behavior and social organization influenced by the Spanish, American, and Japanese regimes as well as the post-colonial global order. **DH**

*Upper-division standing or consent is a prerequisite to all history courses numbered above 300.*

**HIST 301 History of India and Pakistan (3)** Historical survey of Indian society, economics, politics, religion, ideas, and institutions; origins, development, influence on culture, to 1500. **DH**

**HIST 302 History of India and Pakistan (3)** Continuation of 301. 1500 to the present. **DH**

**HIST 305 History of Southeast Asia (3)** Survey of development of civilizations and growth of nations in Southeast Asia, to the 18th century. **DH**

**HIST 306 History of Southeast Asia (3)** Continuation of 305, from 18th century to the present. **DH**

**HIST 309 East Asian Civilizations (3)** Characteristics of East Asian civilizations as they developed in pre-modern China; variant patterns in Japan and Korea; the modernization process to 1500. **DH**

**HIST 310 East Asian Civilizations (3)** Continuation of 309. Period after 1500. **DH**

**HIST 311 History of China (3)** Chinese civilization to the 17th century. **DH**

**HIST 312 History of China (3)** Continuation of 311. Period since the 17th century. **DH**

**HIST 321 History of Japan (3)** Survey of culture, government, economics, and institutions, to 1700. **DH**

**HIST 322 History of Japan (3)** Continuation of 321. Period from 1700. **DH**

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

**HIST 324 The Samurai of Japan (3)** A social, military, and cultural history of Japan's samurai (warrior) class. **DH**

**HIST 327 History of Korea (3)** Survey of political, economic, social, and cultural developments from earliest times to 1400. **DH**

**HIST 328 History of Korea (3)** Continuation of 327. From 1400 to the present. **DH**

**HIST 331 Ancient Greece I (3)** Political, social, and cultural history of the Minoan, Mycenaean, and Archaic periods. **DH**

**HIST 332 Ancient Greece II (3)** Political, social, and cultural history of the Classical and Hellenistic periods. **DH**

**HIST 333 Ancient Rome: The Republic (3)** Political, social, cultural history from the Etruscans to Augustus. Emphasis on discussion of literary and archaeological materials. (Alt. years: fall) **DH**

**HIST 334 Ancient Rome: The Empire (3)** Political, social, and cultural history from Augustus to 476 A.D. Emphasis on literary and archaeological materials. (Alt. years: spring) **DH**

**HIST 335 Early Middle Ages 300-900 (3)** Interaction of three major forces forming Western European civilization: Classical tradition, Christian religion, Germanic society. **DH**

**HIST 336 High Middle Ages 900-1300 (3)** Topical examination of Medieval European culture: economy, society, religion, politics, thought, and the arts. **DH**

**HIST 337 European Intellectual History (3)** Undergraduate seminar on great debates in Western thought. Discussion of primary source materials; the scientific revolution and Enlightenment. **DH**



- HIST 338 European Intellectual History (3)** Continuation of 337. European thought from French Revolution to the present. **DH**
- HIST 340 Comparative Economic Growth—Historical Perspective (3)** Comparative historical studies of economic development since 1750 in Great Britain, France, Germany, Russia, U.S., China, Japan, and the European common market. Political, social, and cultural dimensions. **DH**
- HIST 344 Modern Germany (3)** Political, social, economic, and cultural history since 1547. Rise of Austria and Prussia, unification, Bismarckian era, World War I and Weimar Republic, Hitler's Third Reich, post-World War II. **DH**
- HIST 345 France in the Old Regime (3)** Major social, political, and intellectual developments: Renaissance, Reformation, religious wars, Richelieu, Louis XIV, Enlightenment, and Revolution. **DH**
- HIST 346 Modern France (3)** Political, social, economic, and intellectual developments from Revolution and Napoleon to the present. **DH**
- HIST 347 Tudor-Stuart Britain (3)** This course traces major developments in British politics, society, and culture between the late Medieval and Modern Eras. **DH**
- HIST 348 Modern England (3)** Interaction of 17th-, 18th-, and 19th-century intellectual, political, economic, and social changes, which together produced the British Empire and modern Britain. **DH**
- HIST 349 British Empire (3)** Origins and expansion of the British empire between the seventeenth and twentieth centuries. Includes imperial policies affecting Britain, Australia, India, Ireland, and Southern Africa. Open to nonmajors. **DH**
- HIST 350 Introduction to Russian History and Civilization (3)** Development of Russia as a unique society. Origins and outside influences; rise of Moscow; autocratic system and serfdom; Western impact and modernization; artistic and literary heritage; Revolutionary movement and 1917 Revolution; Soviet Union. **DH**
- HIST 354 Introduction to Islamic History (3)** Muhammad, the Arab conquests, the Caliphate; fundamentals of Islam; classical Islamic civilization; development of Islam into modern times with emphasis on the Middle Eastern heartland. **DH**
- HIST 355 The Making of the Modern Middle East (3)** Survey of developments that created the system of nation-states in the Middle East. History of the Ottoman Empire and the Republic of Turkey; Egypt; the Arab world; Israel and Iran. Recommended: 354. **DH**
- HIST 356 Survey of African History (3)** The history of Africa from earliest times to the present: the rise of indigenous civilizations, European and Muslim impact, colonialism and nationalism, and current issues. **DH**
- HIST 358 The World of Mekong (3)** Historical survey, from BC period to present, of the peoples of the Mekong region, an area covering southwestern China, Thailand, Cambodia, Laos, and southern Vietnam. Open to nonmajors. Pre: upper division standing or consent. **DH**
- HIST 360 U.S. Women's History to 1890s (3)** A survey of history of U.S. women and gender relations up to 1890s. Emphasis on women's labor, women's involvement in social movement, development of suffrage movement, women's literary and popular culture. Pre: AMST 201, AMST 201A (or concurrent) or AMST 202, AMST 201A (or concurrent) or WS 151, WS 151A (or concurrent), or consent. (Cross-listed as AMST 315 and WS 310) **DH**
- HIST 361 U.S. Women's History Since 1890s (3)** A survey of history of U.S. women and gender relations since 1890s. Emphasis on social reform, suffrage and the New Woman, women's wartime labor, gender and the Cold War, second wave feminism, divisions among women. Pre: AMST 201, AMST 201A (or concurrent) or AMST 202, AMST 201A (or concurrent) or WS 151, WS 151A (or concurrent), or consent. (Cross-listed as AMST 316 and WS 311) **DH**
- HIST 371 U.S. Foreign Relations to 1920 (3)** Survey of American foreign relations from initial encounters between Europeans and Native Americans through World War I. **DH**
- HIST 372 U.S. Foreign Relations Since 1920 (3)** American foreign relations from the end of World War I to the end of the Cold War. **DH**
- HIST 373 American Thought and Culture (3)** Politics, family, philosophy, technology, etc.; their interrelationship within the total society. Pre-Colonial to end of the 19th century. (Cross-listed as AMST 343) **DH**
- HIST 374 American Thought and Culture (3)** Continuation of 373: the 20th century. (Cross-listed as AMST 344). **DH**
- HIST 375 The American City (3)** Evolution since 17th century; role in contemporary American culture. Related problems, perceptions, values. (Cross-listed as AMST 321) (Alt. years: spring 98) **DH**
- HIST 378 History of American Business (3)** The evolution of business enterprise from colonial times to the present. Emphasis on entrepreneurship, technological change, labor-management relations, government-business relations, and economic thought. Case studies of industrial development. (Cross-listed as MGT 348). **DH**
- HIST 379 American Empire (3)** Examines the interplay between an "American culture of empire" and the rise of the United States as a superpower. Topics: imperialism and political culture, social movements and international affairs, race, gender and class relations. (Cross-listed as AMST 365) **DH**
- HIST 391 History of Warfare (3)** Classical and guerrilla warfare, revolution, and military systems and institutions. **DH**
- HIST 392 History of Warfare (3)** Continuation of 391, from 1850 to present. **DH**
- HIST 393 U.S. Military History (3)** Survey of development of American military forces from War of Independence to war in Vietnam. **DH**
- HIST 394 History of Science to 1700 (3)** Evolution of scientific thought and its cultural context. Antiquity to 1700. **DH**
- HIST 395 History of Science Since 1700 (3)** Continuation of 394; science, technology, and society since 1700. **DH**
- HIST 396 (Alpha) Introduction to the Study of History (3)** Introduction to the discipline; current trends in Asian, European, American, and Pacific historiography; preparation for senior thesis (496). (B) Historiography; (C) Education. Pre: history major or consent.
- HIST 403 Vietnam: History and Memory (3)** Survey of Vietnamese history with particular attention to the multiple ways that the Vietnamese past has been remembered and represented by different peoples. Open to non-majors. Pre: upper division standing and/or consent. **DH**
- HIST 406 Modern Philippines (3)** Survey of major developments from pre-colonial through Spanish and American colonial periods, the revolution, Japanese occupation, and post-war republic. **DH**
- 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. **DH**
- 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. **DH**
- HIST 410 Twentieth-Century China (3)** An examination of the political, intellectual, economic, cultural, and social transformations of China in the twentieth century. This lecture course studies critical events in the making of modern China and explores important issues in the modernization of Chinese life in the twentieth century. **DH**
- HIST 411 Local History of Late Imperial China (3)** Ch'ing government and Chinese society from local and regional perspectives; modes of control and disorder during the 19th century. **DH**
- 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. **DH**
- 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. **DH**
- 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. **DH**
- 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. **DH**
- HIST 419 The Chinese Revolution (3)** Origins, development, and meaning of modern revolution in China, 19th century to People's Republic. Recommended: 311 and 312. **DH**
- 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. **DH**

**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. **DH**

**HIST 422 Tokugawa Japan (3)** Japanese history and culture, 1600–1867. Recommended: 321. **DH**

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

**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. **DH**

**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. **DH**

**HIST 431 Ancient Near East: Pyramids and Writing Tablets (3)** Civilizations of the Sumerians, Babylonians, Assyrians, ancient Egyptians, Hittites, Hebrews, and Achaemenid Persians. Emphasis on discussion of literary and archaeological materials. **DH**

**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, revolutions in the Arab countries, the Turkish experiment with secularism, the Iranian/Islamic revolution, Afghanistan, the Gulf War. Recommended: 354 or 355. **DH**

**HIST 433 Medieval Cultures (3)** Topical study of cultural and cross-cultural issues in the medieval period (circa 300–1500). 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 one time. **DH**

**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. (Alt. years: spring 2000) **DH**

**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 97) **DH**

**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 social and political developments. (Alt. years: spring) **DH**

**HIST 439 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 BIOL 101, BOT 101 or ZOOL 101; or consent. **DH**

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

**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) **DH**

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

**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 nonmajors. **DH**

**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. **DH**

**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. **DH**

**HIST 452 History and Film (3)** Lecture/discussion course introducing relationships between film and history. Explores how film reflects and shapes society, influences our sense of the past, and provides a way to understand that past. Considers historical issues since the French Revolution. Open to nonmajors. **DH**

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

**HIST 454 Tsarist Russia (3)** Development of the Russian state to the 19th century. Kievan state 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. **DH**

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

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

**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. **DH**

**HIST 460 Native American History (3)** A lecture and discussion course on the history of North American Indians from the seventeenth century to the present. Open to nonmajors. **DH**

**HIST 461 Early America (3)** Lecture/discussion on Native Americans, Africans, and Europeans in North America from contact to independence. Social, cultural, and economic themes and intersections of race, class, and gender explored. **DH**

**HIST 462 The Young American Republic 1783–1841 (3)** Development of American

society, the Constitution, Jeffersonianism, the age of Jackson. **DH**

**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. **DH**

**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. **DH**

**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. **DH**

**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. **DH**

**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. **DH**

**HIST 468 Viva Las Vegas! (3)** Upper-division lecture course on the historical and cultural significance of Las Vegas in twentieth-century America. Open to nonmajors. **DH**

**HIST 470 American Show Business (3)** History of American entertainment industry since 1880, with emphasis on businesses of recording, broadcasting, and film production. Role of entrepreneurs, invention, labor, politics, and culture. Impact of industry on American life. Pre: consent. **DH**

**HIST 471 Music, Industry, and Society (3)** History of U.S. music and recording industry. How industry relates to economy as a whole, and how it reflects broad patterns and trends in American culture and society. Pre: Upper division standing and/or consent. (Cross-listed as MUS 440) **DH**

**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. **DH**

**HIST 473 Slavery (3)** Examines the origins, practices, and historical evolution of slavery from the 18th to the 20th century. Considers diverse forced labor regimes: chattel slavery, plantation agriculture, convict labor, "wage slavery," and patriarchal domination. (Cross-listed as AMST 432) **DH**

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

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

**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) **DH**

**HIST 478 Colonial Latin America (3)** Pre-Columbian civilizations: Spanish and Portuguese colonization; political, economic, social, and religious evolution to 1810; independence. (Cross-listed as LLEA 468) **DH**

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

**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. **DH**

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

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

**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. **DH**

**HIST 485 History of 20th-Century Hawai'i (3)** Formation of an American Hawai'i with its unique local culture from 1898 to the present. Pre: 284. **DH**

**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. **DH**

**HIST 492 Women and Revolution (3)** Conditions under which women's activism and participation in protest and revolutionary movements developed in the 19th- and 20th-centuries. Cross-cultural comparisons. (Cross-listed as WS 492) **DH**

**HIST 495 (Alpha) History Colloquium (3)** Extensive or intensive treatment of special problems. (B) Philippines and Indonesia; (C) U.S. foreign relations; (D) history in Oceania; (E) Chinese traditional government. Recommended for honors students. Pre: 372 (or concurrent) or consent for (C); consent for (B) and (E). **DH**

**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) 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—feudalism, economic 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: 335 or 336, 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 one time. 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 630 History of American History (3)** Graduate-level survey of American history, historians, historiography, and historical literature. Pre: graduate standing.

**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 635 Research: Teaching America's Past (3)** Research and writing seminar focusing on the relation of archival research and classroom instruction. Repeatable one time. Pre: graduate standing 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) foreign relations; (E) the American city (Cross-listed as

AMST 627 and ARCH 627); (F) the West (Cross-listed as AMST 614); (K) business, labor, and technology (Cross-listed as AMST 647). Repeatable one time for (C). A-F only for (C) and (F). Pre: graduate standing and consent.

**HIST 654 Seminar: Mainland Southeast Asia (3)** Studies in the histories of peoples and states of Myanmar, Thailand, Cambodia, Laos, and Vietnam. Repeatable. Pre: 306.

**HIST 655 Seminar: Island Southeast Asia (3)** Research and readings in the socioeconomic, political, and cultural history of Indonesia, Malaysia, and Philippines. Repeatable.

**HIST 656 Topics in Southeast Asia (3)** Reading and research seminar on themes about the past and present of Southeast Asia in a comparative framework. Pre: 305 or 306 or consent.

**HIST 657 Historiography of Southeast Asia (3)** Examination of contested boundaries of Southeast Asia, the various historiographic traditions, the colonial legacy, and the current issues emerging from a dialogue of historians from the "region" and the outside world. Repeatable one time.

**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 676 Pacific History Research Seminar (3)** Writing Pacific history from primary sources in Hawaiian repositories. Repeatable. Pre: 675.

**HIST 677 Seminar in History of Hawai'i (3)** Reading seminar with short papers required. Covers Kingdom of Hawai'i and 20th-century Hawai'i in alternate years. Pre: 284. Repeatable. (Alt. years: fall)

**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.

**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 713 Chinese Historical Literature (3)** Reading and use of numerous genres of Chinese historical literature and documents. Chinese bibliography. Knowledge of Chinese required. Repeatable.

**HIST 717 Chinese Intellectual History (3)** Intensive study in Chinese thought and institutions. Repeatable. Pre: 311 and 312. Recommended: knowledge of Chinese.

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

**HIST 721 China: Classic Antiquity to 750 (3)** Foundations and elaborations of Chinese tradition. Repeatable. Pre: 311 and 312.

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

**HIST 725 Contemporary China Seminar: Reading (3)** Topical readings, research, and discussion, emphasizing PRC. Normal sequence emphasizes reading in 725, research in 726. Repeatable.

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

**HIST 790 Teaching History (1)** HIST 151-152 faculty supervisors mentor their Teaching Assistants who teach the discussion labs. Course addresses issues of teaching strategy, grading and historical content. Enrollment limited to current Teaching Assistants in the World History Program. Repeatable 7 times. A-F only. Pre: History graduate Teaching Assistants assigned to 151-152.

**HIST 800 Dissertation Research (V)** Pre: consent.

## Honors (HON)

### Honors Programs

*These courses are limited to students in the Honors Programs.*

**HON 101 First-Year Honors Experience I: Mānoa Campus and Its Neighborhoods (3)** Freshman course with built-in peer mentoring

and advising to facilitate transition to university. Focus on the disciplined inquiry of research process fosters collaborative and engaged learning, critical thinking, library skills. Lecturers, discussions, workshops, fieldtrips. A-F only. Fall only.

**HON 102 First-Year Honors Experience II: Research at Mānoa (1)** Familiarizes students with university researchers and research facilities; focus on the ethical, moral and social dimensions involved in conducting research. Guest lectures on current research, field trips to labs and research institutes. Discussion of social policies. A-F only.

**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 190 Honors Tutorial (V)** Supplements a 100 or 200 lecture course or standard lab time with discussion section, instructor-intensive lab time or directed research. Limited enrollment. Repeatable one time.

**HON 291 (Alpha) Sophomore Seminar (3)** Special topics for lower-division honors students in seminar format. Development of critical thinking skills emphasized. (B) Biological Science; (H) Humanities; (P) Physical Science; (R) Arts; (S) Social Science; (T) Literature. Repeatable 2 times. A-F only. Pre: ENG 100 or ENG 100A or departmental approval. (B) **DB**; (H) **DH**; (P) **DP**; (R) **DA**; (S) **DS**; (T) **DL**

**HON 301 Research and Public Policy (3)** A disciplined inquiry on issues of ethical principle or public policy. Students will learn the research process by engaging in it: finding resources, using these resources critically, exploring implications suggested by the issues and resources and communicating their results in a precise and effective manner. Repeatable one time. A-F only.

**HON 380 Peer Monitoring (V)** Students function as peer mentors in and out of class sessions. Emphasis on understanding dynamics of leadership skills within the context of small groups. Pre-semester training sessions, on-going training and supervision. Repeatable one time. A-F only. Pre: 101 or departmental approval.

**HON 491 Junior 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. Limited to candidates for Honors degree. CR/NC only.

**HON 493 Senior Honors Thesis (2)** Preparation of research paper under individual faculty supervision. Limited to candidates for Honors degree. Repeatable in different major. A-F only.

**HON 494 Senior Honors Thesis (2)** Preparation of research paper under individual faculty supervision. Limited to candidates for Honors degree. Repeatable in different major. A-F only. Pre: 493.

**HON 495 Introduction to Research (3)** Library research skills; lectures on research within a university setting; methodological issues

for and across disciplines; special attention to defining a specific research problem. Limited to candidates for the Honors degree. CR/NC only.

**HON 496 Senior Honors Project (3)** Preparation of a research project or a performance project (with a research component) supervised by a faculty member. Limited to candidates for Honors degree. Repeatable one time for each major. A-F only. Pre: 495 or consent.

*Selected Studies students also have the option of taking A-section courses from the following list when they are offered by departments:*

- **AH 100A Introduction to the Arts**
- **AMST 201A The American Experience**
- **AMST 202A Diversity in American Life**
- **AMST 211A Contemporary American Issues: Domestic**
- **AMST 212A Contemporary American Issues: World**
- **ART 101A Introduction to Visual Arts**
- **ASAN 241A Civilizations of Asia**
- **ASAN 242A Civilizations of Asia**
- **ASTR 110A Survey of Astronomy**
- **ASTR 120A Astronomical Origins**
- **BOT 101A General Botany**
- **CHEM 181A Honors General Chemistry**
- **ECON 120A Introduction to Economics**
- **ECON 130A Principles of Economics**
- **ECON 131A Principles of Economics**
- **ECON 300A Intermediate Economics: Macroeconomics Analysis**
- **ENG 100A Composition I**
- **ENG 250A American Literature**
- **ENG 251A British Literature to 1800**
- **ENG 252A British Literature after 1800**
- **ENG 253A World Literature to 1600**
- **ENG 254A World Literature after 1600**
- **ENG 255A Short Story and Novel**
- **ENG 256A Poetry and Drama**
- **ENG 257A Themes in Literature**
- **ES 101A Introduction to Ethnic Studies**
- **GG 101A Introduction to Geology**
- **HWST 107A Hawai'i: Center of the Pacific**
- **HIST 161A World Cultures in Perspective**
- **HIST 162A World Cultures in Perspective**
- **HIST 241A Civilizations of Asia**
- **HIST 242A Civilizations of Asia**
- **HIST 281A Introduction to American History**
- **HIST 282A Introduction to American History**
- **ICS 101A Tools for the Info Age**
- **ICS 111A Introduction to Computer Science**

- ICS 2111A Introduction to Computer Science II
- IS 291A Community Service Practicum
- LIS 100A Computer & Information in Arts & Humanities
- LING 102A Introduction to the Study of Language
- MATH 100A Survey of Mathematics
- MATH 251A Accelerated Calculus I
- MATH 252A Accelerated Calculus II
- MATH 253A Accelerated Calculus III
- MICR 140A Microbiology Laboratory
- MUS 106A Introduction to Music Literature
- PHIL 100A Introduction to Philosophy: Survey of Problems
- PHIL 101A Introduction to Philosophy: Morals and Society
- PHIL 102A Introduction to Philosophy: Asian Traditions
- PHIL 110A Introduction to Logic
- PHYS 170A General Physics I
- PHYS 272A General Physics II
- POLS 110A Introduction to Political Science
- REL 151A Religion and the Meaning of Existence
- SOC 100A Introduction to Sociology
- SOC 218A Introduction to Social Problem
- SP 151A Personal and Public Speech
- SP 251A Principles of Effective Public Speaking
- WS 151A Introduction to Women's Studies

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## HPER

See *Kinesiology and Leisure Sciences (KLS)*

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## HSSW

See *Health Sciences and Social Welfare*

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## Human Resources Management (HRM)

*College of Business Administration*

- HRM 200 Career Development (1)
- HRM 351 Human Resource Management (3)  
Survey of the field covering recruitment, selection, training, appraisals, grievance handling, communications, discipline, safety, compensation, and benefits.
- HRM 353 Leadership and Group Dynamics (3)  
Develop understanding of theory and research on managerial, entrepreneurial leadership and creativity in organizations. Topics

include leadership, decision making, motivation, personality, and rewards within group settings.

**HRM 354 Organizational Change and Effectiveness (3)** Identify and evaluate methods to promote an effective change transition through efficient integration of corporate goals with the organizational culture.

**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 453 Personnel Compensation (3)** Selected topics. Emphasis on trends, recent issues, job evaluation, incentive systems, salary administration, executive compensation, profit sharing, benefit programs, retirement plans. Pre: 351.

**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 Human Resource Management (3)** Analysis and critical evaluation of basic issues, policies, and trends in personnel administration.

**HRM 664 Training and Development (3)** Covers issues in design, delivery, and assessment of training, theoretical background of training and development process, types of training process, cross cultural and other types of diversity training and development of training modules. A-F only.

**HRM 665 Compensation (3)** Survey of compensation methods and procedures including job evaluations, incentive systems, salary administration, fringe benefits, appropriate legislation, policies and strategy issues of compensation systems. A-F only.

**HRM 666 Health, Safety, and Security (3)** This course is concerned primarily with the safety and mental health management process which is a complex activity requiring experts from many disciplines such as industrial hygiene, occupational medicine and safety engineering, safety legislation is covered. A-F only.

**HRM 667 The Staffing Process (3)** Recruiting and selection to optimize organizations including job design, job analysis, recruitment and selection methods, such as types of interviews and assessment centers, within legislative environment. A-F only.

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## HWST

See *Hawaiian Studies*

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## Ilokano (ILO)

*College of Languages, Linguistics and Literature*

**ILO 101 Beginning Ilokano (4)** Listening, speaking, reading, writing. Structural points introduced inductively. Meets four hours weekly; daily lab work. **HSL**

**ILO 102 Beginning Ilokano (4)** Continuation of 101. Pre: 101 or consent. **HSL**

**ILO 107 Ilokano for Health Sciences (3)** Development of listening, speaking, reading, writing and other communication skills designed specifically for Nursing, Dentistry, Dental Hygiene, Public Health and Social Work students. Culture integrated with language study.

**ILO 111 Intensive Elementary Ilokano (6)** Listening, speaking, reading, writing. Structural points introduced inductively. Intensive vocabulary development and basic conversation. **HSL**

**ILO 112 Intensive Elementary Ilokano (10)** **HSL**

**ILO 201 Intermediate Ilokano (4)** Continuation of 102. Meets four hours weekly; three of four hours devoted to drill and practice. Pre: 102 or consent. **HSL**

**ILO 202 Intermediate Ilokano (4)** Continuation of 201. Pre: 201 or consent. **HSL**

**ILO 212 Intensive Intermediate Ilokano (10)** **HSL**

**ILO 301 Third-Level Ilokano (3)** Continuation of 202. Conversation, advanced reading, composition. Meets three times weekly. Pre: 202 or equivalent.

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

**ILO 315 Ilokano Aural Comprehension (3)** Training in listening comprehension of different authentic and simulated materials as presented in documentaries, soap operas, radio and television news and other broadcasts, formal lectures, plays, natural conversations, songs, and student-created sitcoms and dramas. Pre: 202 or consent.

**ILO 331 Contemporary Ilokano Literature (3)** Conducted in Ilokano, this course explores the literary landscape of Ilokano literature from the perspective of Ilokano writers based in the Philippines as well as those outside of the country. Pre: 301 or consent.

**ILO 401 Fourth-Level Ilokano (3)** Continuation of 302. Conducted in Ilokano. Advanced reading, writing, and conversation. Contemporary Ilokano literature; cultural and historical topics. Pre: 302 or equivalent.

**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.

**ILO 425 Ilokano Interpretation Field Practicum (3)** This course will provide extensive practical training in consecutive, simultaneous, sight and telephonic interpreting. It requires observation and study of interpretation strategies and techniques in relevant situations. Pre: 301 or consent.

**ILO 451 Structure of Ilokano (3)** Introduction to phonology, morphology, and syntax. Pre: 202 or consent. **DH**

## 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, Asilulu, Avestan, Balinese, Javanese, Malaysian, Old Persian, Sudanese, 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. Pre: 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. Contact hours and credits determined by student interests and faculty resources. Repeatable up to 8 credit hours. Pre: consent.

**IP 201 Directed Intermediate Language Study (4)** Continuation of 102. Pre: consent.

**IP 202 Directed Intermediate Language Study (4)** Continuation of 201.

**IP 261 Topics in Indo-Pacific Literature/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. Pre: consent.

**IP 273 (Alpha) Introduction to Indo-Pacific Language and Culture (3)** Introduction in English to language(s) and culture(s) of Indo-Pacific country or region. (B) Indian; (C) Southeast Asian; (D) Polynesian; (E) Philippines. Pre: 101 and 102 courses in relevant language or consent. **DH**

**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. Pre: at least 6 credit hours of elementary study in the same language.

**IP 301 Directed Third-Level Language Study (3)** Continuation of 202. Pre: consent.

**IP 302 Directed Third-Level Language Study (3)** Continuation of 301.

**IP 361 Southeast Asian Literature in Translation (3)** Survey in English of traditional and modern literatures of Southeast Asia. (Cross-listed as ASAN 361) **DL**

**IP 362 Philippine Drama: History, Art, Culture (3)** Historical survey from precolonial to contemporary periods. Studies forms, conventions, and literature within the social, political, and cultural context of the times as reflected in the history of Philippine drama. Explores plays in the diaspora. A-F only. Pre: ENG 250, or ENG 251, or ENG 252; or consent. Fall only. **DL**

**IP 363 Philippine Contemporary Literature in English (3)** Critical survey of 20th-century Philippine literature written in English; cultural values. Pre: one of ENG 250-257 or consent. (Cross-listed as ENG 375) **DL**

**IP 365 South Asian Literature in Translation (3)** Survey of traditional and modern literatures of South Asia; literature written originally in English. **DL**

**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. **DL**

**IP 367 Modern Philippine Film (3)** Study of Philippine cinema, its development and role in the country's political, social, and cultural history. Examines its place in the world of filmmaking. Pre: one of ENG 250-257. **DL**

**IP 368 Introduction to South/Southeast Asian Film, History, Theory and Appreciation (3)** Study and analysis of South/Southeast Asian Films—history, forms, development, theoretical framework and relationship to cultural, social, philosophical and aesthetic context. (B) Filipino. A-F only. Pre: One of ENG 250-257, or consent. **DH**

**IP 369B Study Abroad: Western Samoa (3)**

**IP 369E Study Abroad: Vietnam (3)**

**IP 373 Vedic Hindu Mythology (3)** Study of major Hindu myths of the Vedic Sanskrit literature within the perspective of ancient Indian civilization. Literary sources will be tapped for understanding creation, cosmogony and celestial, atmospheric and terrestrial divinities. A-F only. Pre: ANTH 200, ASAN 202, HIST 151, LLEA 122, or PHIL 102; or consent. Fall only.

**IP 374 Classical Hindu Mythology (3)** Study of major myths of Epic Sanskrit literature, primarily with focus of the Ramayana and Mahabharata. Literary sources will be tapped for appreciating myths and epics, especially with reference to dharma, karma, ways of life. Pre: ANTH 200, ASAN 202, HIST 151, LLEA 122, or PHIL 102; or consent. Spring only.

**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. Pre: one of ENG 250-257. **DL**

**IP 396 Philippine Literature and Folklore in Translation (3)** Philippine folk literature translated into English: epics, myths, legends, and other folklore. Classic works of vernacular writers. Pre: one of ENG 250-257 or consent. (Cross-listed as ENG 376) **DL**

**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. Pre: at least 6 credits of intermediate study of the same language.

**IP 401 Directed Fourth-Level Language Study (3)** Continuation of 302. Pre: 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. Pre: ILO 101, one of ENG 250-257, ENG 363, or ENG 396; or consent. **DL**

**IP 427 (Alpha) Topics in Samoan Literature (3)** (B) Writings of Albert Wendt. Pre: SAM 227 or one of ENG 250-257; or consent. (C) Samoan Women Writers. Pre: SAM 227 or one of ENG 250-257 or WS 254; or consent. **DL**

**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. Pre: 363 or 396 or ENG 250; or consent. **DL**

**IP 465 (Alpha) Hawaiian and Indo-Pacific Teaching Practicum (3)** An experienced-based introduction to various approaches in language teaching methodologies and techniques. Students' skills in teaching the Hawaiian or an Indo-Pacific language are developed through supervised teaching, class planning and evaluation. (B) Southeast Asian languages. Repeatable one time. CR/NC only. Pre: 402-level of the language practicum or consent; (B) CAM 402 or IND 402 or THAI 402 (or concurrent) and consent of instructor or equivalent language skills.

**IP 470 Folklore (3)** Theory and method of comparative and analytical folklore study, with special applications to Pacific traditions. Pre: ANTH 200. (Cross-listed as ANTH 470) **DS**

**IP 499 Directed Studies (V)** Study of a Pacific, South Asian, or Southeast Asian language through vernacular readings in various academic fields. Repeatable. Pre: third-level language and consent.

**IP 699 Directed Research (V)** Repeatable. Pre: consent.

## Indonesian (IND)

*College of Languages, Linguistics and Literature*

**IND 101 Elementary Indonesian (4)** Emphasis on the development of communicative competence in both oral and written language. Daily lab work. **HSL**

**IND 102 Elementary Indonesian (4)** Continuation of 101. **HSL**

**IND 103 Beginning Indonesian I (3)** Introduction into the Malay-Indonesian language for the purpose of communication, travel, further study, and enjoyment. Fall only. **HSL**

**IND 104 Beginning Indonesian II (3)** Introduction into the Malay-Indonesian language for the purpose of communication, travel, further study, and enjoyment. Spring only. **HSL**

**IND 112 Intensive Elementary Indonesian (10)** **HSL**

**IND 201 Intermediate Indonesian (4)** Continuation of 102. Meets five hours weekly; daily lab work. Pre: 102 or equivalent. **HSL**

**IND 202 Intermediate Indonesian (4)** Continuation of 201. **HSL**

**IND 212 Intensive Intermediate Indonesian (10) HSL**

**IND 301 Third-Level Indonesian (3)**

Continuation of 202. Conducted in Indonesian. Meets three hours a week. Reading, discussion, composition, and projects. Pre: 202.

**IND 302 Third-Level Indonesian (3)**

Continuation of 301.

**IND 303 Accelerated Third-Level Indonesian (6)**

**IND 305 Third Level Indonesian Online (2)**

This online course consists of modular, thematic, proficiency-based units exploring the language of the contemporary Indonesian media with an emphasis on reading, writing, and listening comprehension. Not open to students who have taken IND 301. Pre: 202 or equivalent language skills; or consent.

**IND 307 Third Level Indonesian Conversation (1)**

A topic-based course aimed to enhance student's listening and speaking skills in the Indonesian language. Not open to students who have taken 301. Pre: 202 or equivalent language skills, or consent. Co-requisite: 305. Fall only.

**IND 401 Fourth-Level Indonesian (3)**

Continuation of 302. Conducted in Indonesian. Meets three hours a week. Readings in various materials; speaking in various settings. Pre: 302.

**IND 402 Fourth-Level Indonesian (3)**

Continuation of 401.

**IND 452 Structure of Indonesian (3)**

Introduction to grammar; some sociolinguistic background. Pre: 302 or equivalent. **DH**

**IND 454 History of Indonesian (3)** Social and linguistic development of Indonesian from roots in earlier Malay to contemporary form and function. Pre: 202 and 452, or consent. **DH**

**IND 461 Modern Indonesian Literature (3)**

Selected readings, 1900 to present. Discussion and composition. Pre: 402 or consent. **DL**

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## Industrial Relations (IR)

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*College of Business Administration*

**IR 361 Labor Problems (3)** Problems and economics of labor; history, structure, government, activities of trade unions. **DS**

**IR 463 Negotiation and Workplace Dispute Resolution (3)**

Theory and practice in negotiating; design and operation of different kinds of workplace dispute resolution (such as mediation, arbitration, and various alternatives); features exercises on bargaining and negotiation and advocacy and decision skills. Pre: 361 or consent. Spring only.

**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. Pre: 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 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. **DS**

**IR 665 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.

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## Information and Computer Sciences (ICS)

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*College of Natural Sciences*

**ICS 101 Tools for the Information Age (4)**

Fundamental concepts and terms of computer technology, application software for problem solving, computer technology trends and impact on individuals and society.

**ICS 111 Introduction to Computer Science I (4)**

Overview of computer science, writing programs. Pre: 101 or equivalent. Recommended: computer experience.

**ICS 141 Discrete Mathematics for Computer Science I (3)**

Logic, sets, functions, matrices, algorithmic concepts, mathematical reasoning, recursion, counting techniques, probability theory. Pre: two years of high school algebra, one year of plane geometry, and precalculus assessment; or consent. **FS**

**ICS 211 Introduction to Computer Science II (3)**

Algorithms and their complexity, introduction to software engineering, data structures, searching and sorting algorithms, numerical errors. Pre: grade of "B" or higher in 111 or consent.

*All students wishing to enroll in ICS courses above 211 must meet the prerequisite grade requirement of B or higher in ICS 111 and 211 prior to registering for the course.*

**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 241 Discrete Mathematics for Computer Science II (3)**

Program correctness, recurrence relations and their solutions, divide and conquer relations, relations and their properties, graph theory, trees and their applications, Boolean algebra, introduction to formal languages and automata theory. Pre: 141 or consent. **FS**

**ICS 311 Algorithms (3)**

Design and correctness of algorithms, including divide-and-conquer, greedy and dynamic programming methods. Complexity analyses using recurrence relations, probabilistic methods, and NP-completeness. Applications to order statistics, disjoint sets, B-trees and balanced trees, graphs, network flows, and string matching. Pre: 211 and 241, 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: 212 and 241, or consent.

**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: 211 and 241, or consent.

**ICS 331 Logic Design and Microprocessors (4)**

(1 3-hr Lab) Basic machine architecture, microprocessors, bus organization, circuit elements, logic circuit analysis and design, microcomputer system design. Pre: 312 or consent.

**ICS 390 Computing Ethics for Lab Assistants (3)**

A lecture/discussion/internship course on ethical issues and instructional techniques for students leading a laboratory section of ICS 101 (Tools for the Information Age). Pre: 101 and consent.

**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, hierarchical 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: 311 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, sequential and indexed file processing, report writing, online transaction processing. Pre: 321 or consent.

**ICS 423 Computer Security (3)**

Legal, ethical and technology issues in computer access, confidentiality, authentication, privacy and intellectual property. Pre: Both 311 and 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 431 Computer Architecture (3)** Memory management, control flow, interrupt mechanisms, multiprocessor systems, special-purpose devices. Pre: 331.

**ICS 441 Theory of Computation (3)**

Grammars, sequential machines, equivalence, minimalization, 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 or consent.

**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: 212 and 311, 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: 311.

**ICS 463 Human Computer Interaction (3)**

Application of concepts and methodologies of human factors, psychology and software engineering to address ergonomic, cognitive, and social factors in the design and evaluation of human-computer systems. Pre: 311 or consent.

**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: 311 or consent.

**ICS 465 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 466 Design for Mobile Devices (3)**

Lecture course introducing design issues, programming languages, operating systems and mark-up languages for internet-enabled mobile devices, such as cell phones and PDAs. A-F or Audit. Pre: 311 or consent. Spring only.

**ICS 471 Probability, Statistics, and Queuing (3)**

A hands-on introduction to probability, statistical inference, regression, Markov chains, queuing theory. Use of an interactive statistical graphics environment such as R. Pre: 241 and 311, 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 either MATH 216, MATH 242, or MATH 252A; or consent.

**ICS 491 Special Topics (3)** Reflects special interests of faculty. Oriented toward juniors and

seniors. Repeatable one time for BS/CS students. Pre: at least two 300-level ICS classes or consent.

**ICS 499 Computer Project (V)** Individual or small-group projects in system design or application under faculty supervision. Pre: 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 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 614 Medical Informatics I (3)**

Introduction to the field of medical informatics, which is found at the intersection of clinical science, public health, information science, computer technology and communications technology. Concentration on current issues. Pre: 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 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 624 Advanced Data Management (3)**

Exploration of information retrieval and object-relational tools and methods for the management of distributed multimedia database systems. Pre: 321 or 421 or LIS 670; or consent.

**ICS 641 Theory of Computation (3)**

Advanced topics in formal languages, automata, computability, computational complexity. Pre: 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: 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)**

Studies of human performance in designing and using information systems. Emphasizes concepts and methodologies from human factors, psychology, and software engineering relating to human performance. Pre: 413.

**ICS 665 User Interfaces and Hypermedia (3)**

Advanced concepts in construction of interfaces between computers and their users. Hypermedia information structures, guidelines, problems, and tradeoffs. Discussion of selected readings, implementation of prototypes. Pre: 465.

**ICS 667 Advanced HCI Design Methods (3)**

Advanced analytical and empirical methods for the design and evaluation of usable, useful, and robust human-computer interfaces. Students will apply selected methodologies to a major system design project. Pre: 463 or 465; or consent.

**ICS 668 Technology Supported Collaboration (3)**

An advanced introduction to the design of human-computer systems and other technological artifacts for supporting human collaboration in learning, work and social contexts, and to theoretical perspectives and empirical studies of collaboration that inform such design. A-F only. Pre: 463 or 465 or 664 or 665 or 667 or LIS 677; or consent.

**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)**

Matrix algebra, multiple and partial correlation, factor analysis, canonical correlation, discriminant analysis with applications. Pre: 471. Recommended: 671.

**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. Pre: 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 theoretical computer science. 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)** Pre: graduate standing and consent.

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

**ICS 800 Dissertation Research (V)**



## Information Technology Management (ITM)

### College of Business Administration

**ITM 115 Introduction to Business Programming (3)** Introduction to programming with business-oriented applications. Software development tools, object-oriented software development, program flow and logic. A-F only.

**ITM 310 Topics in IS/ITM for Nonmajors (3)** This course provides varied opportunities to study information system and decision science topics relevant to general managers. Pre: consent (not open to MIS majors).

**ITM 352 Programming Application Systems (3)** Introduction to applications programming. Fundamentals, essential logic, file handling, report writing. Emphasis on systems development and disciplined programming. A-F only. Pre: ICS 101 or equivalent or consent.

**ITM 353 Information Systems Analysis and Design (3)** Analysis and design of systems in organizations. Includes role of general systems concepts, systems development life cycle, identifying systems requirements, logical and physical design. Pre: 352 and BUS 311; or consent.

**ITM 354 Database Systems (3)** Introduction to database management and data structures, including database planning and design, normalization, relational and network data models, and physical organization and implementation. Pre: 352 and 353, or consent.

**ITM 360 Current Topics in ITM (3)** Repeatable with permission of department chair. Pre: varies with topic.

**ITM 366 Information Systems in Organizations (3)** Practice of information systems in organizations. Capstone course for MIS majors. A-F only. Pre: 352, 353, 354 (or concurrent), and 357.

**ITM 385 Electronic Commerce (3)** Survey of electronic commerce technologies and business strategies, with an emphasis on technology and application development. The development of Web-based and multimedia applications; the impacts of EC on business strategy; legal and ethical issues. A-F only. Pre: BUS 311 or consent.

**ITM 387 (Alpha) Advanced Topics in Information Systems (3)** Computerized management information systems, operations research or business statistics: (B) Software systems economics; (C) advanced topics in programming; (D) web-based application development; (E) advanced technology in MIS; (F) systems development; (G) database systems; (H) advanced business applications; (J) simulation modeling and analysis; (K) business intelligence. Repeatable with permission of department chair. Pre: varies with topic. Co-requisite: 433.

**ITM 399 Directed Reading and Research (V)** Reading and research in 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.

**ITM 431 Networking (3)** Basic concepts in data networking, standards, architectures. Local and wide area networks. PC networking. The Internet. Telephony and Carriers. Pre: 352 and BUS 311 or consent.

**ITM 433 Information Security (V)** Fundamentals of corporate computer and network security management and technologies, viruses, worms, hacking, firewalls, cryptographic protections, incident and disaster response cyberwar. Repeatable one time. Once a year. Pre: 357 or 431; or consent.

**ITM 451 Nonparametric Methods (3)** Techniques for estimation of parameters and testing hypotheses that require no assumption about the form of the distribution function; application to business problems. Pre: BUS 310.

**ITM 453 Sample Design (3)** Theory and practice in the selection and statistical treatment of probability samples most appropriate for estimating characteristics of diverse populations. Pre: BUS 310.

**ITM 454 Experimental Design (3)** Analysis of variance techniques for identification and measurement of factors or treatments which affect productivity or quality of output in action systems. Pre: BUS 310.

**ITM 455 Applied Regression Analysis (3)** Application of multiple regression analysis to practical business problems. Related techniques of analysis of variance and co-variance, and discrimination analysis also discussed. Pre: BUS 310.

**ITM 614 Operations Research for Management I (3)** Operations research methods from managerial viewpoint. Emphasis on application of deterministic models to management decision-making. Pre: BUS 610 or consent.

**ITM 615 Operations Research for Management II (3)** Operations research models under risk and uncertainty including game theory, decision theory, Markov chains, replacement theory, and queuing theory. Emphasis on applications in the business environment. Pre: BUS 610 or consent.

**ITM 660 Current Topics in Information Systems (3)** Selected current practices and trends in decision sciences and MIS. May be repeated with change in topic. Pre: BUS 619 or consent.

**ITM 680 Statistical Decision Theory (3)** Modern statistical decision theory as applied to business. Topics include probabilistic models, decision making under uncertainty, and Bayes decision rules. Pre: BUS 610.

**ITM 683 Management of Information Systems (3)** Nature of organizational information systems. Concepts and impact of modern information technology, including computer hardware and software, database management, data communications and telecommunications, office automation. Pre: BUS 619 or consent.

**ITM 684 Decision Support Systems (3)** Theory and technology of management information systems with emphasis on decision support systems. Includes characteristics of MIS and DSS, technology support for decision making, integration of decision models, data analysis, and human-computer interaction. Pre: BUS 619 or consent.

**ITM 685 Electronic Commerce (3)** Fundamentals of electronic commerce technology and business strategy issues. The use of the Internet for marketing, supply-chain management, and retailing; an overview of networking technologies; the development of Web-based applications; policy, legal and ethical issues. A-F only. Pre: BUS 619 or consent.

**ITM 686 Computer Simulation (3)** Computer simulation as a research and analysis tool, present and potential uses of simulation models, technology of model construction, and the use of computer simulation for studying systems. Pre: BUS 619 or consent.

**ITM 687 (Alpha) Seminar in Information Systems (3)** Computerized management information systems, operations research, or business statistics: (B) data management and database approach; (D) telecommunications; (G) project investment decisions; (H) applied decision analysis; (I) risk assessment and business decisions; (J) data communication; (M) communication and technology. May be repeated for credit. Pre: BUS 619 or consent.

**ITM 699 Directed Research (3)** Reading and research in ITM under the direction of a faculty member. A-F only.

**ITM 704 Doctoral Seminar in Information Systems (3)** Extensive and critical review of the IS research literature. Can be retaken for credit. Repeatable three times. A-F only. Pre: CIS 703 (or concurrent) or consent.

**ITM 705 Research Seminar in E-Business in the Asia Pacific Region (3)** An overview of the current research issues in e-business with focus on the Asia Pacific Region. A-F only. Pre: PhD student status in international management or consent.

**ITM 706 International IT Organizational Research Methods (3)** An overview of current survey methodology and analysis in global information systems research. A-F only. Pre: PhD student status in international management or consent.

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

## Institute for Teacher Education (ITE)

### College of Education

**ITE 312 (Alpha) Foundations in Curriculum and Instruction (3)** Objectives and organization of school curriculum; methods, materials, and evaluation in instruction. Weekly observation and participation in classroom. (C) elementary education; (D) secondary education. Co-requisite: 317 for (C) only; 316 for (D) only.

**ITE 313 Literacy and Literature I (3)** Teaching strategies based on current theories of language will be modeled within an integrated whole language curriculum appropriate for multicultural classrooms. Repeatable. Co-requisite: 317. DL

**ITE 314 Literacy and Literature II (3)** Teaching strategies based on current theories of language will be modeled within an integrated

whole language curriculum appropriate for multicultural classrooms. Pre: 313. Co-requisite: 317. **DL**

**ITE 315 Field Experience (1)** Supervised field experience in schools. Minimum of 4 hours per week in conjunction with professional education courses. Repeatable. CR/NC only.

**ITE 316 Field Experience (2)** Supervised field experience in schools. Minimum of 8 hours per week in conjunction with professional education courses. Repeatable. CR/NC only.

**ITE 317 Field Experience (V)** Supervised field experience in schools. Minimum of 2 full days per week in conjunction with professional education courses. Repeatable. CR/NC only.

**ITE 318 Physical Education, Elementary (3)** Experience in using various methodologies and techniques, planning units and lessons, selecting resources for elementary physical education. Practical laboratory experience. Pre: KLS 333.

**ITE 319 Children's Literature (2)** Acquaintance with wide range of children's books; criteria for evaluation literature; using literature in the classroom. **DL**

**ITE 322 Social Studies, Elementary (3)** Purposes, methods, materials, and evaluation in teaching social studies, particular emphasis on developing children's knowledge, skills, self-concept, citizenship, inquiry/thinking, and values. Co-requisite: 317.

**ITE 323 Science, Elementary (3)** Science education in elementary school; methods and materials; laboratory activities selected from new science curricula. Co-requisite: 317.

**ITE 324 Mathematics, Elementary (3)** Inquiry-based approach to concepts and algorithms of whole numbers and introduction to geometry/measurement. Laboratory experiences on appropriate manipulatives. Pre: MATH 111 (strongly recommended) or MATH 100 or consent. Co-requisite: 317.

**ITE 325 Mathematics, Elementary II (3)** Inquiry-based approach to concepts and algorithms of fractions, decimals, graphing, and probability and statistics. Laboratory experiences on appropriate manipulatives. Pre: 324 or consent.

**ITE 326 Visual Art, Elementary (3)** Scope and organization of art in elementary school curriculum, creative use of art media through laboratory experiences.

**ITE 329 Performing Arts Expression, K-6 (3)** Development of communication skills through creative dramatics, rhythmic movement, related arts. Pre: admission to elementary cohort program. Co-requisite: 317.

**ITE 330 Language Arts, Secondary (3)** Teaching techniques and curriculum design in speaking, reading, writing, and other areas of secondary language arts. Pre: 312D. Co-requisite: 316.

**ITE 332 Social Studies, Secondary (3)** Introduction to teaching methods, instructional materials, and curriculum organization for secondary social studies. Pre: 312D. Co-requisite: 316.

**ITE 333 Science, Secondary (3)** Purposes and procedures; development of scientific attitude; review of major generalizations of biological and physical sciences. Pre: 312D. Co-requisite: 316.

**ITE 334 Mathematics, Secondary (3)** Purposes and procedures; development of basic mathematical concepts. Pre: 312D and MATH 311, MATH 351, or MATH 352. Co-requisite: 316.

**ITE 335 Foreign Languages, Secondary (3)** Methods, techniques, and materials; aims, procedures, tests; motivation, infusion of cultures in foreign language in secondary schools. Pre: 312D. Co-requisite: 316.

**ITE 336 Art, Secondary (3)** Purposes and procedures; the arts in relating to other curriculum areas. Pre: 312D. Co-requisite: 316.

**ITE 338 Secondary Career Guidance (3)** Teaching methods, materials, and curriculum design in secondary career guidance. Pre: 312D and basic or professional secondary teaching certificate or BEd and 12 credit hours in teaching concentration including EDCG 402 and EDCG 613. Co-requisite: 316.

**ITE 339 Speech-Communication, Secondary (3)** Objectives, materials, procedures for teaching speech-communication; speech modification, development; selected speech activities. Pre: 312D. Co-requisite: 316.

**ITE 343 Personal and Social K-6 Health Skills (3)** Experiences for elementary classroom teachers in creating interactive learning opportunities to teach personal and social responsibility for health through integration with other subject areas of school curriculum. Focus on National and Hawai'i Health Education Standards. A-F only.

**ITE 344 Methods and Techniques in Health Education (3)** Methods and techniques in teaching health education in secondary schools; student-oriented and teacher-centered methods; common problems in secondary health teaching. Skills, curriculum designs, and their implications for methods and techniques. Pre: 312D and KLS 202, or consent. Co-requisite: 316.

**ITE 346 Methods of Instruction, Industrial/Agricultural Education (3)** Techniques of individual and group instruction in laboratory and related classes, evaluation of various methods. Pre: 312D. Co-requisite: 316.

**ITE 347 Management of Industrial/Agricultural Facilities (3)** Organization of instruction; handling supplies; maintaining equipment and tools; purchasing materials; keeping records; making inventories. Pre: 312D. Co-requisite: 316.

**ITE 348 Teaching Business and Office Education (3)** Theory and methods of teaching business and office education courses. Pre: 312D, ACC 201, ACC 202, and ICS 160. Co-requisite: 316.

**ITE 349 Teaching Marketing and Distribution (3)** Theory and methods of teaching marketing and distribution courses. Pre: 312D, MKT 341 or MKT 351. Co-requisite: 316.

**ITE 353 Music in the Elementary School (2)** Goals, concepts, literature, materials, procedures, and evaluation for teaching music in grades K-6. For students in elementary education. Not intended for elementary music majors. Pre: 312C (or concurrent) and MUS 108.

**ITE 354 Music Education: Elementary (2)** Required for K-6 music specialists. Scope and nature of music in children's lives; planning,

teaching, learning, and evaluating music in elementary curriculum. Not open to those with credit in 353. Pre: 312C (or concurrent) and MUS 286, or consent.

**ITE 355 Music: Secondary Instrumental (2)** Objectives, materials, procedures of instrumental music in secondary school. Pre: 312D (or concurrent), MUS 151-152, MUS 153-154, MUS 155-156, MUS 326 (or concurrent), and MUS 354; or consent.

**ITE 356 Music: Secondary Vocal/General (2)** Objectives, materials, procedures of general and choral music in secondary school. Pre: 312D (or concurrent), MUS 121B, or consent.

**ITE 360 Introduction to Multicultural Education (2)** Concepts and methods to develop sensitivity and awareness of cultural influences on behavior as these relate to the schooling process. Field experience is an integral part of course. (Cross-listed as EDEF 360) **DS**

**ITE 371 Home Economics Education (3)** Curriculum design. Current educational philosophies and practices in home economics education. Teaching materials and techniques.

**ITE 380 Managing Classrooms (3)** Analysis of the factors that contribute to learning in the classroom and the development of teacher behaviors that promote such learning.

**ITE 390 (Alpha) Student Teaching (V)** Full-time supervised experience in school. (C) elementary; (D) secondary; (E) community college; (S) elementary/secondary regular education (for dual certification majors only). Pre: requirements for registration listed under "student teaching." Co-requisite: 391. Repeatable. CR/NC only.

**ITE 391 (Alpha) Seminar for Student Teaching (V)** Seminar relating current educational theories with experience in student teaching. (C) elementary; (D) secondary; (E) community college; (S) elementary/secondary regular education (for dual certification majors only). Pre: requirements for registration listed under "student teaching." Co-requisite: 390. Repeatable. CR/NC only.

**ITE 392 (Alpha) Student Teaching Modified (6)** Modified student teaching for individuals who have had prior extensive teaching experience or wish to repeat student teaching. CR/NC only. (C) elementary; (D) secondary. Pre: extensive teaching experience; requirements listed under "student teaching"; approval of review committee; consent. Co-requisite: 391.

**ITE 399 Directed Reading (V)** Individual reading or research. Pre: senior standing, major with a minimum cumulative GPA of 2.7 or a minimum GPA in education of 3.0, and consent.

**ITE 401 Introduction to Teaching (3)** Knowledge base for professional educators; educational needs of adolescents in a unique multicultural environment; curriculum planning, implementation, and assessment; school organization; development of individual and program goals. Minimum 30 hours field experience in secondary classrooms. A-F only. Pre: admission to PBCSE program or consent.

**ITE 402 Teaching Practicum (V)** Observation, analysis, participation and teaching in elementary, middle, and/or high school. One-hour weekly seminar accompanies the field experience.

Repeatable one time. CR/NC only. Pre: EDEP 311 or EDEP 611 or consent. Co-requisite: 403 and 404; or consent.

**ITE 403 Seminar in Educational Inquiry (3)** Study and discussion of general school-related topics and issues, e.g., dimensions of elementary and/or secondary schooling, school governance, curriculum design and development, the student learner, classroom management. Repeatable one time. A-F only. Pre: 401 or consent. Co-requisite: 402 and 404; or consent.

**ITE 404 (Alpha) Teaching in the Subject Field (3)** Purposes, procedures, curricula, evaluation in secondary school subject field: (B) art; (C) business and marketing; (D) language arts; (E) physical education; (F) industrial arts/agriculture; (G) mathematics; (H) science; (I) social studies; (J) foreign languages; (K) music; (M) home economics; (N) interdisciplinary. A-F only. Pre: 401 or consent. Co-requisite: 402 and 403.

**ITE 405 (Alpha) Teaching Residency (9)** Full-time student teaching experience in school. (C) elementary; (D) secondary; (E) community college; (S) elementary/secondary regular education (for dual certification majors only). CR/NC only. Pre: successful completion of all required courses or consent. Co-requisite: 406.

**ITE 406 Seminar in Teaching Residency (3)** Analysis and resolution of issues arising in student teaching; teaching skills and strategies; curriculum planning; professional growth and development; integration of teaching experiences with professional standards. A-F only. Pre: successful completion of all required courses or consent. Co-requisite: 405.

**ITE 410 Supervision of the Observation-Participation Student (2)** Basic guidelines for developing effective team relationships between the professional teacher and the observation-participation student. Pre: two years' teaching experience and consent.

**ITE 415 Early Childhood: Foundations and Curriculum (3)** Two-course sequence of theory, methods, and materials for teaching young children (2½ to 5 years). Emphasizes foundations, observation skills, and the design of learning environment. Pre: 312C. (Cross-listed as EDCS 415)

**ITE 415L Early Childhood: Foundations and Curriculum Lab (3)** Direct experience with children in early childhood settings in order to apply concepts from 415 and develop skills in observation, teaching, and classroom management. Co-requisite: 415. (Cross-listed as EDCS 415L)

**ITE 416 Early Childhood: Foundations and Curriculum (3)** Continuation of 415: focuses on appropriate curriculum for young children. Pre: 415. (Cross-listed as EDCS 416)

**ITE 416L Early Childhood: Foundations and Curriculum Lab (3)** Continuation of 415L. Co-requisite: 416. (Cross-listed as EDCS 416L)

**ITE 417 Developmentally Appropriate Practice: Ages 3–8 (3)** How to plan developmentally appropriate programs for young children, including the design of the learning environment; integrated, thematic planning; child guidance; assessment; and parent involvement. Pre: 312C.

**ITE 420 Supervision of Student Teaching (3)** Principles and methods; role of supervisor; human resources supervision in student teaching. Open to teachers interested in pre-service teacher education. Pre: three years teaching experience and consent.

**ITE 425 Working with Parents (3)** Knowledge and skills for relating effectively with families on behalf of the child; context in which families and schools interact; communication, problem solving, and increasing parental competence in settings for both normal and handicapped children. Pre: FAMR 341 or consent.

**ITE 427 Classroom Teaching Models in Affective Education (3)** Different approaches to affective education within conceptual framework useful to teachers. Teaching models include non-directed, self-concept, consciousness expansion, group communication, moral and value development, human relations training. Conceptual framework includes theoretical orientation and major theorists, activities and classroom applications, teacher's role, application to curriculum. Pre: observation/participation, and student teaching or teaching experience; or consent.

**ITE 430 Advanced Supervision of Student Teaching (3)** Advanced principles and methods: clinical supervision, observation recording, analysis, interpretation of classroom teaching; human resources supervision in student teaching. Pre: 420, successful supervision of two or more student teachers, and consent.

**ITE 436 Cooperative Vocational Education (3)** Planned work-experience program for special areas of vocational technical education. Acceptable type of wage-earning employment. Minimum of six 40-hour weeks or 240 work hours required. Repeatable. Pre: consent.

**ITE 438 Foundations of Vocational Education (3)** Historical and philosophical foundations of vocational technical education, overview of federal and state legislation and contemporary practices. Special emphasis on vocational education program in Hawai'i.

**ITE 439 Office and Marketing Technology (3)** Understanding and use of word processing, spreadsheet, and database software for business applications. Explore software across the office and marketing content areas.

**ITE 440 Curriculum Implications of Multicultural Education (3)** Examination of trends, issues, school practices, and program in multicultural education and its related area of study—bilingual-bicultural education. (Cross-listed as EDCS 440)

**ITE 441 Hawaiian Studies, Methods (3)** Examination of issues in Hawaiian and U.S. views of education and their application to the teaching of Hawaiian studies. Field experience required. A-F only. Pre: 312C, 312D, or consent. Co-requisite for BEd students: 317.

**ITE 444 Education of Exceptional Children in Regular Classroom (3)** Practices that facilitate teaching special needs students in regular classrooms. Techniques for meeting academic needs, managing behavior, motivating students, increasing peer interactions, communication between special and regular educators. (Cross-listed as SPED 444)

**ITE 445 Educating Exceptional Students in Regular Classrooms, Secondary (3)** Teaching secondary students with disabilities and those who are gifted/talented. Meeting academic/social needs, classroom management, motivation, peer interaction. Collaboration between special and regular educators. (Cross-listed as SPED 445)

**ITE 457 Asian and Pacific Music in Education (2)** Musical concepts in songs, dances, and instrumental music of Asia, Hawai'i, and other Pacific Islands, appropriate for K–12. Pre: 353, 354, or 355 and 356. (Cross-listed as MUS 457) DA

**ITE 480 Issues in Computer Education (3)** Integration of microcomputers into school curriculum and key issues related to microcomputer use in education. Pre: ETEC 442 or consent. (Cross-listed as EDCS 480)

**ITE 499 Directed Activity (V)** Individual work supervised by instructor. May consist of reading, research, teaching, and/or projects. Pre: consent of division director.

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

**ITE 550 Newspaper in the Classroom (2)**

**ITE 563 (Alpha) Practicum in Curriculum Development: Bilingual/Bicultural (1)** For in-service teachers to upgrade subject matter and develop teaching methods and materials for instruction. Repeatable. CR/NC only. Pre: teaching experience.

**ITE 564 (Alpha) Practicum in Curriculum Development: Bilingual/Bicultural (2)** For in-service teachers to upgrade subject matter and develop teaching methods and materials for instruction. Repeatable. CR/NC only. Pre: teaching experience.

**ITE 565 (Alpha) Practicum in Curriculum Development: Bilingual/Bicultural (3)** For in-service teachers to upgrade subject matter and develop teaching methods and materials for instruction. Repeatable. CR/NC only. Pre: teaching experience.

**ITE 566 (Alpha) Practicum in Curriculum Development: Career Education (1)** For in-service teachers to upgrade subject matter and develop teaching methods and materials for instruction. Repeatable. CR/NC only. Pre: teaching experience.

**ITE 567 (Alpha) Practicum in Curriculum Development: Career Education (2)** For in-service teachers to upgrade subject matter and develop teaching methods and materials for instruction. Repeatable. CR/NC only. Pre: teaching experience.

**ITE 568 (Alpha) Practicum in Curriculum Development: Career Education (3)** For in-service teachers to upgrade subject matter and develop teaching methods and materials for instruction. Repeatable. CR/NC only. Pre: teaching experience.

**ITE 569 (Alpha) Practicum in Curriculum Development: Computer Science (1)** For in-service teachers to upgrade subject matter and develop teaching methods and materials for instruction. Repeatable. CR/NC only. Pre: teaching experience.

**ITE 570 (Alpha) Practicum in Curriculum Development: Computer Science (2)** For in-

service teachers to upgrade subject matter and develop teaching methods and materials for instruction. Repeatable. CR/NC only. Pre: teaching experience.

**ITE 571 (Alpha) Practicum in Curriculum Development: Computer Science (3)** For in-service teachers to upgrade subject matter and develop teaching methods and materials for instruction. Repeatable. CR/NC only. Pre: teaching experience.

**ITE 572 (Alpha) Practicum in Curriculum Development: Humanities (1)** For in-service teachers to upgrade subject matter and develop teaching methods and materials for instruction. Repeatable. CR/NC only. Pre: teaching experience.

**ITE 573 (Alpha) Practicum in Curriculum Development: Humanities (2)** For in-service teachers to upgrade subject matter and develop teaching methods and materials for instruction. Repeatable. CR/NC only. Pre: teaching experience.

**ITE 574 (Alpha) Practicum in Curriculum Development: Humanities (3)** For in-service teachers to upgrade subject matter and develop teaching methods and materials for instruction. Repeatable. CR/NC only. Pre: teaching experience.

**ITE 575 (Alpha) Practicum in Curriculum Development: Language Arts (1)** For in-service teachers to upgrade subject matter and develop teaching methods and materials for instruction. Repeatable. CR/NC only. Pre: teaching experience.

**ITE 576 (Alpha) Practicum in Curriculum Development: Language Arts (2)** For in-service teachers to upgrade subject matter and develop teaching methods and materials for instruction. Repeatable. CR/NC only. Pre: teaching experience.

**ITE 577 (Alpha) Practicum in Curriculum Development: Language Arts (3)** For in-service teachers to upgrade subject matter and develop teaching methods and materials for instruction. Repeatable. CR/NC only. Pre: teaching experience.

**ITE 578 (Alpha) Practicum in Curriculum Development: Mathematics (1)** For in-service teachers to upgrade subject matter and develop teaching methods and materials for instruction. Repeatable. CR/NC only. Pre: teaching experience.

**ITE 579 (Alpha) Practicum in Curriculum Development: Mathematics (2)** For in-service teachers to upgrade subject matter and develop teaching methods and materials for instruction. Repeatable. CR/NC only. Pre: teaching experience.

**ITE 580 (Alpha) Practicum in Curriculum Development: Mathematics (3)** For in-service teachers to upgrade subject matter and develop teaching methods and materials for instruction. Repeatable. CR/NC only. Pre: teaching experience.

**ITE 581 (Alpha) Practicum in Curriculum Development: Natural Science (1)** For in-service teachers to upgrade subject matter and develop teaching methods and materials for instruction. Repeatable. CR/NC only. Pre: teaching experience.

**ITE 582 (Alpha) Practicum in Curriculum Development: Natural Science (2)** For in-service teachers to upgrade subject matter and develop teaching methods and materials for instruction. Repeatable. CR/NC only. Pre: teaching experience.

**ITE 583 (Alpha) Practicum in Curriculum Development: Natural Science (3)** For in-service teachers to upgrade subject matter and develop teaching methods and materials for instruction. Repeatable. CR/NC only. Pre: teaching experience.

**ITE 584 (Alpha) Practicum in Curriculum Development: Occupational Development (1)** For in-service teachers to upgrade subject matter and develop teaching methods and materials for instruction. CR/NC only. Repeatable. Pre: teaching experience.

**ITE 585 (Alpha) Practicum in Curriculum Development: Occupational Development (2)** For in-service teachers to upgrade subject matter and develop teaching methods and materials for instruction. CR/NC only. Repeatable. Pre: teaching experience.

**ITE 586 (Alpha) Practicum in Curriculum Development: Occupational Development (3)** For in-service teachers to upgrade subject matter and develop teaching methods and materials for instruction. CR/NC only. Repeatable. Pre: teaching experience.

**ITE 587 (Alpha) Practicum in Curriculum Development: Social Science (1)** For in-service teachers to upgrade subject matter and develop teaching methods and materials for instruction. Repeatable. CR/NC only. Pre: teaching experience.

**ITE 588 (Alpha) Practicum in Curriculum Development: Social Science (2)** For in-service teachers to upgrade subject matter and develop teaching methods and materials for instruction. Repeatable. CR/NC only. Pre: teaching experience.

**ITE 589 (Alpha) Practicum in Curriculum Development: Social Science (3)** For in-service teachers to upgrade subject matter and develop teaching methods and materials for instruction. Repeatable. CR/NC only. Pre: teaching experience.

**ITE 601 Professional Studies Seminar I (6)** Development of theoretical and practical knowledge base and skills for understanding, analyzing, and responding to teaching issues and problems. Co-requisite: 602.

**ITE 602 Field Experience and Seminar I (3)** Supervised field study of a school. Co-requisite: 601.

**ITE 603 Professional Studies Seminar II (6)** Development of pedagogical skills in planning and implementing instruction for target subject area/grade level. Pre: 601 and 602. Co-requisite: 604.

**ITE 604 Field Experience and Seminar II (3)** Team collaboration on responding to identified school need; supervised experience in mini-teaching. Pre: 601 and 602. Co-requisite: 603.

**ITE 610 Pre-internship Practicum (9)** Supervised experience in instructional planning and practice teaching. Pre: 603 and 604. Co-requisite: 611.

**ITE 611 Practicum Seminar (3)** Planning and methods seminar in conjunction with practice teaching. Pre: 603 and 604. Co-requisite: 610.

**ITE 612 Teaching Internship (9)** Full-time supervised teaching experience. Pre: 610 and 611. Co-requisite: 613.

**ITE 613 Internship Seminar (3)** Collaborative problem solving of issues and concerns encountered in current teaching experiences. Pre: 610 and 611. Co-requisite: 612.

**ITE 699 Directed Reading and/or Research (V)** Individual reading and/or research. Repeatable 5 times. A-F only. Pre: written consent.

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## Insurance (INS)

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*College of Business Administration*

**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.

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## Interdisciplinary Studies (IS)

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*College of Arts and Sciences*

**IS 100 Marine Option Program Seminar (1)** Statewide overview of ocean issues and organizations involved with marine activities, management, education, research, and business. Exploration of opportunities for internships, research projects, study and careers. Proposal writing, project implementation, and report preparation guidelines. Orientation to the Marine Option Program.

**IS 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. (Cross-listed as ENGR 250)

**IS 291 Community Service Practicum (V)** Supervised fieldwork in community agency, arranged by student. Repeatable one time. 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 member.

**IS 310 Cinematic and Digital Narrative Production (4)** Production-intensive course with collaborative projects, as well as individual

production projects. Laboratory component to the course of one credit, as well as screenings of film and television content. A-F only. Pre: ENG 100 and a ENG 200-level course, or consent.

**IS 311 Independent Study Tutorial (V)**  
Independent study tutorial. A-F only.

**IS 315 Narrative Game Design (3)** Storytelling through computer games. Effect of interactivity on narrative. Interactive plot structures, conceptual design, artwork, audio, cinematography, two- and three-dimensional computer graphics. Design and programming of game narrative using scripting languages. A-F only. Pre: consent.

**IS 320 3D Computer Animation Prod I (3)**  
3D computer graphics production projects. Students will write, plan, execute, and deliver a 30 second computer-animated short film. Emphasis on visual storytelling and character animation. A-F only. Pre: consent. Fall only.

**IS 321 Native Americans and Native Hawaiians (3)** Comparative-contrastive examination of similarities and differences between Native Americans and Native Hawaiians as the only indigenous peoples of the U.S. with special attention to sociohistorical parallels and mutual contacts since contact with Europeans. The course perspective is explicitly interdisciplinary by drawing not only on sociology and history, but also on archaeology, ethnology, linguistics and still other disciplines. A-F only. Pre: HIST 151 and HIST 152 and an introductory course in cultural anthropology, political science or sociology, or consent. **DS** (Alt. years)

**IS 322 Ethnohistory (3)** Review of ethnohistory, i.e. the interdisciplinary, holistic and inclusive investigation of the histories of native peoples drawing not only on documented sources, but also on ethnography, linguistics, archaeology, ecology and other disciplines as an alternative to conventional Eurocolonial history. A-F only. Pre: HIST 151 and HIST 152, or consent. **DS** (Alt. years)

**IS 330 Information Technology and Culture (3)** Investigation of the impact of information technologies on contemporary culture from a variety of perspectives. A-F only. Pre: upper division or consent.

**IS 331 Science and Culture (3)** Cultural studies of science from historical, philosophical, sociological and literary perspectives. Examination of intersections of science, race, gender and environment. A-F only. Pre: upper division or consent.

**IS 361 People, the Ocean and the Environment (3)** People's impact on quality of coastal and ocean environments, especially Hawaiian; scientific, legal, socioeconomic aspects. Ocean pollution, ocean technology. Pre: OCN 201, ORE 202, or ZOOL 200; or consent.

**IS 369 British Life and Culture (3)** For Study Abroad Program students participating in the UH Mānoa Semester in London. Emphasis is placed on understanding within historical contexts important issues for contemporary British society — particularly those of class, power, gender, and race. A-F only. Pre: participation in London Semester Program.

**IS 399 Directed Reading and Research (V)**  
Directed reading and research. Repeatable two times.

**IS 400 Ocean Internships and Research (V)**  
Students carry out marine-related internships, practica, research projects or field experience on- or off-campus with faculty guidance. Repeatable one time. A-F only. Pre: minimum cum GPA of 2.5, junior or senior standing in any field of study and IS 100 or consent, project proposal.

**IS 405 Africana Studies I: Africans in the New World (3)** Comparative interdisciplinary exploration of black voices examining African history before slavery, the slave trade, slavery in the Americas (US, Caribbean, S. America) resistance, cultural carryovers and hybridity in culture and identity. A-F only. Pre: junior standing or departmental approval.

**IS 406 Africana Studies II: Africans in the New World (3)** Comparative interdisciplinary exploration of black voices testifying to the political, historical and cultural experiences of the African Diaspora; through an exploration of Black Literature, biography, poetry, political, religious and philosophical texts, journalism, the blues, jazz and rap! A-F only. Pre: junior standing or departmental approval.

**IS 407 Black Women Writers (3)** Comparative interdisciplinary course exploring issues of race, gender, culture, class, politics, community, health and spirituality in black women's writing across the African diaspora. A-F only. Pre: junior standing or departmental approval.

**IS 410 The Humboldt Brothers' Legacy (3)**  
Life and thought of the two Humboldt brothers. Alexander (1769-1859) helped to lay the foundations of modern science, including geology, geography, botany, zoology, physiology and anthropology. Older, less well-known Wilhelm (1767-1835) was an influential statesman, classical scholar, man of letters, humanist, political philosopher, anthropologist and linguist, and founded the University of Berlin. Review of the two polymaths' impact on modern science in the Americas, the Pacific and Asia. A-F only. Pre: upper-division or consent. **DH**

**IS 480 Oceanic Film, TV and Multimedia Culture (3)** Involves close textual analysis of film, TV and multimedia content. The course includes cinematic and television screenings. A-F only. Pre: ENG 100, ENG 200-level course, a course on Oceanic or Hawaiian culture or consent.

**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 490 Global Media (3)** Involves close textual analysis and strategic analysis of the globalism phenomenon, with an emphasis on transnational media corporations. A-F only. Pre: ENG 100 and a 200-level ENG course, and a critical studies course on Media or Film Studies. Fall only.

**IS 499 Directed Reading and Research (V)**  
Directed reading and research. Repeatable two times.

**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 Integrative Seminar in Gerontology (V)** Integrative seminar. A-F only. Pre: Graduate standing or consent. (Cross-listed as PH 789 (G))

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## International Cultural Studies (CUL)

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*College of Social Sciences*

**CUL 609 Faculty Seminar Series (1)** Seminar consists of a series of presentations by certificate faculty on topics of ongoing research. Presentations will open current debates about theory and method in cultural studies. A-F only.

**CUL 610 International Cultural Studies: History and Theory (3)** Seminar on the history and theory of interdisciplinary cultural studies. The politics of culture are examined in comparative perspective, focusing on their significance for identity formation, intercultural relations, and global flows of images, people and capital. Approaches to the study of media and popular culture are taken up in terms of their relevance for contemporary issues, especially in Hawai'i and the Asia/Pacific/U.S. region. Repeatable one time. A-F only. Fall only.

**CUL 750 International Cultural Studies: Research Project (3)** Directed reading and research culminating in a project that engages issues in international cultural studies. Types of projects include scholarly essays, community-based projects, performances or exhibitions. Written statement of purpose and self-evaluation required. A-F only. Pre: 609 and 610.

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## IP

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*See Indo-Pacific Languages*

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## IR

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*See Industrial Relations*

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## Italian (ITAL)

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*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 (3)** Conversation, grammar, and reading. Pre: consent. **HSL**

**ITAL 102 Elementary Italian (3)** Conversation, grammar, and reading. Pre: consent. **HSL**

**ITAL 160 Intensive Elementary Italian Abroad (V)** Intensive course of formal instruction on the first-year level in Italian language and culture in Italy. **HSL**

**ITAL 201 Intermediate Italian (3)** Reading, conversation, laboratory drill, composition. Pre: 102. **HSL**

**ITAL 202 Intermediate Italian (3)** Continuation of 201. Pre: 201. **HSL**

**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. Pre: 102 or 160 or equivalent. **HSL**

**ITAL 259 Intermediate Italian Abroad (3)** Continuation of 258. **HSL**

**ITAL 260 Intensive Intermediate Italian Abroad (V)** Intensive course of formal instruction on the second-year level in Italian language and culture in Italy. For semester programs only. Pre: 102 or 160. **HSL**

**ITAL 311 Conversation (3)** Systematic practice for control of spoken Italian. Further development of vocabulary for accurate, mature expression. Pre: 202 or consent.

**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. Pre: 202 or 259 or 260 or equivalent.

**ITAL 359 Third-Level Italian Abroad (3)** Continuation of 358.

**ITAL 360 Intensive Third-Level Italian Abroad (V)** Intensive course of formal instruction on the third year level in Italian language and culture in Italy. For semester programs only. Pre: 202 or 260 or equivalent.

**ITAL 458 Fourth-Level Italian Abroad (3)** Intensive course of full-time formal instruction in Italy on the fourth-year level in Italian language, linguistics, culture, and literature. Pre: 359 or 360 or equivalent.

**ITAL 459 Fourth-Level Italian Abroad (3)** Continuation of 458.

**ITAL 460 Intensive Fourth-Level Italian Abroad (V)** Intensive course of formal instruction on the fourth-year level in Italian language and culture in Italy. For semester programs only. Pre: 360 or equivalent.

## 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 in the prerequisite courses is required for continuation.*

**JPN 100 Elementary Japanese, Special (3)** Same material as 101, covered more quickly for students with some language background. Pre: placement test. **HSL**

**JPN 101 Elementary Japanese (4)** Listening, speaking, reading, writing, grammar. Meets one hour, four times a week, plus lab work. Pre: placement test or consent. **HSL**

**JPN 102 Elementary Japanese (4)** Continuation of 100 or 101. Pre: 100 or 101; or consent. **HSL**

**JPN 105 Accelerated Elementary Japanese (8)** Content of 101 and 102 covered in one semester. Meets two hours, four times a week, plus lab work. Pre: consent. **HSL**

**JPN 111 Elementary Japanese for Oral Communication I (3)** The first of a series of courses focusing on speaking and listening skills necessary to performing in common situations in Hawai'i and Japan. Pre: consent. **HSL**

**JPN 112 Elementary Japanese for Oral Communication II (3)** Continuation of 111. Pre: 100 or 101 or 111, or consent. **HSL**

**JPN 201 Intermediate Japanese (4)** Continuation of 101 and 102. Meets one hour, four times a week, plus lab work. Pre: 102, 105, or placement test; or consent. **HSL**

**JPN 202 Intermediate Japanese (4)** Continuation of 201. Pre: 201 or placement test; or consent. **HSL**

**JPN 205 Accelerated Intermediate Japanese (8)** Content of 201 and 202 covered in one semester. Meets two hours, four times a week, plus lab work. Pre: 102, 105, or consent. Fall and Spring only. **HSL**

**JPN 211 Intermediate Japanese for Oral Communication I (3)** Continuation of 111-112. Pre: 102 or 105 or 112, or consent. **HSL**

**JPN 212 Intermediate Japanese for Oral Communication II (3)** Continuation of 211. Pre: 201 or 211, or consent. **HSL**

**JPN 217 Introduction to Japanese Reading and Writing with Basic Kanji (3)** For students who have completed the oral communication courses up through JPN 212 and wish to continue on to JPN 301. Also appropriate for semi-bilingual students who lack literacy skills. Pre: 212 or consent.

**JPN 258 Intermediate Japanese Abroad (4)** Intensive course of formal instruction on the second-year level in Japanese language and culture in Japan. Pre: 102. **HSL**

**JPN 259 Intermediate Japanese Abroad (V)** Continuation of 258. A-F only. Pre: 201 or consent. **HSL**

**JPN 301 Third-Year Japanese (4)** Transitional course employing four skills (listening, speaking, reading, writing) and grammar training to prepare students to address academic content in Japanese. Meets one hour, four times a week, plus lab work. Pre: 202, 205, or placement test; or consent.

**JPN 302 Third-Year Japanese (4)** Continuation of 301. Pre: 301 or placement test; or consent.

**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 301 level. Pre: placement test.

**JPN 308 Special Japanese Reading and Writing (3)** Continuation of 307. Pre: 307 or placement test.

**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 318 Oral Fluency Through Film (3)** Training in oral communication and comprehension skills utilizing the spoken text and visual segments from Japanese film and television dramas. Pre: 301 or consent.

**JPN 332 Advanced Japanese Reading and Writing (3)** Web-based training in Japanese reading and writing to develop skills at the advanced level. Course activities combine independent work with communicative activities on the web site. Ideal for in-service professionals seeking language development and maintenance. Repeatable one time. Pre 301 (or concurrent) 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. **DH**

**JPN 358 Third-Level Japanese Abroad (4)** Intensive course of full-time formal instruction on the third-year level in Japanese language and culture in Japan. Pre: 202.

**JPN 359 Third-Level Japanese Abroad (4)** Continuation of 358. Pre: 301 or 358.

**JPN 370 Language in Japanese Society (3)** Review of the use of Japanese respect language in relation to social structure, interpersonal relationships, and ways of thinking. Pre: 302, 305, or consent.

**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. CR/NC only. 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.

**JPN 405 Fourth-Level Japanese Reading: Accelerated (6)** Content of 401 and 402 covered in one semester. Meets daily Monday–Friday. Pre: 302, 305, or placement test.

**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 (3)** 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 423 Advanced Listening and Speaking (3)** Offers training in listening and speaking for bilingual and other advanced learners. Emphasis on formal Japanese such as academic lectures, news, exchanges in business settings, public speaking, etc. Open to non-majors. Pre: 421 or consent.

**JPN 425 Japanese Translation (3)** Training in techniques of translating Japanese into English. Pre: 407 or consent.

- JPN 431 Advanced Business Writing (3)** Advanced business writing course for bilingual and other advanced learners. Open to non-majors. Japanese Writing Intensive. Spring only. Pre: 421 or consent.
- JPN 451 Structure of Japanese (3)** Introduction to phonology, morphology, syntax, and semantics of modern colloquial Japanese. Pre: 402 or 405, and 350 or LING 320; or consent. **DH**
- JPN 452 Introduction to Japanese Pedagogical Grammar (3)** Introduction to teaching of basic Japanese grammatical patterns. Open to nonmajors. Pre: 350 or LING 320, and 407; or consent.
- JPN 458 Fourth-Level Japanese Abroad (3)** Intensive course of full time instruction on the fourth-year level in Japanese language and culture in Japan. Pre: 302.
- JPN 459 Fourth-Level Japanese Abroad (3)** Continuation of 458. Pre: 401 or 458.
- 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 one time with permission. Pre: 461 or consent. **DL**
- JPN 471 Okinawan Language and Culture I (3)** The first of a series of two courses (JPN 471-472) focusing on Okinawan literature, language skills, heritage, and cultural understanding. Pre: 302 or 308 or consent. **DH**
- JPN 472 Okinawan Language and Culture II (3)** The second of a series of two courses (JPN 471-472) focusing on Okinawan literature, language skills, heritage, and cultural understanding. Pre: 302 or 307 and 471; or consent. **DL**
- JPN 475 Introduction to Japanese Sociolinguistics (3)** Application of general linguistics to social phenomena such as group identity, language and gender, dialects and intercultural communication. Pre: 302, 350 and 370; or consent.
- JPN 485 Advanced Readings in Modern Japanese Literature (3)** Advanced course to foster speed, accuracy and attention to stylistic issues in modern Japanese literature. Pre: 407E and one of 407B, 407C, or 407D; or consent. **DL**
- JPN 486 Advanced Readings in Modern Japanese Contemporary Topics (3)** Advanced course to foster speed, accuracy, and attention to content in reading modern discursive texts. Pre: two of 407B, 407C, 407D, or 407E; or consent. **DH**
- JPN 490 Advanced Language Study: Japanese (3)** Advanced course in spoken and written Japanese stressing intensive research using the Internet, electronic mail in Japanese and conventional media. Oral presentations, written reports and journal writing. Repeatable. Pre: 485 or equivalent and consent.
- JPN 493 Project Work in Japanese (3)** Enhances Japanese language skills through a field-based research project on the topic of the individual student's choice. Interviews, surveys, observations, written materials and A/V-assisted oral presentations. Repeatable one time. Pre: 402 or equivalent, or consent.
- JPN 495 (Alpha) Internship Program (3)** Analysis of intercultural communication processes under faculty supervision through participation in an organization serving native speakers of Japanese. (B) Business, repeatable one time; (C) Travel industry internship. Repeatable one time A-F only. Pre: 302 and 370 (or concurrent) or consent for (C); 431 for (B).
- 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. CR/NC only. 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); or consent.
- 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 Japanese Sociolinguistics (3)** Introduces theories of language use and provides training in the methodology and analysis of Japanese sociolinguistics. Pre: 407 and 475 or equivalent, and 605 (or concurrent); or consent.
- JPN 610 (Alpha) Japanese Poetry (3)** Historical survey of major poetic types. Repeatable one time 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 one time with consent. (B) Meiji-Taisho (1868-1926); (C) Showa-Heisei (1926-present). Pre: 485 or consent.
- JPN 612 Edo Literature (3)** Critical reading and analysis; emphasis on prose. Repeatable one time 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 one time with consent. Pre: 466 or consent.
- JPN 620 Practicum: Teaching Japanese Language (3)** This course is designed for graduate students pursuing Japanese language teaching and learning, while developing teaching skills, curriculum competence, and leadership. Pre: 604 or EALL 601 or consent.
- JPN 626 Introduction to Japanese Manuscripts and Xylographs (3)** Introduction to Classical Japanese writing system as found in the xylographs and manuscripts of the Heian and Kamakura periods; reading and analysis of the texts in original script. Meets three hours weekly. Repeatable one time. Pre: 461 or 466 or consent. (Alt. years)
- JPN 631 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 and 605; or consent.
- JPN 633 Advanced Japanese Sociolinguistics (3)** Variations in language form and use depending on social factors. Pre: 601 or 602 (or concurrent), 605 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 nonmajors. Repeatable with consent. Pre: 485 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: 461 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 (*Kokugo-gaku-shi*); Pre: 631 (M) morphophonemics; Pre: 601 (P) pedagogy; Pre: 632 (S) sociolinguistics; Pre: 633.
- JPN 699 Directed Research (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: 634 (H) historical change; Pre: 631 (K) history of Japanese language studies (*Kokugo-gaku-shi*); Pre: 631 (M) morphophonemics; Pre: 601 (P) pedagogy; Pre: 632 (S) sociolinguistics; Pre: 633.

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**Journalism (JOUR)**


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*College of Social Sciences*

**JOUR 150 The Press and Society (3)**  
Communications media in theory and practice. Development, role, influence; rights, responsibilities, problems, issues, and trends. **DS**

**JOUR 301 Fundamentals of Journalism (6)**  
Theory and extensive practice in reporting, writing and editing news stories across multiple media platforms. Fall only.

**JOUR 302 Journalism Tools and Platforms (6)**  
Tools for contemporary newsgathering and technologies for presentation across multiple media platforms. Pre: 301 or departmental approval.

**JOUR 307 Photojournalism (3)**  
Production, selection, and use of photographs for publications. Storytelling action and feature photos scanned and worked up through Adobe Photoshop and QuarkXpress. Students must have a 35mm single lens reflex camera and supply own color negative film. A-F only.

**JOUR 316 Advanced Editing (3)**  
Intensive training in editing, planning, and organizing stories and visual elements for publication; news judgment; managing projects. Pre: consent.

**JOUR 325 Magazine Writing (3)**  
Writing nonfiction articles for magazines, newspapers, and newsletters; preparing material for specific audience; marketing articles.

**JOUR 327 Interpretive Journalism (3)**  
Writing articles of news analysis, editorials, and critical reviews. Pre: 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. **DS**

**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. Pre: upper division standing or consent. (Cross-listed with COM 451) **DS**

**JOUR 385 Practicum (1)**  
Working on campus student or quasi-professional publications under professional and faculty supervision. CR/NC only. Repeatable. Pre: consent.

**JOUR 390 (Alpha) Journalism Workshops (V)**  
Short-term intensive workshops in journalism and mass communication skills and projects. (B) workshop in new media; (C) workshop in reporting; (D) workshop in editing; (E) workshop in broadcast journalism; (F) workshop in public relations. Repeatable one time. A-F only. Pre: consent.

**JOUR 401 Journalism Projects/Production (6)**  
Intense problem-based application of skills and knowledge to production of a major Journalism project across multiple media platforms. Pre: 302 or departmental approval. Fall only.

**JOUR 402 Intellectual Foundations (6)**  
Intellectual, historical, social and cultural contexts of contemporary journalism. Pre: 302 or departmental approval.

**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 425 Publication Layout and Design (3)**  
Visual display concepts and procedures for newsletters, brochures, newspapers, magazines. Pre: upper division standing.

**JOUR 460 Media Ethics (3)**  
Ethics and social responsibility for media professionals. Application of ethical theories and principles to case studies and research projects. Pre: any 300-level course in journalism or communication. (Cross-listed as COM 460)

**JOUR 475 Global Communication (3)**  
Problems and opportunities of communication in a variety of international contexts. Focus on commerce, diplomacy, and mass communication. Pre: COM 201 or consent. (Cross-listed as COM 475) **DS**

**JOUR 485 Fieldwork (3)**  
Internship in media or PR operations under professional and faculty supervision. CR/NC only. Pre: 302 and consent.

**JOUR 499 Directed Research (V)**  
Individual research projects. Pre: senior standing and consent of department chair.

**JOUR 515 Advising School Publications (2)**

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**Kinesiology and Leisure Science (KLS)**


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*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 a 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 107 Aqua-Aerobic Fitness (1)**  
Combined lecture-lab-physical activity course with emphasis on aerobic fitness improvement through total body aquatic workouts with music, and development of individualized aquatics fitness program. Open to all students.

**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; handicapping 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, forehand 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. **DA**

**KLS 124 Dances of Hawai'i (1)**  
Background and fundamentals of hula. Selected dances with and without instruments. **DA**

**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. **DA**

**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. **DA**

**KLS 127 Social Dance: Latin (1)**  
Social dances of a Latin flavor including rumba, cha-cha, tango, samba, and others. Basic steps, rhythm pattern, styling, and variations are taught. Social etiquette is stressed. **DA**

**KLS 130 Tennis: Beginning (1)**  
Rules, etiquette, grip, forehand 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: Beginning (1)**  
Combined lecture-lab-physical activity course with emphasis on beginner skills and knowledge relative to serving, passing, spiking, digging,



blocking, and offensive and defensive strategy. Open to all students.

**KLS 136 Volleyball: Intermediate (1)**

Combined lecture-lab-physical activity course with emphasis on improving skills and knowledge through practice and cognitive activities relative to serving, passing, spiking, digging, blocking, and offensive and defensive strategy. Open to all students. Pre: 135 or consent.

**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 Olympic and Power Lifting (1)**

Exercise technique and prescription with an emphasis on anaerobic exercise. The course explores advanced periodization models and their utilization, mastery of Olympic lifts, and plyometric programs. Pre: 152 or consent.

**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 technique. 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 181 Sport Proficiency I: Invasion (3)**

Knowledge, skill development, position, and strategy of various invasion type games/sports. The core sports, basketball, soccer, speedball, flag football, and ultimate frisbee, are introduced within a tactical framework. Primarily for KLS majors. A-F only.

**KLS 182 Sport Proficiency II: Net, Field and Target (3)**

Knowledge, skill development, position, and strategy of net, field and target sports. The core sports, volleyball, tennis, softball, and golf are introduced within a tactical framework. Primarily for KLS majors. A-F only.

**KLS 185 Floor Exercise Gymnastics (1)** An entry-level course designed to develop students' knowledge of men's and women's 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 187 Softball (1)** Combined lecture-lab-physical activity course with emphasis on basic skills, rules, etiquette, offensive and defensive strategies, position play, and game situations. Open to all students.

**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 Foundations of Physical Education (3)**

Physical Education as a professional field. Overview of history, philosophy, and current practices in Physical Education. Survey of psychological and sociological foundations of exercise and sport. KLS majors or approval. Repeatable one time. A-F only. Recommended: 195

**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. DB

**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 210 Leisure Education and Life Skills Development (2)**

Using sports as a learning tool, students will gain awareness, acquire knowledge and develop skills to enhance their classroom, athletic and personal performance. Class topics include current issues and strategies for maintaining healthy lifestyles.

**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 270 Introduction to Physical Education (3)**

Foundational knowledge provided for physical education majors. Concepts and skills necessary for effective teaching, management, and assessment (K-12) are shared. Emphasis on introduction to teaching physical education. Repeatable one time. A-F only. Pre: consent. Fall 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 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: 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: 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: consent.

**KLS 313 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: consent.

**KLS 323 Music and Rhythm in Physical Education (3)** Use of music in physical education programming (K-12), emphasizing selection of appropriate music for specific activities as expressive or creative movement, movement exploration, rhythmic gymnastics, and dancing. A variety of strategies for teaching dance will be shared. A-F only. Pre: consent. Spring only.

**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 (3)** 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. DB

**KLS 333 Movement Education I (3)** A movement-based approach to teaching basic motor skills in preschool/elementary physical education. Students actively participate and learn about developmentally appropriate content and pedagogy for children in grades P-5/6. Peer bit teaching is included. A-F only.

**KLS 334 Movement Education II (3)** Content and pedagogy for teaching preschool/elementary physical education for physical education majors. Students will learn to plan and teach physical education for children in grades P-5/6. Peer bit teaching is included. A-F only. Pre: 270 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.

**KLS 336 Coaching of Swimming (2)** Theory and methods of coaching competitive swimming. Technical, organizational, and administrative aspects. Emphasis on stroke mechanics and training methods. Pre: consent.

**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 Field Work in Strength and Conditioning (1)** Supervised practicum in strength training and conditioning. Students will be exposed to the theory and practice of designing and implementing both strength/power, and general conditioning programs. Repeatable one time. Pre: 152 and 489 (or concurrent); or consent.

**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 353 Structural Kinesiology (3)** Gross human anatomy, emphasizing identification and description of parts of the musculoskeletal system; selected applications to motor activity.

Primarily for physical education majors, but open to others with consent. A-F only. Pre: PHYL 141 and PHYL 141L and PHYL 142 (or concurrent) and PHYL 142L (or concurrent).

DB

**KLS 354 Exercise and Sport Physiology (3)** Emphasis on physiological responses to exercises and physical training as related to strength, muscular endurance, cardio-respiratory endurance. Primarily for KLS majors, but open to others with consent. A-F only. Pre: 353 (or concurrent), PHYL 141, PHYL 141L, PHYL 142, and PHYL 142L; or consent. DB

**KLS 354L Exercise and Sport Physiology Lab (2)** Laboratory section to accompany KLS 354. Emphasis will be hands-on data collection and analysis of the physiological responses to exercise and physical training as related to muscular strength, power and endurance. A-F only. Pre: 353 (or concurrent), PHYL 141, PHYL 141L, PHYL 142, PHYL 142L or consent. Fall only.

**KLS 371 Teaching Techniques II: Invasion (3)** Teaching techniques and methods of selective invasion activities. These include core sports, basketball, soccer, speedball, flag football, and ultimate frisbee, that emphasize the tactical approach in field experiences. Primarily for KLS majors. A-F only. Pre: 182 and consent.

**KLS 372 Teaching Techniques II: Net, Field and Target (3)** Teaching techniques and methods of selective net, field and target activities. These core sports, volleyball, tennis, softball, and golf, that emphasize the tactical approach in net, field and court experiences. Primarily for KLS majors. A-F only. Pre: 182 and consent.

**KLS 384 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. Pre: 195 or consent.

**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.

**KLS 393 Athletic Training Practicum I (1)** Introductory-level supervised experiences within the profession of athletic training. This practicum is a requirement for entry to the KLS Master's Athletic Training Program. A-F only.

**KLS 394 Athletic Training Practicum II (1)** Introductory-level supervised experiences within the profession of athletic training. This practicum is a requirement for entry to the KLS Master's Athletic Training Program. A-F only.

**KLS 395 Personal Health and Wellness (3)** Scientifically based information will be presented to help the student make decisions and take responsibility for his/her own health and health-related behaviors. The student will develop a personal, daily physical activity/exercise program, in which he/she will participate and be monitored. DB

**KLS 399 Directed Reading (V)** Individual problems. 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 402 Teaching Practicum in Physical Education (2)** Field experience in teaching physical education activities program in private and public schools; techniques in leadership; selection of activities and program evaluation for K-12 licensure. Repeatable one time. A-F only. Pre: 270 and 371-372, or consent. Co-requisite: 404.

**KLS 404 K-12 Teaching Methods in Physical Education (3)** Methods and materials in teaching physical education activities program; techniques in leadership; selection of activities and program evaluation for K-12 licensure. Repeatable one time. A-F only. Majors only. Co-requisite: 402.

**KLS 405 Teaching Residency (9)** Full-time supervised experience in elementary and secondary school level. Repeatable one time. A-F only. Pre: 402 and 404; requirements for registration listed under "student teaching"; or consent. Co-requisite: 406.

**KLS 406 Seminar in Teaching Residency (3)** Analysis and resolutions of issues in teaching residency; teaching strategies and techniques; curriculum planning; professional growth and development. Repeatable one time. A-F only. Pre: 402 and 404; or consent. Co-requisite: 390.

**KLS 415 Prevent/Care of Athletic Injuries (3)** An examination of the most recent practices and procedures in the prevention and care of athletic and sports injuries. Observational field experiences in athletic training will be required. A-F only. Pre: ANAT 301, ANAT 301L, ANAT 302, ANAT 302L or consent.

**KLS 416 Fundamentals of Ergonomics (3)** Introduction to ergonomics principles and their application in understanding and prevention of Muscular Skeletal Disorders encountered in the working environment including introduction to legal aspects of ergonomics. Pre: 263 or consent. (Cross-listed as NURS 416)

**KLS 419 Administration in Athletic Training, Exercise Science, Allied Health (3)** An examination of organization and administration in Athletic Training, Allied Health and Exercise Science. Content includes leadership and motivation models, legal liability, ethical considerations and management strategies for all aspects of Health Care Administration. A-F only. Pre: 415 or consent.

**KLS 420 Lower Extremity Assessment (3)** An examination of the pathology of injuries to the lower extremities and their care and treatment designed for Athletic Training, Exercise Science and Allied Health professionals. A-F only. Pre: 353, 415, PHYL 141, PHYL 142; or consent.

**KLS 421 Upper Extremity Assessment (3)** An examination of the pathology of injuries to the upper extremities and their care and treatment designed for Athletic Training, Exercise Science and Allied Health professionals. A-F only. Pre: 353, 415, 420, PHYL 141, PHYL 142; or consent.

**KLS 423 Curriculum and Supervision (3)** Effective program development, planning, and

supervision, including issues in legal liability and administration of all aspects of physical education programming in grades K–12. Repeatable one time. A-F only. Pre: 270; or consent. Majors only.

**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 429 Evaluating and Marketing Leisure 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. A-F only. Pre: 208 and 329 (or concurrent); or consent.

**KLS 432 Emergency Care for the Professional Rescuer (3)** Combined lecture-lab course on advanced emergency care for injuries and illnesses and includes certifications for CPR/First Aid/AED. Class size of approximately 20 students. Open to all majors. A-F only. Pre: 332 or consent.

**KLS 434 Coaching Athletics and Officiating (3)** Combined lecture-lab course with emphasis on scientific training principles, theory and practice, professional qualities of the coach; and techniques of officiating. A-F only. Pre: consent. Spring only.

**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 field trips. 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; relationships among school/community/agency providing special programs and services. Pre: SPED 404, or consent. (Cross-listed as SPED 443)

**KLS 463 Sport Biomechanics (3)** Concepts and scientific principles essential to efficient human movement; proper application of biomechanical principles to fundamental movements and selected complex motor skills. A-F only. Pre: 353, MATH 140 and PHYS 100; or consent. DB

**KLS 471 K-12 Teaching Methods in Health (3)** Experiences in developing standards-based, interactive learning opportunities to teach personal and social skills for health in schools. Focus on National and Hawai'i Health Content Standards, priority risk/content areas, the Coordinated School Health Program, and responsibilities and competencies. A-F only. Pre: 195, admission to College of Education, or consent. Fall only.

**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: EDEP 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 478 Adapted PE in Early Childhood (3)** Concepts of developmentally appropriate practice, importance of movement in overall development, and design of physical education for young children with and without disabilities. Planning physical education for this age group is also included. Pre: 443, 477 (or concurrent) or consent.

**KLS 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. (Cross-listed as FSHN 480)DB

**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, 353 and consent.

**KLS 487 Exercise Assessment and Conditioning Lab (4)** A course designed to provide knowledge of laboratory techniques and procedures for aerobic and anaerobic fitness assessment, interpretation of aerobic and

anaerobic testing results, and individual exercise program/prescription. A-F only. Pre: 480, and EDEP 429; or consent. Fall only.

**KLS 488 Internship: Physical Fitness Assessment (4)** Application of various testing procedures on human subjects with different physical capacities. Pre: 487.

**KLS 489 Program Design Strength Training (3)** A course designed to provide theoretical and practical experience in supervision of a strength training center. Content includes program design, exercise techniques, organization, testing, evaluation, methods of strength development, facility design and special populations. A-F only. Pre: 152 and 153; or consent. Fall only.

**KLS 493 Athletic Training Practicum III (1)** Advanced-level supervised experiences within the profession of athletic training. This practicum is a requirement for entry to the KLS Master's Athletic Training Program. A-F only. Pre: 393, 394, 415, 419 or consent.

**KLS 494 Athletic Training Practicum IV (1)** (5 2-hr Practicum) Advanced-level supervised experiences within the profession of athletic training. This practicum is a requirement for entry to the KLS Master's Athletic Training Program. A-F only. Pre: 393, 394, 415, 419, 420, 493 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 instruction. 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: ANAT 301 and 302, or PHYL 301 and 302, or PHYL 401. (Cross-listed as PHYL 601)

**KLS 602 Metabolic Analysis (3)** Theory and practice of metabolic analysis of human performance examining each of the power systems used in energy production during exercise and how to use this information to prescribe exercise programs. Pre: 480, 601, graduate standing; or consent.

**KLS 603 Advanced Theories of Fitness and Human Movement (3)** Scientific laws and principles relevant to man's physical and social environment in relation to physical fitness and human movement. Pre: 203; or consent.

**KLS 604 Body Composition and Weight Management (3)** Analysis of the theory and practice used in the assessment of body composition and human physique. Includes strategies for implementing changes in body composition. Pre: 480, 601, graduate standing; or consent.

**KLS 605 Social Psychological Aspects of Youth Sports and Leisure (3)** Survey of advanced theory and practice in youth sports and

leisure science. Research in area selected by student. Preparation and presentation of research paper. The seminar will focus on the study of social and psychological concepts concerning youth sport and leisure behavior in various settings. Repeatable one time.

**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 607 Scientific Principles of Physical Conditioning (3)** Application of physiological principles to physical conditioning and athletic performance. Pre: graduate standing or consent.

**KLS 608 Muscular Strength and Power Development (3)** Interpretation of scientific principles of muscular strength and power development. Examination of muscular adaptations to increased and decreased use. Pre: graduate standing or consent.

**KLS 609 Athletic Training, Clinical I (3)** (1 Sem, 5 3-hr Practicum) Practicum in which the student will perform the duties and responsibilities of a student athletic trainer. This practicum is to be completed during the first semester post admission into the program. A-F only. Pre: ANAT 301, ANAT 301L, ANAT 302, ANAT 302L, KLS 393, KLS 394, KLS 415, KLS 419, KLS 420, KLS 421, KLS 493, KLS 494, or consent.

**KLS 610 Athletic Training, Clinical II (3)** (1 Sem, 5 3-hr Practicum) Practicum in which the student will perform the duties and responsibilities of a student athletic trainer. This practicum must be completed during the second semester post admission to the program. A-F only. Pre: ANAT 301, ANAT 301L, ANAT 302, ANAT 302L, KLS 393, KLS 394, KLS 415, KLS 419, KLS 420, KLS 421, KLS 493, KLS 494, KLS 609, or consent.

**KLS 611 Athletic Training, Clinical III (3)** (1 Sem, 5 3-hr Practicum) Culminating practicum in which the student will perform the duties and responsibilities of a second year graduate student athletic trainer. A practical field experience in athletic training will be required. A-F only. Pre: ANAT 301, ANAT 301L, ANAT 302, ANAT 302L, KLS 393, KLS 394, KLS 415, KLS 419, KLS 420, KLS 421, KLS 493, KLS 494, KLS 609, KLS 610, or consent.

**KLS 612 Athletic Training, Clinical IV (3)** (1 Sem, 5 3-hr Practicum) Culminating practicum in which the student will perform the duties and responsibilities of a second year graduate student athletic trainer. A practical field experience in athletic training will be required. A-F only. Pre: ANAT 301, ANAT 301L, ANAT 302, ANAT 302L, KLS 393, KLS 394, KLS 415, KLS 419, KLS 420, KLS 421, KLS 493, KLS 494, KLS 609, KLS 610, KLS 611, or consent.

**KLS 613 Athletic Training, Clinical V (3)** (1 Sem, 5 4-hr Practicum) Advanced practicum in which the NATA certified graduate student athletic trainer will work with interscholastic or inter collegiate athletic teams at a high school, college, or university. Certification eligible graduate students will perform athletic training duties under the supervision of a NATA certified athletic trainer. A-F only. Pre: ANAT 301, ANAT 301L, ANAT 302, ANAT 302L, KLS 393, KLS 394, KLS 415, KLS 419, KLS

420, KLS 421, KLS 493, KLS 494, KLS 611, KLS 612, or consent.

**KLS 614 Athletic Training, Clinical VI (3)** (1 Sem, 5 4-hr Practicum) Advanced practicum in which the NATA certified graduate athletic trainer will work in an allied health or research setting. A-F only. Pre: ANAT 301, ANAT 301L, ANAT 302, ANAT 302L, KLS 393, KLS 394, KLS 415, KLS 419, KLS 420, KLS 421, KLS 493, KLS 494, KLS 611, KLS 612, or consent.

**KLS 615 Head, Neck, and Spine Evaluation (3)** (2 Lec, 1 3-hr Lab) Examination, care and treatment of neurological/neuromuscular conditions and pathology of the head, neck, spine, and trunk. Pre: ANAT 301, ANAT 301L, ANAT 302, ANAT 302L, KLS 393, KLS 394, KLS 415, KLS 419, KLS 420, KLS 421, KLS 493, KLS 494, or consent.

**KLS 616 Advanced Orthopedic Assessment (3)** (2 Lec, 1 3-hr Lab) Advanced knowledge and skills of athletic training as they are specifically applied to the understanding, treatment, and rehabilitation of sport-related injuries. (e.g. epidemiology, legal, ethical concerns, sports psychology, pharm, drug abuse, health issues) Pre: ANAT 301, ANAT 301L, ANAT 302, ANAT 302L, KLS 393, KLS 394, KLS 415, KLS 419, KLS 420, KLS 421, KLS 493, KLS 494, or consent.

**KLS 617 Therapeutic Modalities (4)** (3 Lec, 1 3-hr Lab) The physiology principles and operational procedures and operational procedures of contemporary Therapeutic modalities as they related to the care and treatment of athletic injuries. Pre: ANAT 301, ANAT 301L, ANAT 302, ANAT 302L, KLS 393, KLS 394, KLS 415, KLS 419, KLS 420, KLS 421, KLS 493, KLS 494, or consent.

**KLS 618 Therapeutic Exercise (4)** (3 Lec, 1 3-hr Lab) Concepts and principles of comprehensive rehabilitation programs (e.g. therapeutic goals and objectives, exercise selection, methods of evaluation and recording progress, progression and return to competition criteria, and the physiological effects of tissue trauma and inactivity). Pre: ANAT 301, ANAT 301L, ANAT 302, ANAT 302L, KLS 393, KLS 394, KLS 415, KLS 419, KLS 420, KLS 421, KLS 493, KLS 494, or consent.

**KLS 619 General Medical Conditions in Sports Medicine (3)** An examination/evaluation of general medical conditions associated with sports medicine including pathology, care and treatment. Pre: PHYL 301, 302 or consent. Major restriction: KLS Athletic Training.

**KLS 620 Seminar in Athletic Training (1)** This course is designed to provide the student with analytical skills and practical experience relative to research as it applies to sports related injuries. Repeatable five times. Pre: ANAT 301, ANAT 301L, ANAT 302, ANAT 302L, KLS 393, KLS 394, KLS 415, KLS 419, KLS 420, KLS 421, KLS 493, KLS 494, or consent.

**KLS 623 Administration in Kinesiology (3)** Current problems, trends, and strategies in the administration of physical education, recreation, sport and fitness programs in school and non-school settings. Pre: 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: consent. (Cross-listed as EDCS 634)

**KLS 640 Seminar in Physical Education (3)** Trends, research, and problems in instruction in physical education. Pre: 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 EDCI 632 (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: consent. (Cross-listed as TECS 643)

**KLS 663 Biomechanics of Human Motion (3)** Principles of motion as applied to sport and physical rehabilitation. Introduction to the technology used in the analysis of motion. Pre: consent.

**KLS 664 Clinical Biomechanics (3)** Study of mechanics and pathomechanics of human movement. Course will focus on biomechanical principles as applied to structure and function of each body region, with emphasis on clinically relevant issues associated with each body region. Pre: 663 or consent. Co-requisite: 663.

**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: TECS 632 or EDEP 601 (or concurrent).

**KLS 674 Assessment in Physical Activity (3)** Overview of assessment purposes, types, practices and procedures used in physical education for those with disabilities. Frequently used motor assessments and practices in collection of data will be specifically addressed. Pre: 404e, 405, 406, 474, 634 (or concurrent) or consent. Spring only.

**KLS 675 Transdisciplinary Approach to Teaching the Motor Domain (3)** Highlights a transdisciplinary approach for effectively teaching students with disabilities in the motor domain. Important characteristics and components of this approach will be shared. Strategies for its implementation will also be addressed. Pre: 390, 391, 640, SPED 444 (or equivalent), or consent.

**KLS 699 Directed Reading and/or Research (V)** Individual reading and/or research. Pre: consent of instructor and department chair.

**KLS 700 Thesis Research (V)** Research for Master's thesis.

## 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 in the prerequisite courses is required for continuation.*

**KOR 101 Elementary Korean (4)** Listening, speaking, reading, writing, grammar. Meets one hour, four times a week, plus lab work. Pre: placement test and consent. **HSL**

**KOR 102 Elementary Korean (4)** Continuation of 101. Pre: 101 or consent. **HSL**

**KOR 111 Elementary Conversational Korean I (3)** The purpose of this course is to offer the student the basic knowledge (listening, speaking and grammar) of spoken Korean, and to train the student to handle some familiar everyday topics. Pre: consent. **HSL**

**KOR 112 Elementary Conversational Korean II (3)** Continuation of 111. Pre: 111 or consent. **HSL**

**KOR 201 Intermediate Korean (4)** Continuation of 101 and 102. Meets one hour, four times a week, plus lab work. Pre: 102 or placement test; or consent. **HSL**

**KOR 202 Intermediate Korean (4)** Continuation of 201. Pre: 201 or placement test; or consent. **HSL**

**KOR 211 Intermediate Conversational Korean I (3)** The purpose of this course is to further strengthen the student's listening and speaking skills in Korean. The student is expected to be able to comprehend and produce speech at the paragraph level. Pre: 112 or consent. **HSL**

**KOR 212 Intermediate Conversational Korean II (3)** Continuation of 211. Pre: 211 or consent. **HSL**

**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 307 Readings in Chinese Characters (3)** Training intermediate and advanced learners of Korean to master the reading, writing and usage of some 500 basic Chinese characters as they are used in a wide variety of Korean reading texts. Once a year. Pre: 202 (or concurrent), 301 and departmental approval.

**KOR 332 Advanced Korean Reading and Writing (3)** Web-based training in Korean reading and writing to develop skills at the advanced level. Course activities combine independent work with communicative activities on the web site. Ideal for preventing language attrition at advanced level. Repeatable one time. Pre 301 (or concurrent) 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. CR/NC only. Repeatable. Pre: consent.

**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 one time. Pre: 402 or consent.

**KOR 451 Structure of Korean (3)** Introduction to phonology, morphology, and history. Pre: 302 or consent.

**KOR 452 Structure of Korean (3)** Introduction to syntax and semantics. Pre: 302 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. **DL**

**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. **DL**

**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. **DL**

**KOR 480 Korean Oral Proficiency Through Film (3)** Designed for students who try to elevate their proficiency level from Advance to Superior by challenging themselves to understand culturally-very-rich text (i.e., Korean film). Increasing Korean proficiency and deepening cultural awareness are main objectives. Pre: 402 or concurrent with 470, or consent.

**KOR 481 Selected Readings in Korean (3)** Selected readings in various disciplines. Repeatable one time with consent. Pre: 402 or consent.

**KOR 485 (Alpha) Korean for Career Professionals (3)** Combined lecture-conference course on functional command of various discourse-level features in Korean in domain of (B) economics; (C) political science; (D) computer science; (E) engineering; (F) travel industry management; (G) business; (H) law; (I) medicine; (J) nursing and public health, and (K) others. Repeatable one time. Pre: 402 or diagnostic assessment procedures or consent.

**KOR 486 (Alpha) Korean for Academic Purposes (3)** Content course taught in Korean by professional school Korean faculty and flagship instructor in domain of (B) economics; (C) political science; (D) computer science; (E) engineering; (F) travel industry management; (G) business; (H) law; (I) medicine; (J) nursing and public health, and (K) others. Repeatable one time. Pre: 485 or diagnostic assessment procedures or consent.

**KOR 495 Internship Program (V)** Supervised internship with Korean professional hosts on O'ahu. Students will also attend an on-campus preparatory and follow-up language class. A-F only. Pre: 486, diagnostic assessment procedures, or consent.

**KOR 496 Korean Abroad (V)** Supervised internship with Korean professional hosts in Korea. Students also undergo a one-week training module designed to prepare them to maximize the benefits of the overseas internship. A-F only. Pre: 495, diagnostic assessment procedures, 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. CR/NC only. 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., *hyangga*, *changga*, *hanshi*, *sijo*, *kasa*, free form): (M) modern; Pre: 464 or consent (T) traditional; Pre: 463 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: 463 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: 463 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 632 Korean Phonology and Morphology (3)** Review of Korean vocalic and consonantal phonology. Phonological and morphological analysis of Korean derivation and inflection. 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 634 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 635 Pedagogy of Teaching Korean as a Second Language (3)** Identification and analysis of major problems in Korean language learning, teaching, testing, and materials development by examining theoretical issues and conducting classroom research; practical techniques of teaching and testing skills in listening, reading, speaking, writing and culture. Pre: 451 and 452; 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: 463 and 464, or consent.

**KOR 645 Research in Korean Language Acquisition (3)** Integrating the conceptual aspects of statistics and scientific analysis of human language behavior into the study of Korean as a foreign language. Pre: 635 or consent. (Alt. years)

**KOR 655 Practicum: Teaching Korean as a Second Language (3)** Designed for graduate students pursuing Korean language teaching, while developing practical teaching skills through class observation, action research and discussion under supervision. Pre: 635 or consent. (Alt. years)

**KOR 699 Directed Research (V)** CR/NC only. 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.

## Languages and Literatures of Europe and the Americas (LLEA)

*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

**LLEA 122 Greek and Roman Mythology (3)** Principal myths of Greek and Roman literature. **DL**

**LLEA 123 Greek and Latin Elements in English (3)** Important roots, prefixes, and suffixes for building a literary vocabulary.

**LLEA 124 Greek and Latin Elements in Scientific Terminology (3)** Important roots, prefixes, and suffixes for building a scientific vocabulary.

**LLEA 227 Introduction to Greek Literature (3)** Major writers: emphasis on Homer, drama, and philosophy. **DL**

**LLEA 228 Introduction to Roman Literature (3)** Major writers: emphasis on Vergil, satire, and novel. **DL**

### FRENCH

**LLEA 237 French Film (3)** Study of French film history and technique. A-F only. Pre: freshman standing. **DH**

**LLEA 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. **DH**

**LLEA 335 French Literature Since 1800 (3)** Rapid reading in translation; lectures, discussions, reports. Pre: junior standing or one course in French language or literature. **DL**

**LLEA 336 French African Literature (3)** Black African literature in French in 20th century. Major themes of negritude, national political unity, colonialism, traditional culture. Pre: junior standing or one course in French language or literature. **DL**

**LLEA 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. **DL**

**LLEA 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. **DH**

### GERMAN

**LLEA 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. **DH**

**LLEA 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. **DL**

**LLEA 342 German Expressionism (3)** Search for the “new man” after World War I. Readings in shorter prose, drama, and lyric poetry. **DL**

**LLEA 343 Modern German Literature (3)** Perspective of reality and poetic representations in the 20th century, including influences from Oriental and Eastern philosophy. **DL**

**LLEA 410 German Idealism (3)** Origin, impact in other disciplines and movements. Readings from Fichte, Schelling, Hegel, etc. Pre: PHIL 100. **DH**

### ITALIAN

**LLEA 236 Italian Film (3)** Study of Italian film history and technique. A-F only. **DH**

**LLEA 334 Italian 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. A-F only. Pre: sophomore standing or consent. **DL**

### RUSSIAN

**LLEA 150 Russia in Global Perspective (3)** Examines the contacts and cultural interplay of Russia with the peoples and nations of the Americas, Asia, Africa, Europe and Oceania.

**LLEA 350 Russian Short Story (3)** Origin and development (19th and 20th century); periods, themes, styles, and major authors. Pre: sophomore standing or consent. **DL**

**LLEA 351 19th-Century Russian Literature (3)** Survey in English of major writers from Pushkin through Chekhov; lectures, discussions, short papers. Pre: sophomore standing or consent. **DL**

**LLEA 352 Russian Literature 1900–1950 (3)** Survey in English of major Russian writers from 1900–1950. Pre: sophomore standing or consent. **DL**

**LLEA 353 20th-Century Russian Arts and Culture (3)** Aspects of culture (literature, film, theater, music, arts, etc.) in 20th-century

Russian society. Pre: 6 credit hours from HIST 151 and 152; or consent. **DH**

**LLEA 354 Russian Literature Today (3)** Survey in English of contemporary authors and their works for perspective of reality and poetic representation. Pre: sophomore standing or consent. **DL**

**LLEA 355 Russian Film (3)** A study of Russian film from the 1920's to the present. Pre: sophomore standing or consent. **DH**

#### SPANISH

**LLEA 360 (Alpha) Studies in Culture (3)** Politics of culture and representation. Will consider issues, traditions, movements, texts, and cultural icons for their significance for national and regional identity formation, intercultural relations and global flows of images, people, and capital. (B) Latin America; (C) Iberian Peninsula. Repeatable one time. Pre: sophomore or consent. **DH**

**LLEA 361 Spanish Literature in Translation (3)** Reading and discussion of classic works of Spanish literature. Pre: sophomore standing or consent **DL**

**LLEA 362 Latin American Literature (3)** Reading and discussion of classic works of Latin American literature. Pre: sophomore standing or consent. **DL**

**LLEA 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: sophomore standing or consent. **DH**

**LLEA 365 Spanish Film (3)** A chronological survey of films from Spain, from the Silent Era to the present. Conceptually, a cultural history of Spain in the 20th Century, as seen through films. Pre: sophomore standing or consent. **DH**

**LLEA 366 Latin American Film (3)** A chronological survey of films from Latin America, from the Silent Era to the present. Conceptually, a cultural history of Latin America in the 20th Century, as seen through films. Pre: sophomore standing or consent. **DH**

#### GENERAL AND GRADUATE COURSES

**LLEA 270 Freaks and Monsters (3)** Monsters, freaks and otherness in literature, film, history and medicine. Suitable for non-literature majors. **DL**

**LLEA 305 Ancient Egyptian Hieroglyphics I (3)** Decipherment of hieroglyphs and reading of Middle Egyptian literary texts.

**LLEA 371 Europeans in the Pacific (3)** European presence in the Pacific, in relation to literature, art, culture, civilization. Not applicable to language requirement. (*Section 1 taught in Hawaiian. Pre: HAW 202 or consent. Section 2 taught in English.*) **DL**

**LLEA 372 (Alpha) Indigenous Peoples of Latin America (3)** Survey of the history and culture of the indigenous peoples of Latin America through a study of their literature, texts and practices. (B) Mesoamerica; (C) Andean South America. Repeatable one time in different alphas. **DH**

**LLEA 375 International Film Criticism (3)** Focus on critical approaches to film (i.e., Historicism, Marxism, Feminism, Psychoana-

lytic Theory, Post-colonialism, and Queer Theory, among others) as well as basic film terms and concepts. Repeatable one time. Pre: sophomore standing or consent. (Cross-listed as ENG 363) **DH**

**LLEA 376 (Alpha) History of World Cinema (3)** Film as a reflection of the 20th Century's social, cultural and political upheavals: (B) World Cinema (1890s to 1950s); (C) World Cinema (1960s to present). Pre: sophomore standing or consent. **DH**

**LLEA 380 Studies in Luso-Brazilian Culture (3)** Course surveys the cultures of the Portuguese-speaking world from pre-Lusitanian to modern times, including connections with Africa, Asia, the U.S., and Hawai'i. Pre: sophomore standing or consent.

**LLEA 468 Colonial Latin American History (3)** Pre-Columbian civilizations: Spanish and Portuguese colonization; political, economic, social and religious evolution to 1810; independence. Pre: 360 or consent. (Cross-listed as HIST 478) **DH**

**LLEA 470 Freaks and Monsters 2: The Ethics of Otherness (3)** An interdisciplinary examination of corporeal Otherness. Unusual real and fictional bodies from fairground history, art, anatomy, literature, natural history and ethnology. Discussion of the moral, medical, philosophical and aesthetic dilemmas of spectacular difference. Pre: 270 or consent. **DH**

**LLEA 471 (Alpha) Fantasy and the Fantastic (3)** Cross-cultural study of fantasy and the fantastic in short stories, fairy tales, films and novels from Europe and the Americas in English translation. Discussion of illusion, identity, time, the future, the bizarre and major concepts in fantasy literature. (B) fairies, devils and fantasy; (C) the fantastic, the strange and science fiction. Repeatable one time (different alpha letter). Pre: 270 or consent. **DL**

**LLEA 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. **DL**

**LLEA 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. **DL**

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

**LLEA 630 Seminar in Research Methods (3)** Study of basic research methods and tools, including technology. Print and electronic source materials. Information literacy. A-F only. Pre: graduate standing or consent.

**LLEA 671 Western Literature and Cultures in the Pacific (3)** Impact of and reaction to western writings and cultural influences in the Pacific as represented in texts from the 16th century to the present. Pre: graduate standing or consent.

**LLEA 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.

**LLEA 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.

**LLEA 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.

**LLEA 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.

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

**LLEA 700 Thesis Research (V)**

#### LANGUAGE COURSES

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

**LLEA 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.

**LLEA 499 Directed Reading and Research (V)** Independent study of approved reading and research with faculty supervision. Repeatable two times. A-F only. Pre: consent and departmental approval.

Languages, Linguistics, and Literature (LLL)

College of Languages, Linguistics and Literature

**LLL 150 Literature and Social Change (3)** Study of works produced in Africa, the Americas, Asia, Europe, and Oceania from prehistory to the present, showing how the spoken and the written word reflect and effect social change. A-F only.

**LLL 451 Learning Communities Online and Practical Aspects of Teaching (1)** Online course for pre- or in-service teachers of world languages. Topics include online learning environments, creating online communities, curriculum and lesson planning, and assessment. Maximum enrollment of 20. Not open to those who have taken 455. A-F only.

**LLL 452 Social Aspects of Learning and Technology in the Classroom (1)** Online course for pre- or in-service teachers of world languages. Topics include processes of language teaching and learning, learner characteristics and

technology in the classroom. Maximum enrollment of 20. Not open to those who have taken LLL 455. Pre: 451 or concurrent. A-F only.

**LLL 453 Second Language Acquisition Theory and Methods (1)** Online course for pre- or in-service teachers of world languages. Topics include terminology of language teaching and learning and overview of historical and current approaches. Maximum enrollment of 20. Not open to those who have taken 455. Pre: 451 or concurrent. A-F only.

**LLL 455 Second Language Learning and Technology (3)** Online course for pre- or in-service teachers of world languages. Combines content from 451, 452 and 453. Maximum enrollment of 20. Not open to those who have taken 451, 452 or 453. A-F only.

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## Lao (LAO)

*College of Languages, Linguistics and Literature*

**LAO 101 Elementary Lao (4)** Listening, speaking, reading, writing. Structural points introduced inductively. Daily lab work. **HSL**

**LAO 102 Elementary Lao (4)** Continuation of 101. **HSL**

**LAO 112 Intensive Elementary Lao (10) HSL**

**LAO 201 Intermediate Lao (4)** Continuation of 102. Daily lab work. Pre: 102 or equivalent. **HSL**

**LAO 202 Intermediate Lao (4)** Continuation of 201. **HSL**

**LAO 212 Intensive Intermediate Lao (10) HSL**

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## Latin (LATN)

*College of Languages, Linguistics and Literature*

**LATN 101 Elementary Latin (3)** Grammar and vocabulary, with reading of simple Latin. **HSL**

**LATN 102 Elementary Latin (3)** Continuation of 101. Pre: 101. **HSL**

**LATN 201 Intermediate Latin (3)** Development of reading and translation skills. Emphasis on prose. Pre: 102 or equivalent. **HSL**

**LATN 202 Intermediate Latin (3)** Continuation of 201: emphasis on poetry. Pre: 201. **HSL**

**LATN 303 Roman Historians (3)** Selections from Caesar, Sallust, and others. Pre: 201 and 202, or consent. **DL**

**LATN 304 Roman Epic (3)** Selections from Virgil, Ovid, and others. Pre: 201 and 202, or consent. **DL**

**LATN 325 Roman Philosophy (3)** Selections from Lucretius, Cicero, and Seneca. Pre: 201 and 202, or consent. **DL**

**LATN 332 Roman Drama (3)** Selections from Plautus, Terence, and Seneca. Pre: 201 and 202, or consent. **DL**

**LATN 333 Roman Lyric (3)** Selections from Catullus, Horace, and others. Pre: 201 and 202, or consent. **DL**

**LATN 338 Roman Novel (3)** Selections from Petronius and Apuleius. Pre: 201 and 202, or consent. **DL**

**LATN 345 Roman Satire (3)** Selections from Horace and Juvenal. Pre: 201 and 202, or consent. **DL**

**LATN 490 Seminar in Roman Studies (3)** Study of an author or phase in Roman studies. Repeatable. Pre: any two 300-level Latin courses, or consent.

**LATN 651 Seminar in Roman Literature (3)** Study of an author, genre, period, or work. 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.

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## Law (LAW)

*School of Law*

**LAW 501 Pre-Admission Seminar (V)** Special seminar for pre-admission program students designed to develop analytical, research and communications skills in the context of the substantive law courses in which they are concurrently enrolled. Credits in this seminar do not count toward requirements for the JD degree. CR/NC only.

**LAW 502 Pre-Admission Seminar (V)** Special seminar for pre-admission program students designed to develop analytical, research and communications skills in the context of the substantive law courses in which they are concurrently enrolled. Credits in this seminar do not count toward requirements for the JD degree. CR/NC only.

**LAW 503 Wildlife and Natural Resources 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)** This course introduces students to the process and resources of legal research. Students will be introduced to print and electronic resources. Classroom sessions and library exercises help students develop the strategies and skills to become effective researchers.

**LAW 507 Employment Discrimination (3)** A study of the law of employment discrimination.

**LAW 508 Negotiation and Alternative Dispute Resolution (V)** Lawyers negotiate settlements in almost all their cases. This class presents a "hands-on," skill-building approach to the newest ideas, as well as centuries-old

techniques, about the skill lawyers will use most often in their private practice - negotiation. The class also examines the rapidly developing field of alternative dispute resolution (ADR), including mediation, facilitation, arbitration, and court-annexed ADR. (Cross-listed as CEE 614)

**LAW 509 Contracts I (3)** Law of private agreements. Explores the evolution and application of common law doctrines, and, where applicable, relevant provisions of the Uniform Commercial Code. Examines the bases of promissory liability, contract formation, mutual assent, defenses to enforcement, excuses, remedies and damages, and the rights and interests of third parties. Attention will be paid throughout the course to the role of contracts in a market society and the conflicting interests of certainty, freedom of contract and fairness. Fall only.

**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 (V)** Introductory consideration of selected topics relating to functions, structure, and responsibilities of the legal profession and its future role in society. CR/NC only.

**LAW 512 Environmental Compliance and Regulated Industries (V)** In depth study of the federal and state environmental laws that impact modern businesses and industries, and exploration of the compliance issues that arise under the statutes, regulations and case law.

**LAW 513 Criminal Justice (4)** Examination of substantive rules, enforcement procedures, and rationales of criminal law in the United States

**LAW 514 Law and Society in Japan (V)** An extended historical review of the foundations 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 lawyering. 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 I (V)** Basic course in property ownership, development, regulation. Emphasis on theory.

**LAW 519 Real Property II (3)** Contract of sale, equitable conversion, deed. Pre: 518.

**LAW 520 Advanced Legal Studies (V)** Faculty members or visiting scholars present selected topics focusing upon subject areas in their area of specialty or expertise. Recent topics have included Gender and Law, Indigenous People's Rights, and Art and Law.

**LAW 521 Elder Law (V)** Introduction to the myriad legal issues that confront the elderly in our society such as age discrimination, elder abuse, estate planning, entitlement to government benefits, guardianship alternatives to guardianship and health care decisions, including end-of-life decisions.

**LAW 522 Torts I (2)** Introduction to law, policy of civil recovery for injury, process of tort law application.

**LAW 523 Torts II (3)** Continuation of 522. Intentional torts, nuisance, defamation, privacy, and misrepresentation. Pre: 522.

**LAW 524 Advanced Torts and Insurance Law (V)** Advanced study of several areas of tort law and an introduction to insurance law and policy. This course is of considerable importance to students interested in civil litigation and personal injury law. Recent important developments in Hawai'i tort and insurance law will be included.

**LAW 525 Business Planning (2)** This course integrates corporate, business and securities law principles and practices with an introduction to corporate and partnership taxation. Pre: 531. Recommended: 567. Spring only.

**LAW 526 Group Directed Study (V)** Designed for 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 (V)** 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 Business Associations (V)** After a brief survey of agency, partnerships, and other forms of business organization, the course will cover the fundamentals of corporations, and securities regulation, including disregarding the corporate entity, management and control of closely held corporations, merger, liability under the federal securities laws, takeovers, public registration, exemptions, and derivative suits.

**LAW 532 Health Law (3)** Introduction to medical jurisprudence, medical malpractice, informed consent, health care decisions, medical ethics, the health care industry, managed care, financing health care, 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)** A study of the law relating to property rights resulting from intellectual effort, including patents, copyright, trademarks, and trade secrets. While the course attempts to provide a unified background in theory and policy for all fields of intellectual property, it emphasizes areas of importance to the general practitioner. Accordingly, the doctrines and policies of the patent system are studied primarily for the light they shed upon the nature of intellectual property protection as a whole and upon the interaction between federal and state law.

**LAW 536 (Alpha) Moot Court Team (1)** An honors program for students who prepare for and compete in national advocacy. Repeatable one time. CR/NC only. (C) client counseling team; (E) environmental law moot court team; (H) Native American moot court team; (J) Jessup international moot court team; (O) other. Pre: selection by competition.

**LAW 537 Moot Court Board (1)** An honors program for students who organize the Fall semester intramural Moot Court competition, serve as teaching assistants to Appellate Advocacy professors in the Spring, and assist in the Moot Court program. 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 (V)** This course principally examines both practice aspects and theoretical underpinnings of equitable remedies. Frequently, compensatory damages cannot adequately protect clients or provide them with the relief they need. Topics include temporary restraining orders, preliminary and permanent injunctions, restitution and unjust enrichment, specific performance, and equitable defenses such as unclean hands, laches, and estoppel. Practice issues concerning appeal, jury trials, and the relationship of equity to law are also explored.

**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)** "Objection, your Honor!" This course examines the rules of evidence that govern trials in both federal and Hawai'i courts and will focus on such topics as hearsay, witness examination, impeachment, physical and demonstrative evidence, expert testimony, writings, relevance, judicial notice, and presumptions.

**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 Asian-Pacific Law Journal (1)** Students selected for the Asian-Pacific Law and Policy Journal editorial board have writing, researching, editorial and production responsibility for publication of the Journal. Repeatable five times. CR/NC only.

**LAW 547 Gender and Law (2)** This course will apply legal analytic skills to materials showing the ways in which Anglo-American legal traditions and systems deal with women and women's roles, examining how society views women and women's roles, and how that view affects the ultimate de jure and de facto legal status of women comparing with other legal cultures in Asia, the Pacific, and Hawai'i where appropriate. Repeatable one time. Pre: 533.

**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.

**LAW 550 Corporate and Partnership Taxation (3)** Examines tax aspects of formation, operation, reorganization, and liquidation of partnerships and corporations. Pre: 531, 567.

**LAW 551 Estate and Gift Taxation (V)** Students learn the basic rules of transfer taxation including those found in Chapters 11 (Estate Taxes), 12 (Gift Taxes), 13 (Generation Skipping Taxes), and 14 (Special Valuation Rules) of the Internal Revenue Code. Also, popular tax-oriented estate planning strategies are reviewed and applied to hypothetical facts. Pre: 2nd year law standing, 552; or consent. (Alt. years)

**LAW 552 Trusts and Estates (V)** The course deals primarily with the disposition of family

wealth including: the making of wills; the creation, enforcement, administration, and termination of trusts; and intestate succession, including probate. Attention is focused on Hawai'i practice and procedure, and particularly on practice under the Uniform Probate Code.

**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 556 Asian Comparative Labor Law (3)** Area studies of Asian legal systems and issues, focusing on administration of Asian labor laws in a comparative context. Possible effects on foreign direct investment and foreign migrant contract workers. Comparison of Chinese, Japanese and other legal approaches in dealing with common issues. Required research paper in lieu of examination.

**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 Corporate Finance (V)** This course provides an understanding of the basic financial concepts and tools for lawyers with transactional practices, preferred stock, common stock and convertible securities. Pre: or Concurrent: 531 or consent.

**LAW 559 Labor Law I (3)** Regulation of union-management relations under state and federal laws.

**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 Securities Regulation (V)** This course is an introduction to American securities regulation and focuses on the registration and reporting process required of public companies as well as securities litigation. Repeatable three times. Recommended: 531. Fall only.

**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 Introduction to American Law (V)** General introduction to the fundamental principles and distinctive aspects of the American legal system and its institutions. Pre: LL.M. students only. C/NC only. Fall only.

**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: 533.

**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 business and commercial law in the People's Republic of China. After a brief overview of China's political and legal systems,

the course will examine basic areas of domestic business legislation, including torts, property, and contract law, the regulation of private business, the reform of state enterprises, the development of company and securities laws, and the regulation of land-use and other property rights. More specialized topics, such as arbitration and dispute resolution, the Chinese approach to intellectual property issues, or the use of joint ventures and other foreign investment vehicles, may also be included.

**LAW 579 International Business Transactions (V)** An examination of the law, rules, and practices relating to transborder commercial transactions. Roughly half of the semester focuses on international sales transactions, the remaining portion focuses on domestic and multinational governance of the international business arena. Repeatable one time.

**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 usufructs. 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 583 Real Estate Development and Financing (V)** Federal and state laws in the practice of real estate development and financing law. Condominium, securities, subdivision, consumer protection, and mortgage areas. Pre: 519.

**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, particularly as exemplified by the legal systems of East and Southeast Asia. After a brief review of comparative law study and the historical development of the civil law, the course will examine the structure and role of the courts, judicial process, the legal profession and 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 unionized employment relationship. Emphasis

on the labor arbitration process and possibly, to issues regarding internal union affairs.

**LAW 590 (Alpha) Workshops and Clinics (V)** (B) prosecution clinic; (C) defense clinic; (D) elder law clinic; (E) environmental law clinic; (G) estate planning workshop; (H) legal aid clinic; (I) native Hawaiian rights clinic; (J) family law clinic; (M) mediation clinic; (N) lawyering skills workshop; (P) mediation workshop; (Q) immigration clinic. Repeatable for (I) only. CR/NC only for (N), (P) and (Q). Pre: 543 for (B) and (C); 521 or consent for (D); 529 or 561 or 582 for (E); 552 and 567, or consent for (G); 568 or consent for (J); 548 for (Q). Fall only for (N).

**LAW 591 Government Contracts Law (3)** Introduction to Government Contracts Law is a primer on statutory, regulatory, and decisional laws that shape the government procurement process. This course covers contract relationships between private party contractors and Federal, State, and local governments. This course examines the federal acquisition process, bids and proposals, and contract award controversies before judicial and administrative tribunals. This course reviews socioeconomic contracting provisions and programs and Qui Tam litigation. Spring only.

**LAW 592 Domestic Ocean and Coastal Law (3)** Examination of the history of United States and Hawai'i sea-use law; comprehensive coverage of modern issues concerning the use of the sea including special Hawaiian problems.

**LAW 593 International Ocean Law (2)** Examination of the history of international sea-use law, including comprehensive coverage of modern problems and issues concerning the use of the sea among nations. Repeatable one time.

**LAW 594 Pacific Islands Legal Systems (V)** Study of substantive rules of one or more Pacific Islands jurisdictions, development of legal systems, relationship of legal systems to culture and tradition.

**LAW 595 Internet Law and Policy (3)** This course is a primer on the impact of the development and use of new technologies on global business and social culture. E-commerce, telecommunications, information technology, government regulation, and social policy have all been brought together by the use of the Internet. The revolutionary medium of the Internet has required legal practitioners to reassess the applicability of current laws and policies that protect and govern members of the global community. This class will explore the legal implications of the new global economy, copyright law in cyberspace, e-commerce, privacy, security, trademarks, domain names, tort liability, criminal activity, regulation in cyberspace, speech, and social and ethical issues.

**LAW 596 International Intellectual Property (V)** International Intellectual Property is a primer on the World Intellectual Property Organization and the treaties it administers. The course will explore the various international legislative and judicial developments in intellectual property as well as analyze international methods to harmonize several regional and national laws to protect rights in trademarks, patents, and copyrights. In addition, students will be exposed to issues of territoriality and jurisdiction, international antitrust issues, and international dispute resolution, and human

rights implications of international intellectual property rights protections.

**LAW 597 The Judicial Process (1)** This course is designed for students considering an externship with a judge or students interested in pursuing a judicial clerkship upon graduation. The course will examine the unique role of the judge in the American legal system as well as the role played by the extern or law clerk.

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## Library and Information Science (LIS)

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### *College of Natural Sciences*

**LIS 100 Libraries, Scholarship and Technology (3)** Use of libraries and information technology for scholarly investigation; examines information literacy, critical thinking, digital libraries, university role in knowledge creation. A-F only. (Cross-listed as CAS 101)

**LIS 100A Computer and Information in Arts and Humanities (3)** An introduction to computer application for students in arts and humanities. Includes coverage of computers in writing, information storage and retrieval, specific applications in arts and humanities disciplines.

**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.

**LIS 601 Introduction to Reference and Information Services (3)** Philosophy, principles and practice of reference services in libraries, information centers and information literacy. Bibliographic control, reference research, reference interview, online searching, evaluation of bibliographic and Webliographic material. Field component.

**LIS 605 Basic Cataloging and Classification (3)** Introductory cataloging and classification covering AACR2, Library of Congress and Dewey decimal classification systems, LC subject headings, use of OCLC.

**LIS 606 Advanced Cataloging and Classification (3)** Continuation of 605 with retrieval techniques from card to online catalogs, Precis,

extensive use of MARC, utilization of bibliographic utilities. Pre: 605 or consent.

**LIS 610 Introduction to Library and Information Science (3)** Lecture/discussion course on role of libraries, their social utility in information societies. History and future of libraries in changing technological world. Information professions, information ethics, intellectual freedom, intellectual property, information access, national/international library developments.

**LIS 612 History of Books and Libraries (3)** History of written communication: the recording, preservation and transmission of knowledge. Development of libraries through the mid-twentieth century as instruments of cultural transmission.

**LIS 615 Collection Management (3)** Principles and issues of collection management and care. Criteria and tools for selecting and deselecting materials. Relationships with publishers/producers.

**LIS 618 Government Documents (3)** Survey of government documents at the federal, state/local and international levels in all formats. Covers methods of acquisition and organization, including depository arrangements. Current issues of government information dissemination policies and practices discussed. Pre: 601 or consent.

**LIS 619 Conservation of Library Materials (3)** Nature of library materials and processes that cause their deterioration; procedures useful in combatting deterioration. Point of view of administrator rather than practitioner.

**LIS 620 Preservation Management (3)** Strategies for establishing preservation programs in libraries and archives, including planning, survey, disaster planning, grantsmanship, policy and power development. Pre: 619 or consent.

**LIS 642 Media Technology and Resources (3)** Overview of the use of media technology and the development of media collections and services in libraries. Use and integration of new emerging technologies, including problems and issues.

**LIS 647 Systems Analysis for Information Management (3)** Overview of systems analysis; its techniques, benefits and limitations. Focus on libraries and information agencies, although concepts are applicable to other settings. Structured, top-down solutions stressed throughout. Object oriented techniques and data modeling tools are reviewed. Pre: 670.

**LIS 650 Management of Libraries and Information Centers (3)** Basic theories and principles of administration for effective management of public, academic, and special libraries and information centers, with emphasis on planning, organizing, staffing, directing, and control. Administrative aspects of public and technical services, facilities, planning, evaluation, public relations, interagency cooperation, and the management of change in bureaucratic organizations.

**LIS 652 Introduction to Archives Management (3)** Study of archival principles and management theories applicable to all types of archives. Includes policy, appraisal, computer, and micrographic applications, ethical and legal issues.

**LIS 653 Seminar in Archival Studies (3)**

Theory of archival studies from historical and contemporary perspectives. Includes public administration, legislation, and relationship to other repositories. Pre: 652 or consent.

**LIS 660 Information Sources and Systems in Science (3)**

Bibliographical structure and sources in the basic and applied sciences, including physics, chemistry, biology, medicine, agriculture, engineering. Field component. Pre: 601 or consent.

**LIS 661 Information Sources and Systems in Humanities (3)**

Lecture course on information structures of humanities disciplines, including fine arts, applied arts, theater arts, literature, music, religion, philosophy. Information cycle, print and digital reference services, information seeking research in the humanities. Field research component. Pre: 601.

**LIS 662 Information Sources and Systems in Social Science (3)**

Lecture course on information structures of social science disciplines, including anthropology, sociology, psychology, education, business, history, political science. Information cycle, print and digital reference services, information-seeking research in the social sciences. Field research component. Pre: 670.

**LIS 663 Basic Database Searching (3)**

Introduces use of commercial online databases for interactive retrieval of bibliographic, full-text and directory information, the development of search strategies using controlled subject vocabulary queries and free text searching. Pre: 601.

**LIS 664 Abstracting and Indexing for Information Services (3)**

Lecture course on theory and practice of enhancing subject access to documents, impact of indexing vocabulary on retrieval; types of controlled vocabularies; evaluation of abstracts in professional databases, creation of abstracts for special local and regional documents. Pre: 670.

**LIS 665 Teaching Information Technology Literacy (3)**

Lecture/discussion course on history, theories, principles, practices and concepts of library and information literacy instruction, learning theory and user-based research methods. Examines program design, administration and evaluation. Field research component. Pre: 601.

**LIS 667 Advanced Database Searching (3)**

Lecture course with demonstrations of advanced features of online information retrieval systems and search engines, including natural language searching, citation-based searching, term mapping, similarity searching, result ranking and clustering for power search Web databases. Pre: 663.

**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: 663.

**LIS 670 Introduction to Information Science and Technology (3)**

Survey of topics in information science and technology. Lectures and discussions emphasize practice, problems and theory relating to information storage, retrieval and dissemination provision technology in libraries and information centers.

**LIS 671 Digital Librarianship (3)**

Lecture course discussing the essentials of digital librarianship: the types of digital collections, resources and finding tools available for information professionals, and the economic, management and legal issues related to digital libraries. Pre: 601 or consent.

**LIS 672 Tech for Libraries and Information Centers (3)**

Survey of theories, concepts, methods and practices relating to the application of information technology to support the administration and use of information resources. Includes digital, printed and audiovisual materials. Pre: 605, 670 or consent.

**LIS 673 Records Management (3)**

Management of records in all media formats. Selection of media format based on government and internal records requirements. Problems associated with electronic media such as legality and shelf life. Pre: 670 or consent.

**LIS 674 Database Design and Creation (3)**

Designing and creating textual and/or directory databases from the viewpoint of information specialists and content providers. Needs analysis, file design, record content and structuring, software choice. Students implement prototype database. Pre: 670.

**LIS 675 Database Content Evaluation (3)**

Lecture course discussing and demonstrating the principles and methods of using criteria in evaluating databases used by librarians and information professionals, such as database coverage, source base, currency, accuracy and quality of information. Pre: 601 or 670 or consent.

**LIS 676 Expert Systems for Library and Information Environment (3)**

Artificial intelligence applications. DBM pattern recognition, automatic indexing, user interfaces for integrated library systems. Pre: 670.

**LIS 677 Human Dimension in Information Systems (3)**

Lecture/discussion course on human element in information systems, including physical, cognitive and affective behavior in interaction with information systems. Information retrieval, human-computer interaction and cognitive science research, quantitative and qualitative research methods. Research component. Pre: 670.

**LIS 678 Personalized Information Delivery (3)**

Study of the components of personalized information systems: information filtering systems with emphasis on modeling and representation of documents, queries, user information preferences, and user-system interaction. Topics include advanced Information Retrieval (IR) models, metadata and markup languages, query operations, thesaurus based IR, acquisition of user profiles, and user/system performance evaluation. Pre: 647, 663, 670, 674, ICS 321, ICS 421, or ICS 624; or consent.

**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. Emphasis on building skills and support networks to help entry level professionals create effective school library programs. CR/NC only.

**LIS 681 Books and Media for Children (3)**

History and criticism of children's literature. Contemporary books and media. Trends in book publishing and media production. Developmental needs and interests of children. Selection and evaluation. Research studies.

**LIS 682 Books and Media for Young Adults (3)**

History and criticism of literature for young adults. Contemporary books and media. Trends in media for young adults. Developmental needs and interests of adolescents. Selection and evaluation. Research studies.

**LIS 683 Services in Libraries (3)**

Planning and implementing services and programming in public and school libraries. Trends, issues, networking, public relations, outreach, competencies, services for the disabled and other special groups.

**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 traditional literature including Asian and Pacific Island resources. Selection and evaluation of traditional literature emphasizing cultural values. Introduction to oral tradition, history and techniques of 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 Hawaiian Studies Information Resources (3)**

Survey of reference and research materials in Hawaiian studies. Includes historical and contemporary works, arts, humanities, social and natural sciences, media. Covers approaches to reference service, collection building and management.

**LIS 688 Pacific Islands Information Resources (3)**

Study of reference tools and bibliographic sources for Pacific Islands studies, including exam of online catalogs, databases and web sites. Focus on Melanesia, Micronesia and Polynesia (excluding Hawai'i).

**LIS 689 Asian-American Resources for Children and Youth (3)**

Study of Asian-American resources for young people: socio-historical roots, evaluation and selection, curricular and program uses in a multicultural context.

**LIS 690 Internship (3)**

Field experience in library or information agency settings with supervision of professional librarians or information specialists. Available to classified students only. Selection based on academic adviser approval, application form, interview and possession of required competencies. Students must apply and be accepted before registration. 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 critiquing proposals. Experience with statistical packages for data analysis.

**LIS 696 Practicum in Librarianship (V)** Skill 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 one time. 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 700 Thesis Research (V)** Research for master's thesis. Pre: 695.

**LIS 701 Seminar in International Librarianship (3)** International and comparative librarianship; professional organizations; comparative methodology; research; periodicals; international agencies; influence of 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 (3)** Public and organizational information policy and planning in society; public access; impact and issues of information technology and the Internet; privacy, security, globalization, intellectual freedom, copyright issues.

## Linguistics (LING)

*College of Languages, Linguistics and Literature*

**LING 100 Language in Hawai'i and the Pacific (3)** An introduction to the study of language and language-related issues, with a focus on Hawai'i and the Pacific. A-F only. **DS**

**LING 102 Introduction to the Study of Language (3)** Nature and workings of language; its role in culture and history. **DH**

**LING 103 Language and Symbolic Reasoning (3)** An introduction to language as a formal symbolic system and to the techniques of analysis and reasoning that reveal its workings. A-F only.

**LING 120 Language as a Window to the Mind (3)** Introduction to language-related phenomena, which gives insight into the organization of the human mind. Combines lecture, discussion and group projects.

**LING 170 The Language of Children (3)** Survey of findings about the child's acquisition of language. **DS**

**LING 320 General Linguistics (3)** Approaches, concepts, component areas of linguistics; its development as a science. **DS**

**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, "contact" languages. Variety of grammatical structures illustrated by selected languages. Pre: 320 or consent. **DS**

**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. **DS**

**LING 346 The Philippine Language Family (3)** Introduction; phonological and grammatical systems; historical developments; emphasis on Filipino, Cebuano, and Ilokano. Pre: 102 and a Philippine language or enrollment in Ilokano or Filipino, or consent. **DH**

**LING 347 Pidgin and Creole Languages (3)** Nature, history, structure, geographical distribution. Pre: 102 or consent. **DS**

**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. **DH**

**LING 412 Psycholinguistics (3)** The mental processes involved in producing, understanding, and acquiring language. Students will conduct a small psycholinguistic experiment. Open to nonmajors. Pre: one of 102, 320, PSY 100, or SPA 300; or consent. **DS**

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

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

**LING 416 Language as a Public Concern (3)** How does language serve as a proxy for larger social questions? This course focuses on four main themes: language revitalization, discrimination on the basis of accent, gender miscommunication and the English Only Movement. A-F only. Pre: 102, 320 or consent. **DS**

**LING 420 Morphology (3)** Theory of word structure; analysis of a variety of morphological types. Pre: 320 (or concurrent) or consent. **DH**

**LING 421 Introduction to Phonological Analysis (3)** Phonological analysis and theory. Pre: 410. **DH**

**LING 422 Introduction to Grammatical Analysis (3)** Syntactic analysis and grammatical theory. Pre: 320 or consent. **DH**

**LING 423 Cognitive Linguistics (3)** Conceptual systems and language from a cognitive science perspective. Linguistic evidence on conceptual structure, reasoning, categorization, and understanding. Open to nonmajors. Pre: 102, 320, PSY 100, or ICS 111; or consent.

**LING 430 Animal Communication (3)** Investigates animal communication from the perspective of modern linguistics. Dispels common misconceptions about "talking animals" and shows how the cognitive, biological, and environmental needs and opportunities of animals determine what and how they communicate. A-F only. Pre: 102 or consent. **DS**

**LING 431 Computational Modeling (3)** Hands-on introduction to modeling language. Focuses on connectionism, relations between language perception, and motor control. Requires no programming experience. Open to nonmajors. Pre: 102, 320, PSY 100, or ICS 111; or consent.

**LING 440 Semantics (3)** Linguistic semantics, including lexical and logical semantics, and an introduction to speech acts. Pre: 320 or consent. **DH**

**LING 441 Meaning (3)** Theories of how literal and figurative language encode meaning and processes of meaning encoding and decoding. Open to nonmajors. Pre: 102, 320, PSY 100, or ICS 111; or consent.

**LING 451 Induction of 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 or consent. **DH**

**LING 470 Children's Speech (3)** Individual strategies, baby talk, language socialization, language variation including multilingualism. Relation of cognitive to language development. Pre: 320. **DS**

**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)** Principles of acoustics and audition as they relate to speech sounds, use of computer-based analysis tools to investigate acoustic properties of speech. A-F only. Pre: 410 or consent.

**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: consent.

**LING 621 Phonology (3)** Phonological theory and problems of analysis. Pre: 421 or consent. Fall only.

**LING 622 Grammar (3)** Grammatical theory and problems of analysis. Pre: 422 or consent.

**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 or consent.

**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 and one of 621 or 622; or consent.

**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: 421 and 422; or consent.

**LING 632 Laboratory Research (3)** Laboratory methods for research in linguistics. Introduction to hardware, software, research designs and basic analysis techniques commonly used in laboratory-based research. Combines lecture, laboratory work and discussion. Repeatable two times. Pre: graduate standing.

**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: 421 and 422; or consent.

**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 with few or no written records. Pre: 421 and 422, or consent.

**LING 646 The Comparative Method (3)** Continuation of 645. Pre: 645.

**LING 650 Advanced Linguistic Analysis (3)** Advanced problems; discussion of theory and techniques in morphology and syntax. Repeatable. Pre: 622 or consent.

**LING 651 Advanced Linguistic Analysis (3)** Advanced problems; discussion of theory and techniques in phonology. Repeatable. Pre: 621 or consent.

**LING 661 Proto-Austronesian (3)** Introduction to Austronesian comparative linguistics; Dempwolff's reconstruction and subsequent modifications; problems of subgrouping. Pre: 645 or consent.

**LING 670 Developmental Linguistics (3)** Survey of the literature in language acquisition; emphasis on relation to linguistic theory. Pre: 421 and 422; or consent.

**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 730 Advanced Laboratory Research (3)** Advanced laboratory methods for research in linguistics. Specialized and/or advanced uses of hardware, software, research designs and analysis techniques. Specific topic varies: check with department. Combines lecture, laboratory work and discussion. Repeatable two times. Pre: 632 or consent.

**LING 750 (Alpha) Seminar (3)** Reporting and discussion of current research in linguistics. Repeatable. (C) language data processing; (E) ethnolinguistics; (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 760 Problems in Comparison and Prehistory (3)** Reconstruction, classification, divergence measures, dialect geography, other historical-comparative studies. Repeatable. Pre: 645 or consent.

**LING 770 Areal Linguistics (3)** Structures of languages of various areas of the world; diffusion. Repeatable. Pre: consent.

**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)**

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## Management (MGT)

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### *College of Business Administration*

**MGT 320 Fundamentals of Entrepreneurship (3)** Covers the role of new ventures and entrepreneurship in the world economy, the formation, funding, marketing, structure and implementation of business ventures.

**MGT 321 Project/Venture Management (3)** Project/venture management application or project/venture management techniques such as planning methods; PERT/CPM forecasting; application of most current practices. Pre: BUS 310 and 315.

**MGT 322 Supply Chain Management (3)** Improving organization productivity with an emphasis on supply chain management principles in terms of scheduling, inventory, quality control techniques, through most current practices. Pre: BUS 310 and 315.

**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. DS

**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 343 Comparative Management Systems: United States and Japan (3)** Similarities and differences in managers, in process of management, and in relevant environmental constraints in Japan and the United States. 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 345 Entrepreneurial Ventures (3)** Integrative course in entrepreneurship designed around the development of an original business concept and the completion of a comprehensive business plan for a new venture. Intended as final course for students completing entrepreneurship minor. Pre: 320 or consent.

**MGT 348 History of American Business (3)** The evolution of business enterprise from colonial times to the present. Emphasis on entrepreneurship, technological change, labor-management relations, government-business relations, and economic thought. Case studies of industrial development. (Cross-listed as HIST 378) DH

**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 450 Family Business (3)** The exploration of business, personal, and interpersonal issues associated with a family owned and managed company. Topics include: family psychology and organizational structure, life cycles in family business, strategic family and business planning, succession planning, family business conflict resolution, estate planning, the role of professional managers, and others. This is not a course about how to become an entrepreneur or how to start or manage a business. It is most appropriate for those students who are part of a family that owns and manages a business. Pre: BUS 315 or graduate status or consent.

**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 organization strategies and how they relate to the industrial trade policies. Pre: BBA core excluding BUS 345, or consent.

**MGT 461 Corporate Entrepreneurship (3)** Exploration of the nature and role of entrepreneurship behavior inside larger, established organizations. An examination of obstacles to entrepreneurial activity and approaches to creating work environments that foster entrepreneurship. Pre: 320 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 manage-

ment 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 701 Cross-Cultural Management (3)** Course provides tools to compare and contrast management practices across nations and to examine the role of culture in shaping those practices. A-F only. Pre: PhD student status in international management or consent.

**MGT 704 PhD Seminar - Corporate Strategy and International Business (3)** Course objectives include: explore research topics in corporate strategy and international business, examine conceptual and empirical literature on management of the multinational corporation, and prepare students for comprehensive examination. A-F only. Pre: PhD student status in international management or consent.

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

## Maori (MAO)

*College of Languages, Linguistics and Literature*

**MAO 101 Beginning Maori (4)** Beginning Maori listening, speaking, reading, and writing skills. Structural points introduced inductively. History and culture. Meets four hours weekly; daily lab work. HSL

**MAO 102 Beginning Maori (4)** Continuation of 101. Pre: 101. HSL

**MAO 201 Intermediate Maori (4)** Continuation of 102. Meets four hours weekly, three of

four hours devoted to drill and practice. Daily lab work. Pre: 102. HSL

**MAO 202 Intermediate Maori (4)** Continuation of 201. Pre: 201. HSL

**MAO 261 Maori Literature and Culture (3)** Survey of literature concerning myths, traditions, poetry and song as well as contemporary literature (in English) relating to the Treaty of Waitangi, Maori prophetic sayings. Students who have previously taken this course as PACS 492 may not take this course. Pre: consent. (Cross-listed as ENG 257S) DL

**MAO 384 Maori Language and the Performing Arts (3)** Analysis of Maori language song texts, historical and genre background of Maori oral literature and performing arts. Pre: 101, 102 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) DS

**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 310 and BUS 312, or consent. DS

**MKT 331 Marketing Communications (3)** In-depth coverage of the major communication tools used in marketing such as advertising, sales promotion, public relations and the internet. Emphasis on integrated marketing communications. Pre: BUS 312 or consent.

**MKT 332 Integrated Communication Campaigns (3)** Management of integrated marketing communications campaigns. Includes: conducting target market and competitor research, developing creative content and media strategies, production of communication materials and completion of major real world project. Pre: 331 and BUS 312.

**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 352 Sales Management (3)** Course delves into the Sales Management process. Through a variety of activities, students gain experience in sales planning, recruiting and training sales people, methods of motivating and compensating, territory management and sales team communications. 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 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 Customer Relationship Management (3)** This course focuses on the evolving field of customer relationship management. Students learn how to manage marketing information and decision-making systems that maximize customer retention and build long-term relationships. A-F only. Pre: 321 and BUS 311; or consent.

**MKT 372 Marketing for New Ventures (3)** Examines role of marketing in the formation and launch of entrepreneurial ventures within and outside of ongoing businesses. Emphasis on new product development and low cost, high impact marketing activities. 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 411B Imagination, Entrepreneurship and Business Problem-Solving (3)** Application of creative process to problems encountered in venture creation/growth. Student problem-solving styles are characterized and implications drawn for generation of breakthrough ideas. Tools for facilitating creative solutions to marketing problems are investigated. Pre: junior standing and BUS 312; or consent.

**MKT 651 Advanced Marketing Management (3)** A case course in the application of advanced marketing methods. Pre: BUS 618 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 618 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 618 or consent.

**MKT 654 Marketing Communications Management (3)** Emphasis on developing integrated advertising, sales promotion, public relations and internet communication strategies that build brand equity. Includes relevant customer behavior and real world applications. Pre: BUS 618 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 618 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 618 or consent.

**MKT 657 Services Marketing (3)** Conceptual understanding of distinctive aspects of services, services management, and services research. Pre: BUS 618 or consent.

**MKT 690 Advanced Seminar in Marketing (3)** Significant topics, problems in marketing. May be repeated with change in topic. Pre: BUS 618 or consent.

**MKT 701 International Marketing Theory (3)** Focuses on the building blocks of theory, their use, and evolution within a marketing context. Explores marketing theories, theory construction, and the creation of marketing knowledge. A-F only. Pre: PhD student status in international management or consent.

**MKT 702 International Cross-Cultural Consumer Behavior (3)** Focuses on consumer behavior theory with a strong emphasis on cross-cultural research issues and methodology. Provides in-depth review of important published work in traditional and cross-cultural consumer behavior fields. A-F only. Pre: PhD student status in international management or consent.

**MKT 703 International Marketing Strategy Doctoral Seminar (3)** Focuses on theories of strategic marketing and planning. Explores the theoretical principles of marketing concepts, tools, and processes that can be used to help an organization develop a sustainable competitive advantage. A-F only. Pre: PhD student status in international management or consent.

**MKT 704 Advanced Topics in International Marketing Seminar (3)** Selected topics in any aspect of international marketing to increase exposure to the range of issues researchers commonly confront. A-F only. Pre: PhD student status in international management or consent.

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

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## Mathematics (MATH)

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*College of Natural Sciences*

**MATH 100 Survey of Mathematics (3)** Selected topics designed to acquaint nonspecial-

ists with examples of mathematical reasoning. May not be taken for credit after 215 or higher. FS

**MATH 111 Math for Elementary Teachers I (3)** Understanding, communicating, and representing mathematical ideas, problem solving, and reasoning. Operations on sets, natural numbers, integers, fractions, reals, and functions. The properties of these operations; patterns and algebra. Prospective elementary education majors only.

**MATH 112 Math for Elementary Teachers II (3)** Representations of and operations on the natural numbers, integers, rationals and reals; properties of those operations. Connections to other parts of mathematics and applications. Pre: 111 or consent. FS

**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. FS

**MATH 190 Fortran Programming (1)** An introduction to numerical algorithms and programming in Fortran (and possibly Basic). Pre: one semester of calculus (or concurrent), or consent.

**MATH 203 Calculus for Business and Social Sciences (3)** Basic concepts; differentiation and integration; applications to management, finance, economics, and the social sciences. Pre: two years high school algebra, one year plane geometry, and precalculus assessment. FS

**MATH 207 History of Mathematics (3)** The historical development of mathematical thought. Pre: one year of calculus. Recommended: 311 or 321.

**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. FS

**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 241 Calculus I (4)** Basic concepts; differentiation with applications; integration. Pre: a grade of C or better in 140 or 215 or precalculus assessment. FS

**MATH 242 Calculus II (4)** Integration techniques and applications, series and approximations, differential equations. Pre: a grade of C or better in 241 or 251 or a grade of B or better in 215; or consent.

**MATH 243 Calculus III (3)** Vector algebra, vector-valued functions, differentiation in several variables, and optimization. Pre: a grade of C or better in 242 or 252; or consent.

**MATH 244 Calculus IV (3)** Multiple integrals; line integrals and Green's Theorem; surface integrals, Stokes's and Gauss's Theorems. Pre: 243 or consent.

**MATH 251A Accelerated Calculus I (4)** Basic concepts; differentiation with applications; integration. Compared to 241, topics are discussed in greater depth. Pre: a grade of A in

140 or precalculus assessment and consent.

**MATH 252A Accelerated Calculus II (4)** Integration techniques and applications, series and approximations, differential equations, introduction to vectors. Pre: a grade of B or better in 241 and consent.

**MATH 253A Accelerated Calculus III (4)** Vector calculus; maxima and minima in several variables; multiple integrals; line integrals, surface integrals and their applications. Pre: 252A.

**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: 190.

**MATH 302 Introduction to Differential Equations I (3)** First order ordinary differential equations, constant coefficient linear equations, oscillations, Laplace transform, convolution, Green's function. Pre: 216 or 243 (or concurrent) or 253A (or concurrent), or consent.

**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 307 Linear Algebra and Differential Equations (3)** Introduction to linear algebra, application of eigenvalue techniques to the solution of differential equations. Students may receive credit for only one of 307 and 311. Pre: 243 or 253 (or concurrent) or consent.

**MATH 311 Introduction to Linear Algebra (3)** Algebra of matrices, linear equations, real vector spaces and transformations. Students may receive credit for only one of 307 and 311. Pre: 243 or 253A (or concurrent) 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: 243 or 253A (or concurrent) or consent.

**MATH 331 Introduction to Real Analysis (3)** A rigorous axiomatic development of one variable calculus. Completeness, topology of the plane, limits, continuity, differentiation, integration. Pre: 242 or 252, and 321; or consent.

**MATH 351 Foundation of Euclidean Geometry (3)** Axiomatic Euclidean geometry and introduction to the axiomatic method. Pre: 243 or 253A, 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: 216, 242 or 252A, or consent.

**MATH 373 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: 243 or 253A, or consent. Recommended: 244 and 302.
- 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 405 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: 302 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: 311 and one semester programming; or consent.
- 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: 307 or 311, or consent.
- MATH 416 Operations Research: Probabilistic Models (3)** Queuing theory, inventory theory, Markov chains, simulation. Pre: 307 or 311, and 371, 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 (3)** Topology of  $\mathbb{R}^n$ , 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: 311 and 331; or consent.
- MATH 432 Advanced Calculus (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: 244 or 253, and 307 or 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: 244 or 253A, and 311; or consent.
- MATH 444 Complex Variable (3)** Analytic functions, complex integration, introduction to conformal mapping. Pre: 244 or 253A; recommended 307, 311, 321 or 331; or consent.
- MATH 449 (Alpha) Topics in Undergraduate Mathematics (3)** Advanced topics from various areas: algebra, number theory, analysis, and geometry. Repeatable. Pre: 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 455 Mathematical Logic (3)** A system of first order logic. Formal notions of well-formed formula, proof, and derivability. Semantic notions of model, truth, and validity. Completeness theorem. Pre: 454 or consent.
- MATH 471 Probability (3)** Probability spaces, random variables, distributions, expectations, moment-generating and characteristic functions, limit theorems. Continuous probability emphasized. Pre: 244 or 253A (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: 471 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: 311 or consent.
- MATH 480 Senior Seminar (V)** A seminar for senior mathematics majors, including an introduction to methods of research. CR/NC only. Pre: one 400-level mathematics course or consent.
- MATH 499 Directed Reading (V)** Limited to advanced students who must arrange with an instructor before enrolling. Repeatable one time 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 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, 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 607 Numerical Analysis (3)** Perron-Frobenius theory, nonnegative matrices, matrix numerical analysis, iterative methods, discrete approximation to partial differential equations. Pre: 402, 407, 408, or consent.
- MATH 611 Modern Algebra (3)** Modules, Sylow theorems, Jordan-Holder 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, solvable groups, nilpotent 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, Poincaré 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-Stieltjes 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 631. This is the second course of a year sequence and should be taken in the same academic year as 631. Pre: 631.

**MATH 633 Functional Analysis (3)** Linear topological spaces, normed spaces, Hilbert spaces, function spaces, function algebras, operator theory. Pre: 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., Prime, 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: 631 or consent.

**MATH 672 Stochastic Processes (3)** Stationary, Gaussian, and Markov processes. Pre: 671 or consent.

**MATH 681 Graph Theory (3)** Connected graphs and digraphs. Graph embeddings. Connectivity and networks. Factors and factorizations. Coverings. Coloring. Applications. Pre: 311 or consent.

**MATH 699 Directed Reading and Research (V)** Maximum of 3 credit hours. Repeatable three times. Pre: graduate standing and consent.

**MATH 700 Thesis Research (V)** Research for master's thesis. Pre: 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 one time. CR/NC only. Pre: graduate standing in mathematics and consent.

**MATH 800 Dissertation Research (V)** Research for doctoral dissertation.

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## MDHX

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See *Medical History*

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## Mechanical Engineering (ME)

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*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 I (2)** (1 Lec, 1 2-hr Lab) Introductory experience in analysis, synthesis, design, and computer-aided modeling. Teamwork and project required. Pre: high school physics or consent.

**ME 213 Introduction to Engineering Design II (2)** (1 Lec, 1 2-hr Lab) Introductory experience in communication, presentation, professional ethics, social responsibility, engineering economics, quality control, and computer-aided drafting. Teamwork and project required. Pre: 113.

**ME 311 Thermodynamics (3)** Basic laws, closed and open systems. Work, heat, concept of entropy. Properties of pure simple substances. Ideal gases. Introduction to power and refrigeration cycles. Pre: PHYS 170. **DP**

**ME 312 Applied Thermodynamics (3)** Gas mixtures, generalized thermodynamic relationships, combustion and thermochemistry, chemical equilibrium, power and refrigeration cycles. Pre: grade of C- or better in 311. **DP**

**ME 322 Mechanics of Fluids (3)** Incompressible and compressible ideal fluids, effects of viscosity. Similitude, boundary layer flow, elementary gas dynamics. Pre: grade of C- or better in 311. **DP**

**ME 331 Materials Science and Engineering (3)** Electronic, atomic, and crystalline structure of materials and their effect on the mechanical, electrical, optical, and magnetic properties of engineering metals, ceramics, polymers, and composites. Pre: CHEM 162, MATH 242 and PHYS 170. **DP**

**ME 341 Manufacturing Processes (3)** Manufacturing components. Energy requirements for various manufacturing methods. Selection and design of manufacturing methods to obtain components with desired size/shape/properties. Pre: 331 or consent. **DP**

**ME 341L Manufacturing Processes Lab (1)** (1 2-hr Lab) Manufacturing laboratory: tension/compression tests, cold rolling, welding, casting, statistical process control, programming and milling using a CNC machine. Pre: 341 (or concurrent) or consent. **DY**

**ME 351 Linear Feedback-Control Systems (3)** Analysis/design of feedback systems. Compensator design via root locus and Bode analysis. Routh/Nyquist stability. State space representation and introduction to MIMO formulation. Controllability/observability. Application to physical dynamic systems such as industrial robots. Pre: 375 or EE 315 or consent. Co-requisite: EE 351L. (Cross-listed as EE 351) **DP**

**ME 360 Computer Methods in Engineering (3)** Numerical solutions for algebraic and transcendental equations, simultaneous linear algebraic equations, integration and differentia-

tion; integration of ordinary differential equations. Engineering applications. Pre: MATH 190, MATH 244 and MATH 302 (or MATH 307).

**ME 371 Mechanics of Solids (3)** Stress, strain and constitutive relations for elastic solids. Design of shafts, beams, columns and cylinders. Failure theories, statically indeterminate systems. Pre: CEE 270, MATH 244 and MATH 302 (or MATH 307). **DP**

**ME 372 Component Design (3)** Design, analysis, and selection of machine components: shafts, screws, fasteners, welds, rolling contact bearings, journal bearings, gears, clutches, brakes, belts, and roller chains. Pre: mechanical drawing, 113, and 371; or consent. **DP**

**ME 373 Experimental Stress Analysis (2)** (1-3 hr Lab) Techniques of experimental stress analysis: strain and deflection measurement of beams and shafts, strain to stress conversion, principal and maximum shearing stresses, failure in biaxial stress states, stress concentrations, residual stresses, buckling, creep, electrical resistance strain gages, brittle coatings, photoelastic methods, transducers. A-F only. Pre: 371 and departmental approval. Spring only.

**ME 374 Kinematics/Dynamics Machinery (3)** Velocity and acceleration analysis of planar mechanisms; kinematic synthesis of linkages, cams, and gears; static and dynamic force analysis of mechanisms; balancing of machinery. Pre: MATH 244 and MATH 302 (or MATH 307). **DP**

**ME 375 Dynamics of Machines and Systems (3)** Lumped-parameter modeling of dynamic physical systems. Methods of analysis, including transform techniques. Time response and frequency response. Modal analysis. Pre: MATH 302 or MATH 307. **DP**

**ME 401 Thermofluids Laboratory (2)** Design and analysis of hands-on experiments in fluid mechanics, thermodynamics and heat transfer. A-F only. Pre: 422 (or concurrent) or consent. Fall only.

**ME 402 Dynamics Systems Laboratory (2)** (1 Lec, 1 2-hr Lab) Analysis, design, fabrication, testing and characterization of engineering instrumentation. Computer-based data acquisition methods. Techniques and procedures associated with carrying out dynamic measurements within the constraints of cost, time and accuracy. A-F only. Pre: 375 (or concurrent).

**ME 403 Advanced Mathematics for Engineers (3)** Applications of ordinary differential equations, Laplace transform, vector field theory, matrices, line integrals. Pre: MATH 244 and MATH 302 (or MATH 307).

**ME 417 Applied Thermal Engineering (3)** Principles, design and analysis of practical thermal systems. Engineering applications. Valve, compressor, condenser and evaporator technologies. System integration and control. Thermal loads and thermal comfort. Pre: 312 and 422. **DP**

**ME 418 Power and Propulsion (3)** Principles, performance, and design of gas turbine power plants and propulsion systems. Pre: 312 and 422 (or concurrent). **DP**

**ME 422 Heat Transfer (3)** Steady and transient conduction. Fundamentals of radiation and convection. Heat exchangers. Pre: 322. **DP**

- ME 423 Mass Transfer (3)** Elementary Mass Diffusion; Diffusion in a Stationary Medium; Diffusion in a Moving Medium; Low and High Mass Transfer Theories; Simultaneous Heat and Mass Transfer; Condensation, Evaporation, and Boiling; Transpiration Cooling; Species Boundary Layers; Engineering and Design of Heat and Mass Exchangers; Current Refrigerants and Environmental Regulations. A-F only. Pre: 422 or consent. **DP**
- ME 424 Introduction to Gas Dynamics (3)** One-dimensional compressible flow involving change of area, friction, heat transfer. Normal and oblique shocks. Prandtl-Meyer flow. Application to nozzles, diffusers, airfoils. Pre: 312 and 322. **DP**
- ME 433 Failures in Materials (3)** Analysis of component failures due to imperfections, fatigue, brittle fracture, wear, corrosion, bending, impact, and overload. Fracture mechanics. Case studies. Pre: 331 or consent. **DP**
- ME 434 Materials Selection for Design (3)** Methodology for the selection of materials for mechanical applications to prevent mechanical failure and environmental degradation. Design considerations associated with the use of metals, ceramics, polymers, and composites. Pre: 341, 341L, and 371. **DP**
- ME 435 Experimental Methods in Materials Research (3)** (1 Lec, 2 2-hr Lab) Common experimental techniques in materials testing and research: x-ray diffraction, optical and electron microscopy, thermal and mechanical properties, electrochemical methods—theory and hands-on experience. Pre: 341 and consent.
- ME 436 Corrosion Engineering (3)** Basics of corrosion processes and emphasis on corrosion control. Thermodynamics and kinetics of corrosion, metal alloys and their behavior, corrosion control techniques (cathodic protection, anodic protection, coatings, and inhibitors). Pre: 341 and 341L, or consent. **DP**
- ME 446 Advanced Materials Manufacturing (3)** (2 Lec, 1 2-hr Lab) Introduction to anisotropic materials, advanced manufacturing techniques for composite and intelligent materials, joining of composites, thin film processing and stereolithography, computer aided manufacturing and rapid prototyping, manufacturing process optimization, open-ended manufacturing projects. Pre: 341, 341L, and senior standing; or consent. **DP**
- ME 447 Introduction to Nanotechnology (3)** (3 Lec) Tools and techniques of micro- and nano-technology in design, modeling, simulations, analysis, fabrication, testing and characterization; nano-materials, nano-structures, nano-composites, nano-coating, nano-optics, nano-electronics and nano-biotechnology. A-F only. Pre: senior standing or consent. **DP**
- ME 452 Robotics (3)** Principles and design methods for autonomous systems. Pre: senior standing. **DP**
- ME 453 Energy Conversion Systems (3)** Energy conversion and its impact on the environment. Conventional, hydroelectric, nuclear fission and fusion, solar, wind, ocean, geothermal, and biomass power; energy storage, transmission and conservation. Pre: 312, 322, and 422 (or concurrent); or consent. **DP**
- ME 455 Nuclear Power Engineering (3)** Nuclear reactor principles. Reactor heat transfer, heat generation and removal. Design and analysis of reactor power systems and plants. Pre: 312 and 422. **DP**
- ME 473 Mechanical Vibrations (3)** Response of machines and systems to transient and periodic excitation. Vibration isolation and transmissibility. Modal analysis of multi-degree-of-freedom systems. Applications to design. Pre: 371, 375, or consent. **DP**
- ME 474 Fundamentals of Acoustics (3)** Plane and spherical acoustic waves. Transmission, reflection, radiation, and absorption. Near and far fields, radiation patterns. Applications to noise control. Instruments. Pre: 375, EE 211, or consent. **DP**
- ME 480 Thermofluid Design (3)** Analytical, experimental and computational methods for the analysis and design of thermofluid systems; conceptual design; wind tunnel aided design; computational fluid dynamics aided design; drawings, final report, including manufacturing specifications and presentation are required. A-F only. Pre: 442 (or concurrent).
- ME 481 Design Project I (3)** (1 1-hr Lec, 2 2-hr Lab) Engineering ethics, engineering design methodology, design process, project planning, decision making, materials selection, economic analysis, quality control, finite element analysis, initiation of an open-ended design project. A-F only. Pre: 372 or consent.
- ME 482 Design Project II (3)** (1 Lec, 2 2-hr Lab) Continuation of design project initiated in ME 481. Extension of conceptual design to final design and a prototype. Analysis, materials and part selection, synthesis of working systems. Computer-aided design and finite element modeling. Manufacturing specifications, shop drawings, and a final report are required. A-F only. Pre: 375 and 481, or consent.
- ME 491 Special Topics in Mechanical Engineering (3)** Specialized topics in thermosciences, mechanics, materials, systems, or design. Pre: consent.
- ME 492 Special Topics in Mechanical Engineering (3)** Specialized topics in thermosciences, mechanics, materials, systems, or design. Pre: consent.
- ME 499 Project (V)** Investigation of advanced problems in mechanical engineering design or development. Student must find faculty sponsor before registering. Pre: senior standing.
- ME 500 Master's Plan B/C Studies (1)**
- ME 611 Classical Thermodynamics (3)** Critical study of foundations of thermodynamics. Definitions, laws and corollaries. Chemical, electrical, magnetic systems. Determination of equilibrium states. Pre: 312.
- ME 612 Advanced Thermodynamics (3)** Advanced classical thermodynamics and fundamentals of statistical thermodynamics. Availability; exergy; entropy generation minimization; thermoeconomics; statistics; quantum mechanics; ideal and dense gases; kinetic theory. Pre: 312, 322, and 422; or consent.
- ME 617 Thermal Environmental Engineering (3)** Physiological response to thermal environment, designs of passive and active cooling systems, student project. Pre: 417 or consent.
- ME 621 Conduction Heat Transfer (3)** Steady and unsteady heat conduction with and without heat sources in solids. Analytical, numerical, graphical, analog methods for solving heat conduction problems. Pre: 422.
- 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 623 Radiation Heat Transfer (3)** Radiant interchange among surfaces. Gaseous radiation. Combined conduction, convection, and radiation heat transfer. Pre: 422 and senior standing.
- ME 624 Multi-Phase Flow (3)** Lagrangian modeling of particle motion in viscous flows; drag, lift, virtual mass, and history forces; particle motion in non-uniform flows; computational methods in multi-phase flows. A-F only. Pre: MATH 302 or MATH 307.
- ME 625 Numerical Methods in Fluid Mechanics and Heat Transfer (3)** Integration of ordinary differential equations. Finite difference solutions of partial differential equations with applications to conduction and convection. Introduction to finite element methods. Pre: 422 and MATH 190.
- 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 engineering. Pre: 422 or consent.
- ME 628 Chemical Reactor Analysis and Design (3)** Chemical kinetics with heat and mass transfer. Balance equations applied to selected ideal reactors. Departures from ideality. Pre: 422 and 627.
- 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 631 Advanced Materials Science (3)** Properties of materials interpreted from the atomistic viewpoint. Crystal structure and defects. Thermodynamics of solids; phase transformations; experimental techniques. Pre: 331.
- ME 635 Corrosion Theory (3)** Application of electrochemical theory and materials science to corrosion and oxidation reactions. Effect of environment, especially marine. Cathodic protection, coatings, inhibitors, treatment of water systems. Pre: 331.
- ME 636 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 671 Continuum Mechanics (3)** Cartesian tensors in mechanics, coordinate transformations, analysis of stress and strain, principal values, invariants, equilibrium and compatibility equations, constitutive relations, field equations. Problems in elasticity. Pre: 371 or CEE 370, or consent. (Cross-listed as CEE 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 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 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 700 Thesis Research (V)** Thesis for degree of MS in mechanical engineering. Pre: admission to candidacy and consent of thesis adviser.

**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.

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## 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)**

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## Medical Technology (MEDT)

*School of Medicine*

**MEDT 151 Introduction to Medical Technology I (2)** Designed to acquaint student with relationship of medical technology to the medical field.

**MEDT 251 Introduction to Medical Technology II (2)** (1 Lec, 1 3-hr Lab) Designed to acquaint student with basic principles of medical technology. Pre: 151, CHEM 161 and CHEM 161L, and BIOL 171 and BIOL 171L (or concurrent). **DB**

**MEDT 301 The Clinical Laboratory I (3)** (2 Lec, 1 3-hr Lab) Theory and practical application of clinical laboratory methods for 366. MT-patient and MT-health team relationships. Pre: PHYL 301 (or concurrent) and junior standing in program.

**MEDT 302 The Clinical Laboratory II (3)** (2 Lec, 1 3-hr Lab) Continuation of 301. Pre: 301 and PHYL 302 (or concurrent).

**MEDT 331 Clinical Lab Management (1)** Student will become familiar with fundamental administration of a clinical laboratory to include technical, personnel, and financial management areas. CR/NC only. Pre: consent.

**MEDT 366 Clerkship (2)** Clerkship in an affiliated lab. CR/NC only. Pre: 301 and 302.

**MEDT 431 Medical Parasitology (3)** (2 Lec, 1 2-hr Lab) Diagnosis of parasitic diseases by laboratory methods; outstanding features of life cycles, classification and medical significance of parasites. Pre: MICR 351 or consent. (Cross-listed as TRMD 431)

**MEDT 451 Basic Hematology (3)** (2 Lec, 1 3-hr Lab) Fundamental study of blood in normal and pathological states: formation, development, and classification of blood cells. Pre: 366 or consent.

**MEDT 457 Clinical Lab Methods and Analyses I (3)** Principles and methods of assessing disease states using laboratory tests. Emphasis on clinical biochemistry and instrumentation. Pre: 471 or consent.

**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 458 Clinical Lab Methods and Analyses II (3)** Continuation of 457.

**MEDT 458L Clinical Lab Methods and Analyses Lab 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 one time. Pre: BIOC 441 or BIOL 405 or CMB 405. Spring only. (Cross-listed as BIOC 471)

**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 med technology. CR/NC only. Pre: consent.

**MEDT 499 Directed Reading and Research (V)**

**MEDT 591 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 690 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.

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## Medicine (MED)

*School of Medicine*

**MED 531 Internal Medicine Clerkship (16)** Required course for third-year medical students, 11-week duration. Ambulatory care and hospital-based experience in a spectrum of medical problems. Application of skills and techniques to solve clinical problems. CR/NC only. Pre: BIOM 555.

**MED 532 Internal Medicine Longitudinal Clerkship (5)** Six-month long clerkship in ambulatory setting, and eight-week hospital-based experience. Application of history-taking and physical examination skills for evaluation and care of clinical problems. Emphasis on primary and preventive care, clinical decision-making, and management of patients with complex problems. Repeatable two times. CR/NC only. Pre: third-year standing and concurrent registration in 532 courses.

**MED 541 Advanced Medicine Clerkship (6)** Required course of 4 weeks duration for fourth-year medical students. Advanced experiences in ambulatory and hospital-based medical care. Proficiency in this course may be established by examination. CR/NC only. Pre: fourth-year standing and completion of 531 or consent.

**MED 545 (Alpha) Unit VII Electives in Medicine (V)** Elective course for fourth-year medical students involving more advanced study of selected topics within internal medicine than was possible in 531. (R) research in medicine. Repeatable one time. CR/NC only. Pre: 531 or 532.

**MED 546 (Alpha) Unit VII Electives in Medicine (V)** Fourth-year electives in which students study selected topics within field of medicine. (B) extramural electives in medicine (miscellaneous); (C) internal medicine seminar; (D) infectious disease; (E) internal medicine sub-internship; (F) research in bioethics; (G) neurology critical care; (H) medical informatics. Repeatable one time for (B)-(E); not repeatable for (F); repeatable two times for (H); repeatable three times for (G). CR/NC only. Pre: 531 or 532 for (B) and (C); 541 for (E) and (H) or departmental approval; and strong writing skills for (F). Background in humanities/literature

recommended for (F). Co-requisite: 531, 532, 541 for (G) and (H); 545 for (C).

**MED 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 Hawai'i. **DP**

### **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). **DY**

### **MET 200 Descriptive Meteorology (3)**

Atmospheric variables and gas laws, radiation processes, thermodynamics, clouds and precipitation, atmospheric circulations, mid-latitude and tropical systems, forecasting, weather applications, climate. Pre: PHYS 152L or PHYS 170 (or concurrent). **DP**

### **MET 210 Programming for Meteorologists (2)**

(1 lec, 1 3-hr lab) Scientific programming in Fortran 90, graphics software and meteorological applications. A-F or Audit. Pre: 200 (or concurrent) and MATH 241; or departmental approval. Fall only.

**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 and PHYS 272, or consent. **DP**

**MET 303 Introduction to Atmospheric Dynamics (3)** Scalar and vector development of 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 244, or consent. **DP**

### **MET 305 Meteorological Instruments and Observations (3)**

(2 Lec, 1 3-hr Lab) First- and second-order measurement systems. Response of wind, temperature, and recording instruments. Discussion of advance system including radar. Planning of field programs. Pre: PHYS 152 and PHYS 152L, or PHYS 272 and PHYS 272L; or consent. **DP**

### **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: one environmentally oriented science course. (Cross-listed as OEST 310 and OCN 310) **DP**

### **MET 310L Global Environmental Change Laboratory (2)**

(3-hr Lab) Laboratory course to supplement MET 310. Quantitative aspects of global environmental change will be addressed through problem solving and computer modeling. A-F only. Pre: MATH 242 or MATH 242A, PHYS 170, PHYS 170L, CHEM 161, and CHEM 161L; or consent. Co-requisite: 310 or consent. Fall only. (Cross-listed as OEST 310L and OCN 310L) **DY**

### **MET 402 Applied Atmospheric Dynamics (3)**

Advanced concepts in dynamics: vorticity, cyclogenesis, jet streams, fronts, mesoscale circulations. Pre: 303 or consent. **DP**

### **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. **DP**

### **MET 406 Tropical Meteorology (3)**

History; tropical clouds and hydrometeors; typhoons; monsoons; local and diurnal effects. Pre: 303 or consent. **DP**

### **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 470 Air Pollution (3)**

(2 lec, 1 3-hr lab) A survey of the physical and chemical aspects of air pollution and climate at global and local scales; responses to threats to our atmospheric environment. Lecture, lab and field trips. GES majors. A-F only. Pre: 310, CHEM 162, MET 200, PHYS 272 or consent. Spring only. (Cross-listed as OCN 470) **DP**

### **MET 495 Undergraduate Thesis (3)**

Capstone course for senior Meteorology majors. Undergraduate thesis project includes literature review, experiment or research design, data collection and analysis, technical writing of a final thesis paper and oral presentation of the paper. A-F only. Pre: 302, 303, 402 (or concurrent), 412 or 416 (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 MATH 402 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. (Alt. years)

### **MET 606 Cumulus Dynamics (3)**

Dynamics of convective systems: tornadoes, 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 Niño and Southern Oscillation; intraseasonal oscillation; trade winds; tropical weather systems; energy balance; typhoons. Pre: 303 or consent.

**MET 614 Tropical Cyclones (3)** Lecture class covering fundamentals of tropical cyclone

structure, motion, and impacts on society. Observations from satellites, aircraft, ships and buoys, and numerical simulations focusing on storm structure and track. Some forecasting exercises. Repeatable one time. Pre: 600 and 610; or consent. (Alt. years)

### **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 371. (Alt. years)

### **MET 632 Advanced Statistical Methods in the Geosciences (3)**

Methods for numerous multivariate analyses will include singular spectrum, extended empirical orthogonal function, singular-value decomposition, canonical correlation, discriminant and cluster analysis. Other advanced topics include wavelet analysis, statistical downscaling and Bayesian analysis. A-F only and audit. Pre: 631 or consent. (Every 3rd year)

### **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) (Alt. years)

### **MET 666 Large-Scale Ocean-Atmosphere Interactions (3)**

This lecture/seminar course introduces physical oceanography and meteorology students to the state-of-the-art theories and observations of large-scale ocean-atmosphere interaction, as well as conveying the fundamental understanding that has been developed during the past 30 years. Emphasis will be on phenomena such as El Niño/Southern Oscillation, the North Atlantic Oscillation, the Pacific Decadal Oscillation, and global climate change. Repeatable one time. Pre: 600 or OCN 620; or consent. (Cross-listed as OCN 666) (Alt. years)

**MET 699 Directed Research (V)** Pre: consent.

**MET 700 Thesis Research (V)**

**MET 702 Numerical Weather Prediction (3)** (2 Lec, 1 3-hr Lab) Fundamental methods and

techniques in numerical weather prediction: time differencing, spatial finite differencing, spectral methods, numerical stability, explicit and implicit methods. Modern operational and research forecast models. Hands-on laboratory includes simple to complex dynamic models, with a term project. Repeatable one time. Pre: 600 or OCN 620; MATH 407 or 408; or consent. (Alt. years)

**MET 704 Climate and Climate Variability (3)** Physical basis of climate, numerical climate models, paleoclimatic indicators, modern instrumental climate records, assessment of human impact on climate, predictions of future climate. Repeatable one time. Pre: 600 or OCN 620 or consent. (Alt. years)

**MET 706 Tropical Climate Dynamics and Modelling (3)** Overview of current progress in tropical climate dynamics with a particular focus on large-scale atmosphere-ocean interactions; introduction of basic numerical techniques for students to construct and run immediate tropical atmosphere and ocean models. Pre: 600.

**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 a 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. **DB**

**MICR 140 Microbiology Laboratory (2)** (2 2-hr Lab) Primarily for students in nursing and dental hygiene. Pre: 130 (or concurrent). **DY**

**MICR 301 Microbiology Seminar (1)** Seminars by the department faculty on current topics. Repeatable one time. Pre: 130 or 351 (or concurrent); or consent.

**MICR 314 Research Ethics (1)** An introduction to the ethical issues faced by individuals and institutions involved in scientific research. Based on case studies, students will discuss and write about ethical issues in research. Issues include humans and animals in research, mentoring, authorship, ownership of data, genetic technologies and record keeping. This course is designed for students with majors in the natural sciences. A-F only. Pre: BIOL 172 (or concurrent), or MATH 321 (or concurrent), or PHYS 170 (or concurrent), or CHEM 272 (or concurrent); or consent. **DS**

**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: BIOL 275/275L. **DB**

**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. **DY**

**MICR 361 Introductory Bioinformatics (4)** (3 Lec, 1 3-hr Lab) Introductory bioinformatics will provide a basic foundation of biological information (DNA, protein, genome and proteome) by using information technology (IT). A-F only. Pre: BIOL 275 and BIOL 275L or consent. Fall only.

**MICR 401 Marine Microbiology (3)** Evolution, ecology, biochemistry, genetics and physiology of marine bacteria by examining defined systems and organisms. Pre: BIOL 265/265L and 275/275L and 301/301L, and OCN 201; or 351/351L or consent. **DB**

**MICR 401L Marine Microbiology Laboratory (1)** (1 3-hr Lab) Laboratory to accompany 401. Pre: BIOL 265/265L and BIOL 275/275L and BIOL 301/301L and OCN 201; or 351/351L; 401 or concurrent; or consent. **DY**

**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 at the prokaryote level. Pre: 351 and BIOC 441, or consent. **DB**

**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. **DY**

**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. Recommended: BIOL 275/275L. **DB**

**MICR 461L Immunology Lab (2)** (2 3-hr Lab) Basic exercises and experiments in immunology, immunochemistry, immunobiology to illustrate principles of 461. Co-requisite: 461 or consent. **DY**

**MICR 463 Microbiology of Pathogens (3)** Host-parasite relationships in microbial diseases of humans and animals with emphasis on bacterial pathogens. Pre: 351, 461, and 461L; or consent. Co-requisite: 463L or consent. **DB**

**MICR 463L Microbiology of Pathogens Lab (2)** (2 3-hr Lab) Characterization of bacterial pathogens. Isolation, identification, and diagnosis. Co-requisite: 463 or consent. **DY**

**MICR 470 Microbial Pathogenesis (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.

**MICR 475 Bacterial Genetics (3)** Genetic analysis and molecular basis of transmission replication, mutation, and expression of heritable characteristics in prokaryotes. Pre: 351 or BIOL 275, or consent. **DB**

**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). **DY**

**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. **DB**

**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: 485 (or concurrent) or consent. **DY**

**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. **DB**

**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: 490. **DY**

**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 630 Microbial Genome (3)** Advanced studies of Microbial genome: relation to functional genomics, structural genomics, and proteomics. A-F only. Pre: 351 and one 400-level MICR course, or consent. (Alt. years)

**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 macro-

molecular structure with cell functions. Pre: BIOL 406 and either BIOC 441 or MBBE 402; or consent.

**MICR 646 Plant-Bacterial Interactions (3)** Diagnosis, molecular biology, genetics, and infection mechanisms of bacterial plant pathogens and symbionts. Pre: one of 351, 475, or BIOC 481; or consent. (Cross-listed as PEPS 646)

**MICR 652 Advanced Marine Microbiology (3)** Advanced studies of marine microorganisms in diverse habitats with consideration of applications of marine microbes, interactions with higher organisms, phylogeny and diversity, and past and current methods. A-F only. Pre: 351 and 401 or consent. (Alt. years)

**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, BIOC 601, BIOC 602, and consent. (Alt. years: fall only)

**MICR 671 Bacterial Genetics (3)** Directed study and discussion of research literature on bacterial and bacterial virus mutation, genetic recombination, evolution and control mechanisms. Pre: 475, BIOC 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 synecology 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)**

**MICR 795 Special Topics in Microbiology (V)** Selected topics in any aspect of microbiology. Repeatable.

**MICR 800 Dissertation Research (V)**

## Military Science and Leadership (MSL)

### ROTC Programs

*A weekly one-hour leadership laboratory is required for courses numbered 200 and above. This laboratory is optional for the 100-level courses. The laboratory includes practical application of leadership skills, drills and ceremonies, basic soldiering skills, and Army Physical Fitness Training (APFT).*

### MSL 100 Introduction to Physical Fitness

**(1)** Hands-on participatory course following the Army's physical fitness program. Classes conducted three days per week with Army ROTC cadets. Focus is on aerobic conditioning, muscular strength and endurance. Repeatable 3 times. A-F only. Co-requisite: 105 or 106 or 205 or 206.

### MSL 101 Introduction to Military Science I

**(2)** Provides an initial glimpse of the military and the role that it plays in society. Develops the student's comprehension of the American defense system as it evolved as the result of changes in the American society. Typical subjects include ethics, leadership, effective goal setting, managing time and effort, and the tradition of a citizens' army.

### MSL 101L Introduction to Military Science I Lab

**(1)** Practical application in adventure training, one-rope bridges, rifle marksmanship, land navigation, drill and ceremonies, physical training. Pre: 105 (or concurrent).

### MSL 102 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.

### MSL 102L Introduction to Military Science II Lab

**(1)** Practical application in adventure training, one-rope bridges, rifle marksmanship, land navigation, drill and ceremonies, physical training. Pre: 106 (or concurrent).

### MSL 201 Intermediate Military Science I

**(3)** Basic concepts of military leadership. Familiarization with the 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 1.5 hours per week, consisting of practical application of leadership skills, drill and ceremonies, land navigation, first aid, and army physical fitness training.

### MSL 202 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.

**MSL 203 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.

### MSL 301 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.

### MSL 302 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.

### MSL 303 ROTC Advanced Camp

**(6)** Six-week summer field training exercise conducted at Fort Lewis, Washington. Arduous and intensified leadership training is conducted throughout the six-week period. Required for U.S. Army commissioning. Pre: 305, 306, and consent.

### MSL 391 History of Military Warfare

**(3)** Lecture/discussion on the art and science of warfare throughout history. Restricted to students enrolled in the Army ROTC program. A-F only. Pre: consent.

### MSL 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.

### MSL 401 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.

### MSL 402 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.

## Molecular Biosciences and Bioengineering (MBBE)

*College of Tropical Agriculture and Human Resources*

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

**MBBE 342 Agribusiness Decision-Making (3)** Introduction to quantitative decision making methods for effective agribusiness management in resource allocation, scheduling, logistics, risk analysis, inventory and forecasting. Emphasis on problem identification, model formulation and solution, and interpretation and presentation of results. A-F only. Pre: ECON 130 and NREM 220; or consent. (Cross-listed as TPSS 342 and ECON 429) **DS**

**MBBE 375 Multidisciplinary Biochemistry (4)** (3 Lec, 1 3-hr Lab) Introduction to basic concepts of cellular biochemistry and metabolic pathways as applied to nutritional, medicinal and environmental biochemistry. A-F only. Pre: BIOC 241 or consent. Spring only.

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

**MBBE 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 275, BIOL 275L, CHEM 272 and CHEM 273; or consent. (Cross-listed as BIOL 402) **DB**

**MBBE 402L Principles of Biochemistry Lab (2)** (1 Lec, 1 3-hr Lab) Principle techniques of biochemical laboratory. A-F only. Pre: 402 (or concurrent), BIOL 402 (or concurrent). **DY**

**MBBE 403 Molecular Biosensors (3)** (Lec-Lab) Molecular methods for detection of pathogenic bacteria and potentially hazardous chemicals in air, water, soil and plant materials. Impacts of invasive microbial species on human health and welfare. Repeatable one time. A-F only. Pre: MICR 351 or consent. Recommended: PEPS 350. Fall only. (Cross-listed as PEPS 403)

**MBBE 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. Important pollutants will be used as case studies to illustrate the principles. A-F only. Pre: CHEM 152 or CHEM 272 and CHEM 162 or 171; or consent. Spring only. (Cross-listed as PEPS 412) **DB**

**MBBE 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 GEOG 420 and NURS 430) **DB**

**MBBE 461 Biotechnology for Teachers (3)** Principles, methods, classical examples, recent development, benefits and concerns of modern biotechnology. Pre: BIOL 304 or equivalent.

**MBBE 480 Integrative Genomics and Biotechnology (3)** Integration of molecular genetics, virology, plant molecular biology, and bioinformatics. Gene silencing, functional genomics, and the development of expression systems for the production of heterologous proteins. A-F only. Pre: 401 and BIOL 275/275L; or consent. Fall only. **DB**

**MBBE 480L Integrative Genomics and Biotechnology Lab (3)** Laboratory to accompany 480. A-F only. Pre: 401 and BIOL 275/275L; or consent. Spring only. **DY**

**MBBE 491 Special Topics in MBBE (V)** Study and discussion of special topics and problems in molecular biosciences and bioengineering. Pre: consent.

**MBBE 499 Directed Research (V)** Limited to undergraduate students qualified to carry on research problems in plant physiology, biochemistry, and molecular biology. A-F only.

**MBBE 607 Advanced Food Science I (3)** Advanced topics in chemical and physical characteristics of foods as well as their role in human nutrition. Repeatable one time. A-F only. Pre: graduate student status with undergraduate courses in organic chemistry, microbiology, additional biological science, physics, and biochemistry. Basic knowledge of food science is expected; or consent. Fall only. (Cross-listed as FSHN 607 and TPSS 607)

**MBBE 608 Advanced Food Science II (3)** Advances in sensory quality and evaluation, deterioration of foods and food safety, as well as food processing technology. Repeatable one time. A-F only. Pre: graduate student status with undergraduate courses in organic chemistry, microbiology, additional biological sciences, physics, and biochemistry. Basic knowledge of food science is expected; or consent. Spring only. (Cross-listed as FSHN 608 and TPSS 608)

**MBBE 609 Advanced Food Safety (3)** Real and perceived food hazards, their ethical issues and implications, advanced emerging topics in food safety, and controls, including laws and regulations of food safety issues and public perception of food safety will be discussed. Repeatable one time. A-F only. Pre: graduate student status with undergraduate courses in biochemistry, microbiology, food processing, physics and organic chemistry. Basic food science knowledge is required; or consent. Spring only. (Cross-listed as FSHN 609 and TPSS 609)

**MBBE 610 Molecular Biosciences Seminar (1)** Study and discussion of significant topics and problems in plant physiology, biochemistry, and molecular biology. A-F only.

**MBBE 620 Plant Biochemistry (3)** Comprehensive study of chemical constituents and biochemical processes unique to the plant kingdom with emphasis on selected aspects of current interest. A-F only. Pre: 402 or consent.

**MBBE 621 Metabolic Engineering (4)** Principles and methodologies of metabolic engineering. Concepts of metabolic networks.

Establishment of metabolic flux analysis and metabolic control analysis. Systems biology framework for integration of mathematical modeling and global measurements at metabolite, protein and transcription levels. Pre: BIOL 275, MATH 311, and MICR 351; or consent.

**MBBE 651 Signal Transduction and Regulation of Gene Transcription (3)** Lecture/discussion on molecular mechanisms involved in the transmission of regulatory signals from the cell surface to the nucleus. A-F only. Pre: BIOC 620, 643, CMB 621, and 654 or equivalent; or consent. Fall only.

**MBBE 680 Methods in Plant Molecular Biology (3)** (1 Lec, 2 3-hr Lab) Advanced methodology and research strategies. Hands-on laboratory training in basic and current molecular procedures for plant research. Pre: one of BIOC 481 or BIOC 620.

**MBBE 687 Advanced Lab Techniques (1)** (1 Lec, 2 3-hr Lab) Advanced laboratory techniques used in life science research. Pre: 402 and 402L, or BIOC 441 and BIOC 441L, or FSHN 477; or consent. (Cross-listed as ANSC 687 and FSHN 687)

**MBBE 691 Advanced Special Topics in MBBE (V)** Study and discussion of advanced special topics and problems in molecular biosciences and bioengineering. Pre: graduate standing or consent.

**MBBE 699 Directed Research (V)**

**MBBE 700 Thesis Research (V)** CR/NC only.

**MBBE 701 Topics in Food Science (1)** Advanced topics in food science and technology, from basic to applied research, including current issues in food science and technology and critical analysis of current research literature. Repeatable one time. A-F only. Pre: graduate standing or consent. Spring only. (Cross-listed as FSHN 701 and TPSS 701)

**MBBE 800 Dissertation Research (V)** CR/NC only.

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## 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. **DH**

**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. **FG**

**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. **DA**

**MUS 114 University Chorus (1)** Performance of choral literature from Renaissance to present. Previous choral experience not required. Repeatable. **DA**



- 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. **DA**
- 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. **DA**
- MUS 123 (Alpha) Pacific Music Performance Class (1)** Basic principles of performance of Pacific music. Relevant problems at elementary level. (B) slack key guitar. Repeatable one time. Pre: 121D or 121E or consent. **DA**
- MUS 125 First-Level Secondary Piano (1)** Piano as secondary performance field; application of theory to problems in improvising, harmonizing, creating accompaniments, transposing, and sight-reading at keyboard. For music majors. Pre: consent. Co-requisite: 281 or consent.
- MUS 126 First-Level Secondary Piano (1)** Piano as secondary performance field; application of theory to problems in improvising, harmonizing, creating accompaniments, transposing, and sight-reading at keyboard. Continuation of 125. For music majors. Pre: 125 or consent.
- MUS 127 (Alpha) Asian Music Performance Class (1)** Basic principles of performance of Asian music. Relevant problems in literature at elementary level. (B) koto; (C) shamisen; (D) South Indian singing; (E) shakuhachi. Cannot be audited. Pre: consent. **DA**
- MUS 128 (Alpha) Asian Music Performance Class (1)** Basic principles of performance of Asian music. Relevant problems in literature at elementary level. (B) koto; (C) shamisen; (D) South Indian singing; (E) shakuhachi. Cannot be audited. Pre: consent. **DA**
- MUS 151 String Techniques and Methods (2)** For students preparing to teach instrumental music. Performance techniques, materials, and pedagogy for string instruments. A-F only.
- MUS 152 Instructional Techniques and Methods: Lower Strings (2)** Continuation of 151. Pre: consent.
- MUS 153 Woodwind Techniques and Methods (2)** Similar to 151 and 152 using upper woodwind instruments. A-F only.
- MUS 154 Woodwind Techniques and Methods II (2)** Continuation of 153. A-F only.
- MUS 155 Percussion Techniques and Methods (2)** Similar to 151 using percussion instruments. A-F only.
- MUS 156 Brass Techniques and Methods (2)** Similar to 151 using brass instruments. A-F only.
- MUS 199 Recital Attendance (0)** Attendance at approved departmental concerts. Required of all music majors (BMus, six semesters; BA and BEd, four semesters). Repeatable. CR/NC only.
- MUS 225 Second-Level Secondary Piano (1)** Continuation of 125–126; increased emphasis on piano literature up to intermediate level. Pre: 126 or consent.
- MUS 226 Second-Level Secondary Piano (1)** Continuation of 225. Pre: 225 or consent.
- MUS 240 Creative Applications of Music Technology (3)** Introductory laboratory experience. Teaches musicians fundamental technology concepts through creative projects. Exposes students to a variety of music and audio software. A-F only. Pre: music majors or minors or consent.
- MUS 251 Diction for Singers (2)** Diction and phonetics of English, Italian, and liturgical Latin for singers and choral conductors. Pre: consent.
- MUS 252 Diction for Singers (2)** Diction and phonetics of French and German for singers and choral conductors. Pre: consent.
- MUS 253 Basic Experiences of Music (3) (3 Lec, 1 1-hr Lab)** Music fundamentals: time, pitch, media, musical expression, form. Use of rhythm instruments, recorder, 'ukulele, bells, autoharp, keyboard, etc.; listening; movement; notation; analysis of music. **DA**
- MUS 261 Music Research Techniques (1)** Introduction to library sources and research in music.
- MUS 265 History of Western Music to 1750 (3)** Development of Western music from its origins to 1750. Styles, schools, composers. Pre: 282 or consent. **DH**
- MUS 266 History of Western Music After 1750 (3)** Development of Western music from 1750 to the present. Styles, schools, composers. Pre: 282 or consent. **DH**
- MUS 280 Basic Theory and Aural Skills (3)** Fundamentals of music theory, notation, sight-singing, and dictation. Pre: 108 or consent.
- MUS 281 Theory I (2)** Materials and organization of music; analysis, writing, and keyboard application. Pre: 180 or consent. Co-requisite: 283 or consent.
- MUS 282 Theory II (2)** Continuation of 281. Pre: 281 or consent. Co-requisite: 284 or consent.
- MUS 283 Aural Training I (1)** Problems in perception, identification, and notation of musical sounds. Emphasizes sight-singing. Cannot be audited. Pre: 180 and ability to sing diatonic melodies at sight, or consent. Co-requisite: 281 or consent.
- MUS 284 Aural Training II (1)** Continuation of 283. Pre: 283 or consent. Co-requisite: 282 or consent.
- MUS 285 Theory III (2)** Detailed study of theory: writing, analysis, keyboard application. Pre: 282. Co-requisite: 287.
- MUS 286 Theory IV (2)** Continuation of 285. Pre: 285. Co-requisite: 288.
- MUS 287 Aural Training III (1)** Advanced problems in perception, identification, and notation of musical sounds. Sight-singing. Pre: 284. Co-requisite: 285.
- MUS 288 Aural Training IV (1)** Advanced problems in perception, identification, and notation of musical sounds. Sight-singing. Pre: 287. Co-requisite: 286.
- MUS 289 Introductory Practicum in Music Composition (2)** Original composition; specific approaches to creative writing. Repeatable. Pre: 282 or consent.
- MUS 311 (Alpha) Ethnic Music Ensembles I (1)** Performance of literature for groups of various sizes and kinds at introductory level (B) Hawaiian; (C) Japanese; (D) Chinese; (E) Korean; (F) Okinawan; (G) Philippine; (H) gamelan; (I) gagaku; (J) Tahitian; (K) Oceanic; (M) other. Repeatable. Pre: upper division standing or consent. **DA**
- MUS 312 Hula/Chant Ensemble I (2)** Ancient style. Pre: upper division standing or consent. **DA**
- MUS 325 Conducting (1)** Problems in directing instrumental and choral ensembles. Score reading, rehearsal techniques, and basic interpretive problems. Pre: 282.
- MUS 326 Conducting (2)** Continuation of 325.
- MUS 340 Electronic Music (3)** Basic techniques of electronic sound synthesis. Pre: 240 or consent.
- MUS 353 Music in the Elementary School (2)** Music concepts and literature appropriate for elementary schools. Basic materials and procedures. Not for majors in elementary school music (vocal/general). Pre: 253 or consent.
- MUS 354 Music Education: Elementary (3)** Required for K-12 music specialists. Scope and nature of music in children's lives; planning, teaching, learning, and evaluating music in elementary curriculum. A-F only. Pre: 286 or consent.
- MUS 355 Music: Secondary Instrumental (3)** Objectives, materials, procedures of instrumental music in secondary schools. A-F only. Pre: 286 and 326 (or concurrent); or consent.
- MUS 356 Music: Secondary Vocal (3)** Objectives, materials, procedures of choral music in secondary schools. A-F only. Pre: 286 or consent.
- MUS 358 Piano Pedagogy (2)** Concepts, materials, and procedures for class and individual instruction in piano. Pre: 282.
- MUS 359 Piano Pedagogy (2)** Continuation of 358.
- MUS 370 Music in Modern America (3)** Varieties of music, including jazz and other popular forms; relevant antecedents. Pre: sophomore standing; freshmen with consent only. **DH**
- MUS 381 Counterpoint (3)** Form, texture, and style in music literature from Renaissance to present. Formal analysis and writing. Contrapuntal textures and forms. Pre: 286.
- MUS 382 Form and Analysis (3)** Form, texture, and style in music literature from Renaissance to present. Formal analysis and writing. Larger forms with various textures; recent contemporary approaches to continuity. Pre: 265, 266, and 286.
- MUS 383 Orchestration (3)** Basic principles of scoring for orchestra and band; instrumental ranges, timbres, transpositions; transcribing or composing for band, orchestra, and chorus. Pre: 286 or consent.
- MUS 386 Theory and Practice of Jazz Improvisation (2)** Development of an improvising technique through analysis and performance practice. For instrumentalists only. Pre: 285 and 287.
- MUS 387 Contemporary Techniques (2)** Theoretical techniques in music of the 20th and 21st centuries; emphasis on writing as the

synthesis of concepts. Investigation of important stylistic movements. Pre: 286 or consent.

**MUS 399 Directed Study (V)** Limited to majors with a minimum cumulative GPA of 2.7 or a minimum GPA of 3.0 in music. Pre: consent.

**MUS 400 Topics in Music (V)** Topics in history, literature, theory, applied music, music education, and ethnomusicology; for music majors. Consult department for topics and specific dates. Pre: 281 and appropriate lower division music courses; or consent.

**MUS 407 Music Cultures of the World (3)** Folk, popular, and art music from major regions of the world, with emphasis upon Asia and the Pacific, representative styles and regional characteristics. Pre: junior standing or consent. **DH**

**MUS 410 (Alpha) Ensembles (1)** Performance of literature for ensembles and performing groups of various sizes and kinds; (B) Hawaiian chorus; (C) University Chamber Singers; (D) piano-vocal collaboration; (F) chamber music; (G) guitar; (K) jazz; (M) contemporary music; (N) theater music; (O) percussion; (P) flute. Repeatable. Pre: audition or consent. **DA**

**MUS 411 (Alpha) Ethnic Music Ensembles II (1)** Performance of literature for ensembles and performing groups of various sizes and kinds, (B) Hawaiian; (C) Japanese; (D) Chinese; (E) Korean; (F) Okinawan; (G) Philippine; (I) Asian. Repeatable. Pre: 311 in same section or consent. **DA**

**MUS 412 Hula/Chant Ensemble II (2)** Ancient style. Pre: 312 or consent.

**MUS 413 Hula/Chant Ensemble III (2)** Ancient style; hālau protocol. Repeatable. Pre: 412.

**MUS 414 University Concert Choir (1)** Performance of a cappella literature and major choral works. Repeatable. Pre: choral experience and consent. **DA**

**MUS 415 Opera Workshop (V)** Opera in performance. Styles and characterizations. Performance of scenes and one complete work. Repeatable. Pre: upper division standing or consent. **DA**

**MUS 416 (Alpha) University Symphony Orchestra (1)** Performance of orchestra literature, including major works for chorus and orchestra, opera and dance; (B) symphony; (C) chamber orchestra. Repeatable. Pre: audition or consent. **DA**

**MUS 417 University Javanese Gamelan (1)** Performance of jogja and solo gamelan traditions; *Ujon-Ujon, Wajang Kulit, Wajang Wong*. Repeatable. Pre: 311H or consent. **DA**

**MUS 418 Collegium Musicum (1)** Performance of medieval, Renaissance, and Baroque literature for ensembles and performing groups of various kinds and sizes. Repeatable. Pre: audition or consent. **DA**

**MUS 419 (Alpha) University Band (1)** Performance of literature, including works by contemporary composers. (B) symphonic wind ensemble; (C) symphonic band; (D) concert band; (E) marching band; (F) marching band percussion. Repeatable. Pre: audition or consent. **DA**

**MUS 420 (Alpha) Music Literature Lab (2)** Problems of style and interpretation and their implications in performance. Inquiry with laboratory performance. (B) solo voice. Repeatable. Pre: consent.

**MUS 421 Acting V: Musical Comedy (3)** Essential training in skills required to perform in musicals. Students present scenes from musical comedies for criticism and review. Repeatable two times. Pre: THEA 321 and THEA 322, audition, or consent. (Cross-listed as THEA 421) **DA**

**MUS 422 Piano Repertoire (1)** Focused study on a specific area of piano literature. Extensive score study, analysis, performance practices, technique and listening lists will be studied. A-F only. Pre: 2 semesters of 232C or consent. Repeatable five times. (Alt. years)

**MUS 423 Keyboard Skills I (2)** Practical keyboard applications including transposition, keyboard harmonization, figured bass, improvisation, score reading and sight reading. A-F only. Pre: 282 and 2 semesters of 232C or consent. (Alt. years)

**MUS 424 Keyboard Skills II (2)** Continuation of 423. A-F only. Pre: 423 or consent.

**MUS 440 Music, Industry, and Society (3)** History of U.S. music and recording industry. How industry relates to economy as a whole, and how it reflects broad patterns and trends in American culture and society. Pre: Upper division standing and/or consent. (Cross-listed as HIST 471) **DH**

**MUS 450 Music Technology for Teachers (3)** Studio course designed for music education majors or musicians interested in discovering and utilizing technology resources to enhance the music teaching or learning process. A-F only. Pre: 286 or consent.

**MUS 454 Music in Special Education (3)** Designed for music educators, elementary and special education majors or musicians interested in understanding and preparing to use music with special education students. A-F only. Pre: 253 or EDEP 311 or consent.

**MUS 455 Freshman Seminar Leader (6)** Peer teaching of introductory music courses through the freshman seminar program. Pre: upper division standing or consent.

**MUS 457 Asian and Pacific Music in Education (2)** Musical concepts in songs, dances, and instrumental music of Asia, Hawai'i, and other Pacific Islands, appropriate for K-12. Pre: 353, 354, or 355 and 356. (Cross-listed as ITE 457) **DA**

**MUS 458 Vocal Techniques for Solo and Ensemble Singing (2)** Scientific studies of vocal mechanism; application to techniques of singing. Pre: 282.

**MUS 459 Vocal Pedagogy (2)** Pedagogical methods for individual voice instruction; participation in applied music teaching. Pre: 458.

**MUS 461 (Alpha) Eras of Western Music History (3)** Changing styles and forms in periods of European art music from 500 A.D. to the present. (B) medieval; (C) Renaissance; (D) Baroque; (E) Classic; (F) Romantic; (G) 20th century. Pre: 265 and 266, or consent.

**MUS 462 (Alpha) Studies in Western Music History (3)** (B) music of the United States. Pre: 265 and 266, or consent.

**MUS 463 (Alpha) Topics in Music Literature (3)** (B) symphonic music; (C) concerto; (D) chamber music; (E) choral music; (F) solo song; (G) wind band literature; (H) guitar literature. Pre: 265 and 266, or consent.

**MUS 464 Opera (3)** Historical study from Monteverdi to present. Pre: 265 and 266, or consent.

**MUS 465 Keyboard Music (3)** Study of literature for harpsichord, piano, and organ from Renaissance to present; development of historical styles. Pre: 265 and 266, or consent.

**MUS 472 Sound Systems of World Musics (3)** Music-theoretical study of sound organization as defined by various cultures and development of aural analysis in world musics. Pre: junior standing or consent.

**MUS 477 History of Rock and Roll (3)** An examination of rock and roll from various perspectives including economics, regionalism, freedom of expression. Pre: upper division standing or consent. **DH**

**MUS 478 (Alpha) Musical Cultures (3)** The study of a musical culture area. (B) Hawai'i; (C) China; (D) Japan; (E) Korea; (F) Indonesia; (G) Philippines; (H) India; (I) Polynesia; (P) Africa; (Q) other. Pre: junior standing or consent.

**MUS 479 Topics in Ethnomusicology (3)** Problem-oriented cross-cultural investigation of music and music organization. Pre: junior standing or consent. **DH**

**MUS 485 Intermediate Practicum in Music Composition (V)** Creative writing beginning with smaller forms. Repeatable. Pre: 286 or consent.

**MUS 487 Advanced Practicum in Music Composition (3)** Creative writing in larger forms. Composition majors only. Repeatable. Pre: 485 or consent.

**MUS 495 Senior Project (1)** Capstone project designed by student, who must find and work with faculty adviser before enrolling. Also subject to advance approval by departmental committee. Repeatable one time. A-F only. Pre: senior standing and consent.

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

**MUS 600 (Alpha) Seminar (3)** Selected problems in (B) composition; (C) ethnomusicology; (D) music literature; (E) performance repertory; (F) music education; (H) theory. Repeatable. Pre: graduate standing or consent; also 661 for (D) and (E).

**MUS 601 Advanced Topics in Music (V)** Advanced topics in history, literature, theory, applied music, music education, and ethnomusicology; some in intensive modular format. Repeatable. Pre: appropriate lower division music courses or consent and graduate standing.

**MUS 610 Advanced Ensemble (1)** Projects in study and performance. Repeatable. Pre: consent.

**MUS 625 Advanced Conducting (2)** Conducting instrumental and choral groups. Pre: 326.

**MUS 626 Advanced Conducting (2)**

Continuation of 625.

**MUS 640 Philosophy and Aesthetics of Music (3)**

Exploration of major Western ideas in philosophy and aesthetics, and examination of Eastern and African traditions where they intersect or have relevance. Pre: consent.

**MUS 651 Foundations of Music Education (3)**

Music and music education in their philosophic, aesthetic, social, historical, and psychological dimensions. Pre: graduate standing and consent.

**MUS 653 Music Curriculum Theory and Design (3)**

Procedures for planning, teaching, evaluating, and administering music programs in elementary, secondary, and higher education. Evaluation of current programs; procedures for change. Pre: graduate standing and consent.

**MUS 655 Music in Childhood Education (3)**

Principles and programs in teaching music to children in early childhood settings and elementary school. Curriculum development, analysis of research, and current approaches. Pre: 353 or 354, teaching experience, and graduate standing. (Cross-listed as EDCS 655)

**MUS 657 World Musics in Undergraduate Education (2)**

Concepts and materials at junior college and undergraduate levels. Preparation for structuring and teaching courses in non-Western musics. Pre: graduate status in music and undergraduate ethnomusicology course (or concurrent).

**MUS 659 Seminar in College Music Teaching (3)**

Examines components of good teaching, adult learning theories, course organization, methodologies, evaluation, and other music issues. For students planning a college teaching career in music. Pre: consent.

**MUS 660 (Alpha) Studies in Music Literature (3)**

Detailed study by chronological period. (B) medieval; (C) Renaissance; (D) Baroque; (E) Classic; (F) Romantic; (G) 20th century. Repeatable. Pre: 661 or consent.

**MUS 661 Bibliography and Library Resources in Music (3)**

Basic materials and techniques; includes retrieval techniques from online computer catalog. Pre: graduate standing or consent.

**MUS 670 (Alpha) Regional Music (3)**

Musical content and historical/social context of principal musical traditions. (B) Asia; (C) Oceania. Repeatable. Pre: consent.

**MUS 678 (Alpha) Advanced Problems in Ethnomusicology (3)**

(B) transcription of music performance; (C) movement analysis; (D) other. Pre: consent.

**MUS 680 (Alpha) Studies in Music Theory (3)**

(B) stylistic counterpoint to 1700; (C) stylistic counterpoint from 1700; (D) advanced analysis; (E) comparative theory; (F) history of theory; (G) contemporary techniques and resources; (H) atonal analysis and set theory; (I) Schenkerian analysis. Pre: 286 and graduate standing.

**MUS 687 Masters Composition Practicum (3)**

Original composition in all forms. Masters-level composition students only. Repeatable five times. A-F only. Pre: consent.

**MUS 695 Plan B Master's Project in Music Education (V)**

Independent study for students

working on a Plan B Master's project. A grade of Satisfactory (S) is assigned when the project is satisfactorily completed. A maximum of 3 credits may be earned in MUS 695. A-F only. Pre: graduate standing in music education or consent.

**MUS 699 Directed Work (V)** Reading and research in ethnomusicology, musicology, music education; reading and practice in theory, composition, or performance. Pre: consent of chair and department chair.

**MUS 700 Thesis Research (V)****MUS 701 (Alpha) Topics in Music (3)**

Advanced topics in musicology; theory, ethnomusicology, and music education. (B) psychology of music; (C) research in music education; (D) research methods in musicology; (E) advanced diction for singers. Repeatable. Pre: appropriate to topic or consent.

**MUS 702 Seminar for Doctoral Students (V)**

Selected topics centering on areas pertinent to the student's degree needs and research interests. Pre: admission to PhD program in music or consent.

**MUS 750 (Alpha) Seminar in Music Education (3)**

Selected problems in music education. (B) childhood; (C) adolescence/adults; (D) major issues. Pre: graduate standing and consent.

**MUS 787 Doctoral Composition Practicum (3)**

Original composition in all forms. Doctoral-level composition students only. Repeatable five times. A-F only. Pre: consent.

**MUS 800 Dissertation Research (V)**

Pre: candidacy for PhD degree and consent of dissertation chair.

## APPLIED MUSIC

*For information on sections, requirements, and costs, consult the music department.*

*Instruction is given in 14 individual lessons per semester, either one half-hour lesson per week (1 credit hour) or one full-hour lesson per week (2 or more credit hours). Lessons are not made up unless instructor is notified a reasonable time in advance of the excused absence.*

*Registration for lessons and choice of teachers must be approved by the department chair.*

*Assignment and admission to these courses are based on tests and auditions given by the department during the advising and registration period. Applied music courses cannot be audited or taken CR/NC.*

**MUS 230 (Alpha) Elementary Applied Music, Ethnic (V)**

Instruction in instrumental performance at elementary level. Study of works representative of literature. (B) koto; (C) shamisen; (D) South Indian singing; (E) Hawaiian chant; (F) shakuhachi; (I) other; (J) gottuvadyam vina. Repeatable for four semesters. Pre: audition or consent.

**MUS 231 (Alpha) Applied Music, Western (1)**

For nonmajors or music majors in secondary performance fields. Individual instruction in solo vocal or instrumental performance at elementary level. Representative works. (B) voice; (C) piano; (D) organ; (F) recorder; (G) classical guitar; (H) violin; (I) viola; (J) cello; (K) double bass; (M) flute; (N) oboe; (O) clarinet; (P) bassoon; (Q) saxophone; (R) trumpet; (S) French horn; (T) trombone; (U) tuba; (X)

euphonium; (Y) percussion; (Z) other.

Repeatable for four semesters. Pre: audition or consent.

**MUS 232 (Alpha) Applied Music, Western (V)**

For music majors or intended majors. Individual instruction in solo or instrumental performance at first performance level. Representative works. Weekly repertoire laboratory required. (B) voice; (C) piano; (D) organ; (G) classical guitar; (H) violin; (I) viola; (J) cello; (K) double bass; (M) flute; (N) oboe; (O) clarinet; (P) bassoon; (Q) saxophone; (R) trumpet; (S) French horn; (T) trombone; (U) tuba; (X) euphonium; (Y) percussion; (Z) other. Repeatable for six semesters. Pre: audition.

**MUS 330 (Alpha) Advanced Applied Music, Ethnic (V)**

Individual instruction in instrumental and dance performance at advanced level. See 230 for list of sections. Repeatable for six semesters. Pre: advancement from 230 or consent.

**MUS 331 (Alpha) Applied Music, Western (V)**

For nonmajors or for music majors in secondary performance fields. Individual instruction in solo vocal or instrumental performance at an advanced level. See 231 for list of sections. Repeatable for six semesters. Pre: advancement from 231 or consent.

**MUS 332 (Alpha) Applied Music, Western (V)**

For music majors. Individual instruction in solo vocal or instrumental performance at the junior level. Representative works. Weekly repertoire laboratory required. Half recital required to complete junior level. See 232 for list of sections. Repeatable for three semesters. Pre: four semesters of 232 and promotion by board examination.

**MUS 432 (Alpha) Applied Music, Western (3)**

For music majors. Individual instruction in solo vocal or instrumental performance at the senior level. Representative works. Weekly repertoire laboratory required. Full recital required for completion of this performance level. See 232 for list of sections. Repeatable for three semesters. Pre: two semesters of 332 and advancement by board examination.

**MUS 635 (Alpha) Graduate-Level Applied Music (3)**

For students accepted for MMus in performance. Individual instruction in solo vocal or instrumental performance at graduate performance level. Representative works. (B) voice; (C) piano; (H) violin; (I) viola; (J) cello; (K) double bass; (M) flute; (N) oboe; (O) clarinet; (P) bassoon; (Q) saxophone; (R) trumpet; (S) French horn; (T) trombone; (U) tuba; (X) euphonium; (Y) percussion; (Z) other. Repeatable.

**MUS 636 Graduate Recital (V)**

For students accepted for MMus in performance. Individual instruction in solo vocal or instrumental performance at graduate level; full recital required. (B) voice; (C) piano; (H) violin; (I) viola; (J) cello; (K) bass; (M) flute; (N) oboe; (O) clarinet; (P) bassoon; (Q) saxophone; (R) trumpet; (S) French horn; (T) trombone; (U) tuba; (X) euphonium; (Y) percussion.