UPDATES TO 2005-07 CATALOG
for Courses and Curricula
Last Update: 1/26/06

The online 2005-07 Catalog in PDF format is an archival document and does not reflect changes that may take place during the period between publication dates. Updates are listed here for courses and curricular corrections or revisions. Any changes made since publication of the Catalog have been indicated, and the affected PDF pages have been provided with a red arrow (➡) and a link, via adjacent blue text, to a PDF version of this list.

New Courses (blue text links to file of course descriptions) were approved between printing of the Catalogs, and will be added in the next Catalog.

Experimental Courses (blue text links to file of course descriptions) provide academic credit, and provide an opportunity for experimentation in education. They are not included in the University Catalog.

For updates to other information in the Catalog, please see the appropriate web sites (e.g., Admissions, Academic Records, Financial Aid, Housing, etc.).

Effective as of: Spring 2007		
Item	**Page**	**Corrections/Revisions**
ASCI 290	333	Change the course (units, mode, description) to: ASCI 290 Livestock Management Enterprise (1-4) (CR/NC) Beginning field experience in animal production systems. May include health, nutrition, reproduction, management, processing, budgeting, and/or marketing exercises. Total degree credit for ASCI 290/ASCI 490 limited to 9 units. Credit/No Credit grading only. 1-4 lectures. Prerequisite: Consent of instructor.
ASCI 490	335	Change the course (units, mode, description) to: ASCI 490 Advanced Livestock Management Enterprise (1-4) (CR/NC) Advanced field experience in animal production systems. May include health, nutrition, reproduction, management, processing, budgeting, and/or marketing exercises as well as management decision-making opportunities. Total degree credit for ASCI 290/ASCI 490 limited to 9 units. Credit/No Credit grading only. 1-4 lectures. Prerequisite: Consent of instructor.
ASCI 581	335	Change the course (title, units, grading, prerequisite) to: ASCI 581 Graduate Seminar in Animal Science (1-4) (CR/NC) Current findings and research problems in the field and their application to the industry. Credit/No Credit grading only. Total credit limited to 12 units. 1-4 seminars. Prerequisite: Graduate standing and consent of instructor.
CRP 553	367	Change prerequisite to “CRP 512 or consent of instructor.”
Experimental Courses		AERO X517, BMED X500, BMED X530, BMED X591, BMED X592, CE X405, CE X589, CRP X424, ECON X464, ENGL X382 (GE C4), HIST X458, IT X545, MATE/ME X555, RELS X205
GSB 562, GSB 567	416	Change prerequisite to: Graduate standing and GSB 511, GSB 513, GSB 523, GSB 524, GSB 531, GSB 533 and either GSB 512 or IME 503 and either GSB 534 or IME 580 or approval from the Associate Dean of OCOB Graduate Programs.

IT 598 and IT 599	434	Change prerequisite to: Graduate standing, consent of instructor and IT 510, IT 512, IT 520 and IT 527 or approval from the Associate Dean of OCOB Graduate Programs.
LA 363	441	Change from (3) 3 lectures to (4) 3 lectures, 1 activity.
MATE 330	444	Change the course (title, mode, description, prerequisite) to: MATE 330 Hybrid Material Systems (4) Design of hybrid material systems, including polymer-matrix, ceramic-fiber composites. Materials (matrices, fibers) and manufacturing methods treated in detail. 3 lectures, 1 laboratory. Prerequisite: MATE 210, MATE 350, CE 204 or consent of instructor. Concurrent: MATE 370.
MATE 370	445	Change the course (title, mode, description, prerequisite) to: MATE 370 Process Design (4) Design of processes for engineering materials. Topics include kinetics in materials: solid-state diffusion (steady-state and non-steady-state), nucleation and growth kinetics, solid state phase transformations. 3 lectures, 1 laboratory. Prerequisite: MATE 360. Concurrent: MATE 330.
PHIL 230	461	Add crosslisting as HNRS 230.
SCM 300	477	Description corrected: Delete "2 lectures." This is an independent study course.
SCM 325	477	Change from (4) 3 lectures, 1 activity ***to*** (4) 4 lectures.
ZOO 426	489	Change from (4) 2 lectures, 2 laboratories ***to*** (4) 3 lectures, 1 laboratory. Change prerequisite to: "BIO 351 or consent of instructor. Recommended: Biochemistry course."

Effective as of: Winter 2007		
Item	**Page**	**Corrections/Revisions**
ART 201, ART 301, ART 353	329-331	Add to prerequisite, "…or consent of instructor."
BMED 450	New Courses	Change total credit limit from 4 to 16 units.
DANC 231, 232, 233, 332, 340	374	Change prerequisite to: "Intermediate level experience as determined by instructor at first class meeting."
DANC 234	374	Change prerequisite to: "DANC 134 or intermediate level experience as determined by instructor at first class meeting."
DANC 331	374	Change prerequisite to: "DANC 231 or intermediate level experience as determined by instructor at first class meeting."
DANC 381	374	Change prerequisite to: "KINE 419 or KINE 310, Dance Minor or consent of instructor."
Experimental Courses		ANT X345 (GE D5), BMED X563, CPE X133, EDUC X433, EDUC X508, EDUC X509, ENGL 468, HCS X415, POLS/RELS X380, PSY X472 (USCP), RELS X374 (GE C4), SCM X335 (GE Area F), STAT X523, UNIV X339 (GE Area F)
ENGL 399	395	Change from (2) 1 lecture, 1 laboratory to (2) 2 lectures.
HIST 324	420	Prerequisite changed to include "History majors will not receive GE Area D5 credit."
HIST 505	422	Prerequisite replaced to state "Graduate standing in History and consent of instructor."

MATE 310	444	Change the course (title, mode, description, prerequisite) to: MATE 310 Noncrystalline Material Systems (4) Design and synthesis of noncrystalline material systems. Synthesis, processing techniques, properties and fabrication methods of organic and inorganic polymeric materials. 3 lectures, 1 laboratory. Prerequisite: MATE 210. Concurrent: MATE 350.
MATE 350	444	Change the course (title, units, mode, description, prerequisite) to: MATE 350 Structural Materials Systems (4) Design of structural materials systems. Topics include continuum mechanics–stress, strain, elasticity, anelasticity, plasticity. 3 lectures, 1 laboratory. Prerequisites: MATE 210, CE 204; MATE 310 should be taken concurrently.
MBA and Another Master's Degree	178	For "Option to Concurrently Pursue MBA & Another Master's Degree" Correct the last sentence of the second paragraph to read, "The two degrees must be awarded in the same quarter."
MCRO 402	451	Change from (4) 3 lectures, 1 activity to (4) 3 lectures, 1 laboratory.
MU 200	457	Change from (1) to (1-2) independent study.
POLS 470	468	Change credit limit: Total credit limited to 12 units.

Effective as of: Fall 2006		
Item	**Page**	**Corrections/Revisions**
AG 200		New course, added to course inventory. Effective Fall 2006.
AG 400		New course, added to course inventory. Effective Fall 2006.
ASTR 200		New course, added to course inventory. Effective Fall 2006.
ASTR 400		New course, added to course inventory. Effective Fall 2006.
BIO 419	337	Change from (4) 4 lectures to (4) 3 seminars, 1 activity.
BMED courses		New courses, added to course inventory.
BUS 346	344	STAT 252 is no longer a required prerequisite.
BUS 419	346	Change prerequisite to "BUS 418 and STAT 252."
Comparative Ethnic Studies, BA		New program, approved and effective Fall 2006.
EDUC 412	379	Change from (4) 2 lectures, 1 laboratory, 1 activity to (4) 2 lectures, 2 activities.
EDUC 414	379	Change from (4) 2 lectures, 1 laboratory, 1 activity to (4) 2 lectures, 2 activities.
EDUC 416	379	Change from (4) 2 lectures, 1 laboratory, 1 activity to (4) 2 lectures, 2 activities.
EDUC 433	380	Add "Repeatable to 4 units."
EDUC 450	380	Change from (4) 3 seminars, 1 activity to (5) 3 seminars, 2 activities.
EDUC 452	380	Change from (4) 3 seminars, 1 activity to (5) 3 seminars, 2 activities.
EDUC 544	382	Change from (4) 3 seminars, 1 activity to (5) 3 seminars, 2 activities.
EDUC 550	383	Change from (4) 3 seminars, 1 activity to (5) 3 seminars, 2 activities.

ENGL 506	396	Change from Credit/No Credit to Regular grading.
New ES courses	401-402	New courses, added to course inventory: ES 241 (GE D3, USCP), ES 242 (GE D3, USCP), ES 243 (GE D3, USCP), ES 244 (GE D3, USCP), ES 310 (GE D5, USCP), ES 381 (GE D5, USCP), ES 390, ES 410, ES 450, ES 461.
ES 200	401	Change from 1-2 units to 1-4 units, and strike statement, "…with a maximum of 2 units per quarter."
ES 300	401	Change first sentence to read, "Overview of contemporary Chicano/a non-fiction literature since 1848." Change prerequisite to: "Completion of GE Areas A and C1."
ES 400	402	Change from 1-2 units to 1-4 units; strike statement, "with a maximum of 2 units per quarter"; change prerequisite to: "Junior standing and consent of department head."
Experimental Courses		CE X488, CE X588, CRP X463, DSCI X123, DSCI X461, HIST X319 (GE D5), MATE X424, MATH X504, POLS X510, PSY X375, WVIT X101, WVIT X404
FNR 215	402-3	Change from (1) 1 laboratory to (2) 1 lecture, 1 laboratory. Add to course description, "Trigonometric functions and fundamental identities especially as applied to natural resources applications."
FNR 340	404	Change from (2) 2 lectures to (3) 3 lectures. Change course description to "Wildland fuels, fire weather, and fire danger ratings in chaparral, grassland, and forested areas. Advanced modeling of surface and crown fire behavior. Fire management strategies and implications. Policies and objectives of fire management organizations. Saturday field trips may be required."
JOUR 400	435	Change from 1-2 units to 1-4 units, and total credit limit changed from 4 to 8 units, with a max of 4 units per quarter.
KINE 250	436	Change from 3 lectures, 1 recitation (discussion) to 4 lectures.
KINE 255	436	Change from 3 lectures, 1 recitation (discussion) to 4 lectures.
MATE 340	444	Change from (3) 3 lectures to (4) 3 lectures, 1 laboratory.
MATE 360	445	Change from (4) 4 lectures to (4) 3 lectures, 1 laboratory.
Research Specialization, MS Aerospace Engineering	201	New specialization approved.
Space Systems Engineering, MS Aerospace Engineering	201	New specialization approved.
TH 480	486	Change maximum repeatability from 4 units to 8 units.

Effective as of: Summer 2006

Item	Page	Corrections/Revisions
Experimental Courses		AGED X526, GSB X563, WVIT X339

Effective as of: Spring 2006

Item	Page	Corrections/Revisions
EDUC 427	379	Course reinstated (with modifications), effective Spring 2006.

Experimental Courses		BIO/MATE X232, BRAE X320, BUS X290, CE X536, CRP X458, HCS X575, HIST X210 (with GE D3), HNRS X324 (GE D5), IT X457, MATH X425, UNIV X330 (GE Area F), WVIT X202
HNRS 200	424	Change from Regular grading to Credit/No Credit grading.

Effective as of: Winter 2006		
Item	**Page**	**Corrections/Revisions**
Experimental Courses		AGB X404, EE X231, EE X248, EE X344, ENGL X201, ENGL X469, ENVE X472, ENVE X550, HIST X208, HIST X210 (see also Spring 2006), HNRS X380, LS X475, MATE X222, MATE X322, SPAN X302.
MCRO 436	451	Units changed, from (5) 3 lectures, 2 laboratories, to (4) 3 lectures, 1 laboratory.
ME 402	452	Mode change, from (4) 4 lectures to (4) 3 lectures, 1 laboratory.

Effective as of: Fall 2005		
Item	**Page**	**Corrections/Revisions**
ARCH 485	328	Units changed from (6) to (4 or 8).
Art Minor	242	For advisor approved electives, second section: Complete a minimum of 11, not 10 units from 300-400 level courses. Total units for minor is 30, not 29.
Biomedical Engineering, BS		New program, approved and effective Fall 2005.
CHEM 201	354	Mode change from (1-3) supervision to (1-3) laboratories.
CHEM 401	356	Mode change from (1-3) supervision to (1-3) laboratories.
CHEM 463	356	Mode change from (1) supervision to (1) laboratory.
Experimental Courses		CSC X225, ES X310 (GE D5, USCP), FNR X340, HIST X425
History, MA		New program, approved and effective Fall 2005.
Interdisciplinary Studies, BA		New program, approved and effective Fall 2005.

Effective as of: Summer 2005		
Item	**Page**	**Corrections/Revisions**
Academic Calendar	8-9	Update 6/28/05, 9/27/05, 1/11/06, 4/5/06, 6/27/06, 10/3/06, 1/17/07, and 4/10/07 to read, “Last day to enter ePermit numbers; last day to pay fees by 4 pm” Update 6/29/05, 9/28/05, 1/12/06, 4/6/06, 6/28/06, 10/4/06, 1/18/07, and 4/11/07 to read, “Last day to add a class via a pending ePermit. Last day to drop a class”
AGC 426	319	A 4-unit course: 2 lectures, 2 activities, not 2 lectures, 1 activity.
AGED 422	320	New course to be included in course inventory.
Agricultural Science, BS	109	For GE Area B it should read, “Area B Science and Mathematics (8 units)” not “(12 units)”. For GE Area D/E it should read, “Area D/E Society and the Individual (16 units)” not “(20 units)”.
ARCE 481	324	Course reinstated; valid through 2005-07 Catalog.

Architecture, Bachelor of	152	Last entry under Professional Electives, in second column on page 152, is no longer available: "~~Any MBA, Architectural Management Track course~~."
BIO 151	335	Final term as valid course: Summer 2005. Replaced by BIO 161.
BIO 152 and BIO 153	335-6	Final term as valid courses: Summer 2005.
City and Regional Planning, BS	156	For GE Area D/E it should read, "Area D/E Society and the Individual (20 units)" not "(16 units)".
CPE 400	362	Change units from (1-2) to (1-4); delete "…with a maximum of 2 units per quarter."
EDUC 500	381	Change from "Only 6 units may be applied to degree requirements" to "Total credit limited to 8 units."
EE 442	387	Title should read, "Electromagnetic Fields and Transmission Laboratory".
ENGL 391	395	Delete "Class Schedule will list topic selected. Total credit limited to 8 units." The course is not repeatable with different subtitles.
Experimental Courses		AERO X465, ARCH X370 (GE C4, USCP), CE X452, CE X503, CHEM X220, CHEM X240, EE X424, EE X440, EE X441, EHS X521, ERSC X544, ES X370 (GE C4, USCP), GEOL X395, GSB X528, GSB X529, HUM X450, JOUR X415, LS X213, LS X214, MATE X130, MATE X510, MATE X550, ME X540, ME X565, ME X579, PE X181, PEM/PEW X195, SCM X330 (GE Area F), SOC 450, STAT X320, UNIV X333 (GE Area F), UNIV X350 (GE Area F), UNIV X361 (GE C4).
General Education Requirements Charts 2 & 3	70, 71	General Education Charts 2 and 3 apply for the 2005-07 Catalog as well as the 2001-03 and 2003-05 Catalogs (corrections to headings of charts)
Integrated Technology Management Specialization, MS Engineering	196	Total units is 45, not 47/48. "Approved electives" not a part of Required Courses list.
Kinesiology, BS	295	Footnote 1 added to Exercise Science and Health Promotion Concentration, "Students following the Exercise Science and Health Promotion Concentration are to take KINE 219, KINE 220 and KINE 227, and one additional unit (see Major Courses, KINE 206-229)."
Liberal Arts, BA	256	Elementary Education Concentration in BA Liberal Studies is no longer offered.
Liberal Arts, BA	257	KINE 310 is a 3-unit course; thus the total units for the program is 181, not 180.
Liberal Arts, BS	258	KINE 310, one of the Major Courses required, is a 3-unit course; thus the total units for the program is 191, not 190.
ME 400	452	Change units from (1-2) to (1-4); delete "…with a maximum of 2 units per quarter."
MSL 314	455	Correct prerequisites are: "MSL 301, MSL 302, MSL 303, and consent of instructor."
Physics, BS	304	For the Electronics Concentration and the Electro-Optics Concentration, the first sentence for each should begin, "Students will not be allowed to enroll in EE 228 until they have …"
Software Engineering, BS	215	Total units is 192, not 190.

California Polytechnic State University
San Luis Obispo

EXPERIMENTAL COURSES — 2005-07

(Summer 2005 through Spring 2007)

Updated 1/26/07

Valid academic courses that are not included in the University Catalog. They provide an opportunity for experimentation without delays for courses that are necessary, before new courses and programs can be reviewed for inclusion in the University Catalog.

AERO X465 Thermodynamic Models for Aircraft Turbine Engines (4)

Modeling of air breathing propulsion systems based on the Brayton Cycle with applications to design point and off design point performance estimation and optimization applied to subsonic and supersonic aircraft. 4 lectures. Prerequisite: Senior standing; concurrent: AERO 443.

AERO X517 Multidisciplinary Design and Optimization (4)

Numerical optimization applied to the design of complex systems. Multi-criteria decision making, unconstrained and constrained optimization methods, system sensitivity analysis, system decomposition techniques, and multidisciplinary design optimization. 4 lectures. Prerequisite: Familiarity with programming in Matlab. Graduate standing or consent of instructor.

AGB X404 Food Retail Management (4)

Retailing of food products with focus on consumer marketing. Food product, promotion, pricing, distribution of food products with emphasis on various channels of food retailing. Store level strategies, new product roll out, category and vendor management, center store, niche food retailers. 4 lectures. Prerequisite: AGB 301 or consent of instructor.

AGED X526 Curriculum Development in Horticultural Sciences (3)

Development of lesson plans that meet educational state standards and that provide sound background for entry into the “Green Industry” or for entrepreneurial endeavors. Teaching methods and identification of resources and materials. 2 lectures, 1 activity. Prerequisite: HCS 120 or EHS 230, senior or graduate standing. Open to agricultural educators or credential students only.

ANT X345 Human Behavioral Ecology (4) GE D5

Biological and cultural influences of natural and sexual selection on individual behavior. Ecological effects on human behavior to reproduce and acquire resources. Scientific method for understanding foraging behavior, group living, social skills, kinship, parenting, religion, and mating. Cross-cultural, cross-sex, and cross-species comparisons. 4 lectures. Prerequisite: Completion of one GE B2 and one lower-division Area D course.

ARCH X370 Native American Architecture and Place (4) GE C4 USCP
(Also listed as ES X370)

The role of culture and setting in the construction of spatial, material and landscape concepts and artifacts, through the introduction of selected North American cultures, with focus from 1300 AD through contemporary time. 4 lectures. Prerequisite: GE Area A, GE Area C3.

BIO X232 Nanotechnology, Human Biology, Ethics and Society (4)
(Also listed as MATE X232)

Focus on four nanotechnology examples as focal points for the themes of nanoscale science and technology, human biology, society, ethics, and systems thinking: gold nanoshells for cancer treatment; molecular manufacturing; tissue engineering for a vital organ; and a microfluidic glucose sensor. The focal points provide natural contexts for learning biology at the cellular level, the molecular level, the organ level and the biological systems level, respectively. 4 lectures. Prerequisite: GE Areas B1-B3.

BMED X500 Individual Study (2-4)

Individual investigation, research, studies or surveys of selected problems. Advanced study planned and completed under the direction of faculty. Open to graduate students who have demonstrated the ability to do independent work. Total credit limited to 8 units. Prerequisite: Graduate standing and consent of department chair.

BMED X530 Biomaterials (4)

Structure-function relationships for materials in contact with biological systems. Interactions of materials implanted in the body. Histological and hematological considerations including foreign body responses, inflammation, carcinogenicity, thrombosis, hemolysis, immunogenic and toxic properties. Microbial interaction with material surfaces, degradation. 4 lectures. Prerequisite: ENGR 213, MATE 210 and graduate standing or consent of instructor.

BMED X563 Biomedical Engineering Graduate Seminar (2)

Selected topics of interest to biomedical engineering and other graduate students. Open to graduate students and selected seniors. A forum to share information about research, and research tools, an opportunity to discuss topics of interest with professionals in the field, academics and other graduate students. Schedule of

Classes will list topic selected. Total credit limited to 4 units. 1 seminar, 1 laboratory. Prerequisite: Graduate standing or consent of instructor.

BMED X591 Thesis Project Design Laboratory I (2)

Selection and completion of project by individuals or team which is typical of problems graduates must solve in their fields of employment or applied research. Project may involve, but is not limited to, physical modeling and testing of integrated design projects, costs, planning, scheduling and research and may involve students from several disciplines. Formulation of outline, literature review, and project schedule. 2 laboratories. Prerequisite: Graduate standing.

BMED X592 Thesis Project Design Laboratory II (2)

Continuation of BMED X591. Completion of project by individuals or team which is typical of problems graduates must solve in their fields of employment or applied research. Project may involve, but is not limited to physical modeling and testing of integrated design projects, costs, planning scheduling and research and may involve students from several disciplines. Formulation of outline, literature review, and project schedule. 2 laboratories. Prerequisite: BMED X591 or consent of instructor.

BRAE X320 Principles of BioResource Engineering (4)

Theory and applications of bioprocess technology in biological and agricultural systems. Engineering properties of biological materials and organisms. Basic unit operations, fluid mechanics and heat/mass transfer as applied to bioprocess technology. Special requirements of agricultural and biological processes. 3 lectures, 1 laboratory. Prerequisite: BRAE 128, BRAE 232, BRAE 236, CHEM 125, PHYS 132, BIO 213 and BRAE 213 or ENGR 213, or MCRO 221.

BUS X290 Business Programming (4)

Fundamentals of computer programming related to business applications. Application development using graphical user interface controls, variables, data types, and input/output with text files. 4 lectures.

CE X405 Concrete Materials (4)

Supplementary cementitious materials and chemical admixtures and their incorporation into concrete mix designs. Design and testing of concrete for durability and other specialized properties. 3 lectures, 1 laboratory. Prerequisite: CE 259.

CE X452 Advanced Reinforced Concrete Design (4)

A second course in design of reinforced concrete structures with emphasis placed on reinforced concrete behavior and design applications. Topics include deflection calculations, inelastic behavior of reinforced concrete components and systems, strut-and-tie modeling, seismic detailing, and two-way slabs. 4 lectures. Prerequisite: CE 355.

CE X488 Civil Engineering Risk Analysis (4)

Introduction to the basic concepts of probability theory, statistics, and decision theory as they pertain to problems in civil and environmental engineering. Emphasis on the use of probabilistic modeling, Bayesian statistics, risk analysis, and decision theory. 4 lectures. Prerequisite: CE 381.

CE X503 Nonlinear Analysis and Structural Modeling (4)

Introduction into nonlinear structural analysis of structural systems from fundamental principles to use of available software to solve problems. Topics include nonlinear geometric and material effects, distributed plasticity line elements both in the stiffness and flexibility domain, lumped plasticity models, and second order stability analysis. 4 lectures. Prerequisite: CE 501.

CE X536 Computer Applications in Water Resources with Geographic Information Systems (GIS) (4)

Modeling, design and analysis of water, wastewater, stormwater systems. Integration of water resources systems with Geographic Information Systems (GIS). 3 lectures, 1 laboratory. Prerequisite: CE 336; corequisite: CE 440.

CE X588 Ground Improvement (4)

Investigation of ground improvement applications for modification of geomechanical and hydraulic properties of soils. Engineering properties of soft ground and high water content materials. Investigation of mechanical, chemical, and thermal stabilization for foundation and environmental remediation applications. 4 lectures. Prerequisite: CE 381, CE 382, and CE 481.

CE X589 Geosynthetics Engineering (4)

Geosynthetics applications within civil engineering. Design content for geotechnical, geoenvironmental, and transportation applications. Manufacturing processes, material properties, interaction with soils, and service conditions. 4 lectures. Prerequisite: CE 481.

CHEM X220 Introduction to Chemical Oceanography (1) (CR/NC)

Chemical composition of seawater, especially the mechanisms that control the concentration of each element. Interrelationships of chemical, biological, geological, and physical oceanography integrated into each topic . Credit/No Credit grading only. 1 lecture. Available to students aboard *The Golden Bear* on the Cal Poly at Sea Cruise.

CHEM X240 ARGO Float Deployment (1) (CR/NC)

Student participation in the ARGO float program which collects data about the temperature and salinity of seawater world-wide, both at the surface and at depths up to 2000 meters. Credit/No Credit grading only. 1 lecture. Available to students aboard *The Golden Bear* on the Cal Poly at Sea Cruise.

CPE X133 Digital Design (4)

Number systems, Boolean algebra, Boolean functions, and function minimization. Analysis and design of combinational and sequential logic circuits. Hardware Description Language (HDL) concepts and applications, digital design and synthesis in Programmable Logic Devices (PLDs). 3 lectures, 1 laboratory. Prerequisite: CSC 101 or equivalent.

CRP X424 Reflections of Planning in Cinema (3)

Analysis of the depiction of planning and related themes in film. Critical reflection through these depictions on the effects of planning practices, institutions, and idiosyncrasies on society. Dialectical discussion of planning history, theory, and practice with themes that emerge from particular films. 2 lectures, 1 activity. Prerequisite: CRP 212, CRP 501, or equivalent.

CRP X458 Community Safety Planning and Design (4)

Creation of safer, more resilient cities through systematic application of urban disaster risk reduction and regeneration planning principles and methods. Integration of insights from design, resource management, and urban administration professions for minimizing disaster losses and facilitating recovery. 4 lectures. Prerequisite: Consent of instructor.

CRP X463 Senior Project Professional Practice (4)

Practical applications of city and regional planning theory and practice solving problems related to the built environment. Assembly of project documents and reports that meet the senior project requirement. 4 seminars. Prerequisite: CRP 411 and senior standing.

CSC X225 Introduction to Computer Organization (4)

Introduction to computing systems. Study of a simple instruction set architecture and the computer hardware needed to implement that architecture. Machine and assembly language programming. 3 lectures, 1 laboratory. Prerequisite: CPE 129/169; CSC 102.

DSCI X123 Dairy Science Orientation (1) CR/NC

Curricula, career paths, and opportunities for involvement in the dairy industry. Campus resources and tips for academic success. Student and professional organizations and affiliations. Meet and interact with each member of the faculty, Dairy Club officers, and industry guests. Credit/No Credit grading only. 1 lecture.

DSCI X461 Senior Project (3)

Selection and completion of a project under faculty supervision. Projects typical of problems which graduates must solve in their fields of employment. Project results presented in a formal written report. 2 lectures and supervised work. Prerequisite: Junior or senior standing.

ECON X464 Applied Senior Project (4)

Analysis of selected topics and problems in directed individual or group-based projects. Projects require application of economic models, principles and theory to investigate important business, economic or social issues. Formal report required. 4 seminars. Prerequisite: ECON 311, ECON 313 and senior standing.

EDUC X433 Foundations of Bilingual Education (4)

History, theories, and practices associated with contemporary bilingual education in California and the U.S. Observation and limited teaching in bilingual classrooms. Approximately one-half of the class will be taught in Spanish. 3 seminars, 1 activity. Prerequisite: Spanish proficiency demonstrated by passing SPAN 122 or equivalent with a grade of B or better, or by consent of instructor.

EDUC X508 Digital Moviemaking for K-12 Educators (4)

Digital moviemaking as the centerpiece of constructivist learning projects in K-12 classrooms. Project-based. Tools and skills for digital moviemaking. Designing constructivist lessons that require K-12 students to make their own movies. 3 seminars, 1 activity. Prerequisite: EDUC 481 or EDUC 507 or consent of instructor.

EDUC X509 Robotics for K-12 Educators (4)

The use of robots as the centerpiece of constructivist learning projects in K-12 classrooms. Project-based. Learning to build and program robots and design constructivist lessons around them. No technical background

required. 3 seminars, 1 activity. Prerequisite: Consent of instructor.

EE X231 Supplemental Instruction for EE 211 (1) (CR/NC)

Homework problems and questions answered. Credit/No Credit grading only. 1 lecture. Concurrent enrollment in EE 211 required.

EE X248 Supplemental Instruction for EE 228 (1) (CR/NC)

Homework problems and questions answered. Credit/No Credit grading only. 1 lecture. Concurrent enrollment in EE 228 required.

EE X344 Supplemental Instruction for EE 314 (1) (CR/NC)

Homework problems and questions answered. Credit/No Credit grading only. 1 lecture. Concurrent enrollment in EE 314 required.

EE X424 Introduction to Remote Sensing (4)

Radiation characteristics, sensor platforms, satellite systems, system design tradeoffs, collection and transmission of radiometric data, active radar and microwave remote sensing, interpretation of data for various commercial and military applications. Case studies of representative applications. 3 lectures, 1 laboratory. Prerequisite: Senior or graduate standing in engineering or consent of instructor.

EE X440 RF Wireless Communications (3)

Antennas, propagation, transceiver and key components designs. Design and analysis of the RF stages of modern wireless communication systems. 3 lectures. Prerequisite: EE 314, EE 402, or consent of instructor. Concurrent: EE X441.

EE X441 RF Wireless Communications Laboratory (1)

Experimental investigation of RF communication wireless systems. Experiments on mixers, low noise amplifiers, frequency synthesizers and transceiver system integration. 1 laboratory. Prerequisite: EE 442. Concurrent: EE X440.

EHS X521 Growing and Selling Horticulture Products for Educators (3)

Skills and techniques of propagation and production of horticulture crops. Scheduling, growing media, construction and plant identification. Marketing plans and promotions. Teaching methods. Identification of resources and materials. Curriculum development. 2 lectures, 1 activity. Prerequisite: HCS 120 or EHS 230, senior or graduate standing, or consent of instructor. Open to Education master's students only.

ENGL X201 Introduction to Literary Studies (4)

Introduction to the major genres typical of literature in different periods. Introduction to the forms of writing and research methods typical of literary criticism. 4 lectures. Prerequisite: Completion of GE Area A.

ENGL X382 LGBT Literature and Media (4) GE C4

Representations of lesbian, gay, bisexual, transgendered individuals and issues, late 19th century to the present. Topics covered: the closet, homophobia, coming out, AIDS, same-sex marriage, intersections of sexuality, race, class, gender identity. 4 lectures. Prerequisite: Completion of GE Areas A and C1.

ENGL X468 The Rhetoric of the Image (4)

The complicated and dependent relationship between still and moving images and written texts. How images and print communicate rhetorically with people as readers, viewers, and consumers. 4 seminars. Prerequisite: Completion of GE Area A and junior standing.

ENGL X469 Women's Rhetoric(s): Definitions, Contexts, Issues (4)

Theoretical questions about what constitutes women's rhetoric(s). How women have used and accommodated traditional methods of argument to argue for and enact a changed world. 4 lectures. Prerequisite: Completion of GE Areas A and C4.

ENVE X472 Water Filtration Design (3)

Design and construction of a small-scale water filtration system. Theory of slow sand filtration, activated carbon adsorption and other processes governing water filtration. 2 lectures, 1 laboratory. Prerequisite: ENVE 331.

ENVE X550 Environmental Management Systems (4)

Environmental management for industry. Understanding the language and intent of ISO 14000 and other environmental management standards. Application in industry, to provide best practice solutions using environmental engineering fundamentals, pollution prevention and cost/benefit analyses. Field and/or project

work. 3 lectures, 1 laboratory. Prerequisite: Senior or graduate standing.

ERSC X544 Earth Sciences for Educators (3)

An interdisciplinary earth science course which emphasizes the understanding of Earth as multiple systems of interrelated air, water, land, life, and social processes. A science-based curricula incorporating concepts, learning resources, and application in the field. 3 lectures. Prerequisite: Graduate or senior standing.

ES X310 Hip-Hop, Poetics and Politics (4) GE D5 USCP

Dynamics of hip-hop culture, its historical development, political significance, and social influence. How hip-hop exemplifies cross-cultural hybridization within not only Black communities nationally and internationally, but also amongst indigenous, Latino/a, and Asian peoples in the U.S. and beyond. 4 lectures. Prerequisite: Completion of GE Area A and two courses from D1, D2, D3 or D4.

ES X370 Native American Architecture and Place (4) GE C4 USCP
(Also listed as ARCH X370)

The role of culture and setting in the construction of spatial, material and landscape concepts and artifacts, through the introduction of selected North American cultures, with focus from 1300 AD through contemporary time. 4 lectures. Prerequisite: GE Area A, GE Area C3.

FNR X340 Wildland Fire Management (3)

Wildland fuels, fire weather, and fire danger ratings in chaparral, grassland, and forested areas. Advanced modeling of surface and crown fire behavior. Fire management strategies and implications. Policies and objectives of fire management organizations. Saturday field trips may be required. 3 lectures. Prerequisite: FNR 204 or consent of instructor.

GEOL X395 Structural Geology (4)

Recognition, interpretation, and depiction of geologic structures. Understanding rock deformation through study of faults and folds. Required weekend field trips. Letter grade only. 3 lectures, 1 laboratory. Prerequisite: GEOL 201, GEOL 241, ERSC 223.

GSB X528 Commercial Development of Innovative Technologies (4)

Conceptual business frameworks for commercialization of new and innovative products and technologies. Business aspects of innovative technologies as they relate to core functional areas such as finance,

accounting, marketing, operations, and business and intellectual property law. 4 lectures. Prerequisite: OCOB graduate standing or approval from the OCOB Associate Dean of Graduate Programs.

GSB X529 Effective Communication Skills for Managers (4)

Enhancement of business writing and oral presentation skills, organized around two areas: 1) preparing written business documents and reports, and 2) professional oral presentation skills. Preparation of a variety of business reports and documents; multiple business presentations. 4 lectures. Prerequisite: OCOB graduate standing or approval from the OCOB Associate Dean of Graduate Programs.

GSB X563 International Business Tour (4)

Business tour exposure to different management systems and their operating environments. Pre-trip and on-the-road meetings, readings, case studies and discussions. Tours of factories, multinational and local firms, government offices and ministries and port facilities; interviews of managers and government officials. Conducted in English; no prior international business or travel experience required. *Class Schedule* will list topic selected. 2 seminars, 2 activities. Prerequisite: OCOB graduate standing or approval from the OCOB Associate Dean of Graduate Programs.

HCS X415 Floral Design for Agricultural Educators (1)

Floral design practices, techniques and construction used in teaching floral design in a classroom setting. The designs and instruction required for orchestrating the designs in the State FFA Contest. 1 activity. Prerequisite: Credential candidate with teaching technique coursework, or consent of instructor.

HCS X575 Postharvest Instrumentation and Experimentation (3)

Hands-on instruction in the instrumentation available to conduct postharvest research, including discussions of the scientific method and typical postharvest studies. Required implementation and dissemination, both as a slide presentation and a poster, of a personalized postharvest experiment. 2 laboratories plus independent research outside of regularly-scheduled lab times. Prerequisite: STAT 218 or equivalent, and senior or graduate standing.

HIST X208 Survey of California History (4)

Survey of California history from the pre-Columbian period to the present. Native American culture, Spanish imperialism, the Mexican War, gold rush, immigration, dominance of the Southern Pacific Railroad, progressivism, growth of Los Angeles, and California's impact on national and world economy and politics. 4 lectures. ~~Prerequisite: Open to Liberal Studies majors only~~. (*Change effective Winter 2007.)*

HIST X210 World History I (5000 B.C.E. to 1789) (4) GE D3 *(effective Spring 2006)*

Global history from the beginnings of organized agriculture to the Industrial Revolution (5000 B.C.E. to 1789). Focus on causation, using geography and cultural creation to highlight economic, political, social, and intellectual developments of the major civilizations of Earth. 4 lectures. Prerequisite: Open to History and Liberal Studies majors only. *(Changes effective Spring 2006.)*

HIST X319 Modern South and Southeast Asia (4) GE D5

Modern histories of South and Southeast Asia: traditional empires and cultures, spread of modern capitalism, Western and Japanese colonialism, decolonization and independence, ethnic and religious tensions, roles in contemporary economy and geopolitics. 4 lectures. Prerequisite: Completion of GE Area A. Completion of two courses in lower-division Area D (preferably D2 and D3), or consent of instructor.

HIST X425 Social Sciences Teaching Practicum (1) (CR/NC)

Practicum for part-time and full-time student teachers in the social science credential program. Teaching techniques and strategies useful for addressing a wide range of issues that arise in 6-12 social science classrooms. Credit/No Credit grading only. 1 seminar. Prerequisite: HIST 424; corequisite: EDUC 469 or EDUC 479.

HIST X458 Gender and Sexuality in Modern Europe (4)

Social, economic, political, and cultural effects of changing gender systems in modern Europe, particularly but not exclusively with regard to sex and sexuality. 3 lectures and research project. Prerequisite: HIST 303, junior standing, or consent of instructor.

HNRS X324 The Historical Novel in the United States, 1960s to the Present (4)
(Also listed as HIST 324) GE D5

An introduction to the historical novel as it has developed in the United States since the 1960s. Exploration of how historical novels typically represent the past and the ways in which they change our notion of what counts as “history.” 4 lectures. Prerequisite: GE D1 and any other lower-division Area D course.

HNRS X380 Ecolit: Reading and Writing the Landscape (4) (Also listed as ENGL 380’s approved subtitle of same name) GE C4

Nature writing or ecoliterature, an ancient literary genre that has achieved new prominence among critics, teachers, writers and readers. A balance of humanities and science, art and nature, reading and writing, talking and walking. Great works of environmental literature and their traditions, the geography and ecology

of Cal Poly's ten thousand acres, and practical methods of observation and expression. 4 lectures. Prerequisite: Completion of GE Area A.

HUM X450 Summer Internship in London (12) (CR/NC)

Extensive work experience in a London placement. Administration, orientation, and supervision by the Foundation for International Education (FIE) in London. Must be able to do independent work in a career field in an international setting. Intensive two-week orientation course; eight-week full-time work assignment. Evaluation by course instructor, internship supervisor, and employer. Credit/No Credit grading only. 4 lectures, 8 supervision. Prerequisite: Junior standing or above; 2.6 GPA; and advisor approval.

IT X457 Radio Frequency Identification in Supply Chain Management (4)

Radio frequency identification (RFID) technology holds the promise to revolutionize supply chain management. Thorough overview of the technology from the managerial standpoint. Development of simple RFID solutions using a development kit. 2 lectures, 2 laboratories. Prerequisite: PHYS 121 or PHYS 122, MATH 141 or MATH 221.

IT X545 Product Conceptualization and Execution Using Rapid Prototyping (4)

Product development using current solid modeling and rapid prototyping technologies. Comprehensive simulation of the product development life cycle from initial concept to completed prototype. Applications of three-dimensional solid modeling and rapid prototyping to follow a product from conception to completion. 3 lectures, 1 laboratory. Prerequisite: Graduate standing or approval from the Associate Dean of OCOB Graduate programs.

JOUR X415 Advanced Public Relations Practice (4)

Application of public relations tools/techniques required to create, manage, and implement a comprehensive, professional public relations campaign. Research, planning, writing goals and objectives; establishing themes, strategies, and plan evaluations. Public relations crisis management. 4 lectures. Prerequisite: JOUR 413.

LS X213 Historical and Cultural Influences in the Development of Art, Science and Education (4)

Interconnectedness of the development of innovations in art, science and approaches to education in cultures ancient to modern. Focus on the intellectual contributions, artistic forms and traditions, including religious beliefs, as well as the evolution of artistic and scientific thought and its influence on educational systems from the medieval monasteries to contemporary universities. 4 lectures.

LS X214 The Constitution and American Educational Institutions (4)

Introduction to Bill of Rights and Constitution with focus on examination of significant legislation and American court cases that have affected public education from the colonial period to present. Overview of contributions of Franklin, Jefferson, Webster and other early figures. Landmark decision regarding discrimination, women's rights, religion, censorship, disabilities and student civil liberties. 4 lectures.

LS X475 Teaching Standards Based Art in the Elementary Classroom: A Distance Learning Course (1-5)

Distance learning course fulfilling content preparation for teaching candidates to meet state and national requirements to teach the arts in K-8. Development of lessons anchored on significant works of art which facilitate artistic perception, historical/cultural implications, aesthetic valuing, and creative skills. 1-5 lectures. Prerequisite: Two or more years of transferable college coursework. GE Area A requirements met.

MATE X130 Introduction to Materials Engineering Practice Design Laboratory III (1)

Third design laboratory in a sequence. Includes working in teams on project that benefits humanity. Issues of engineering ethics, technology and society, the environment and sustainability. 1 laboratory. Prerequisite: MATE 120.

MATE X222 Materials Selection for the Life Cycle (4)

Materials and product design, materials selection methodologies using current software, principles of green engineering, eco-design, and sustainability, life cycle analysis of engineered products using current software, ecological impact of materials and processes. Case studies used to illustrate concepts. 4 lectures. Prerequisite: ARCH 106 or MATE 210 of consent of instructor.

MATE X232 Nanotechnology, Human Biology, Ethics and Society (4)
(Also listed as BIO X232)

Focus on four nanotechnology examples as focal points for the themes of nanoscale science and technology, human biology, society, ethics, and systems thinking: gold nanoshells for cancer treatment; molecular manufacturing; tissue engineering for a vital organ; and a microfluidic glucose sensor. The focal points provide natural contexts for learning biology at the cellular level, the molecular level, the organ level and the biological systems level, respectively. 4 lectures. Prerequisite: GE Areas B1-B3.

MATE X322 Design Project Management (2) (CR/NC)

Project management of engineering designs. Development of leadership qualities. Credit/No Credit grading only. 1 seminar, 1 laboratory. Prerequisite: For Materials Engineering majors only. MATE 340, MATE 345.

MATE X424 Design of Educational Museum Displays for Materials Engineering (2)

Design and creation of interactive museum displays that highlight materials science and engineering. Projects done in teams and used in the SciTechatorium at the Santa Fe-Bellvue Elementary school in Avila. Educational presentations. 2 activities. Prerequisite: MATE 210 or consent of instructor.

MATE X510 Materials Analysis (4)

Fundamentals of materials surface analysis methods and thin-film microanalytical techniques, including scanning probe microscopy (SPM), auger emission spectroscopy (AES), x-ray photoelectron spectroscopy (XPS), secondary ion mass spectroscopy (SIMS), Raman and fourier transform infrared spectroscopy (FTIR). 4 lectures. Prerequisite: MATE 210, MATE 340, graduate standing or consent of instructor.

MATE X550 Micro Systems Design and Manufacture (4)

Fundamentals of intelligent systems employing sensors, actuators and intelligent controls. Impact on material properties as devices shrink in the micrometer realm. Applications toward exploring nanotechnology. 4 lectures. Prerequisite: MATE 210, MATE 340, graduate standing or consent of instructor.

MATE X555 Micro Systems Laboratory (2) (Also listed as ME X555)

Design, fabrication and testing of a microfluidic device. Utilization of a rapid prototype soft lithography processing technique to create micro channels, valves, mixing chambers, etc., for controlling fluid flow dynamics. 2 laboratories. Prerequisite: ME 341, MATE 430 or consent of instructor; corequisite: MATE X550 or consent of instructor.

MATH X425 Mathematics Student Teaching Seminar (1) (CR/NC)

Principles and practice in effective teaching of mathematics at the middle and high school level, learning theories, curriculum content and structure, classroom issues, and the teaching profession. Credit/No Credit grading only. Total credit limited to 2 units. 1 seminar. Prerequisite: Acceptance into Step II of the Single Subject Credential Program in Mathematics. Corequisite: Concurrent enrollment in EDUC 469 or EDUC 479.

MATH X504 Advanced Mathematical Topics for Teachers (1-4) (CR/NC)

Advanced mathematical topics for practicing credentialed teachers. Professional growth through improvement of teachers' mathematical content knowledge. Pedagogical approaches to the teaching of mathematics using technology, discussion, reflection, and hands-on activities. Content varies according to teaching level. *Class Schedule* will list topic selected. Total credit limited to 12 units. Credit/No Credit grading only. Not open to students in major or master's degree program in mathematics. 1-4 activities.

Prerequisite: Multiple Subject or Single Subject teaching credential or consent of instructor.

ME X540 Viscous Flow (4)

Review of tensor calculus and indicial notation. Development of Reynolds Transport Theory. Development of the equations of fluid motion from Lagrangian description. Special forms of the governing equations of fluid motion. Internal flows and other classic solutions to the Navier-Stokes Equations. Law of the Wall and turbulence. Advanced internal compressible flow. Surface waves. Prerequisite: ME 342 or ME X347, MATH 418, graduate standing or consent of instructor.

ME X555 Micro Systems Laboratory (2) (Also listed as MATE X555)

Design, fabrication and testing of a microfluidic device. Utilization of a rapid prototype soft lithography processing technique to create micro channels, valves, mixing chambers, etc., for controlling fluid flow dynamics. 2 laboratories. Prerequisite: ME 341, MATE 430 or consent of instructor; corequisite: MATE X550 or consent of instructor.

ME X565 Introduction to Spacecraft Structures and Mechanisms (4)

Introduction to spacecraft structures and mechanisms, including solid mechanics, dynamics and vibration, modal analysis and thermal effects. 4 lectures. Prerequisite: Graduate standing.

ME X579 Fluid Power Control (4)

Design, analysis, and control of fluid power systems. Steady-state analysis of valves, actuators, and transmissions. Dynamic modeling, response, stability, and control analysis via linear element representation and computer simulation. 3 lectures, 1 laboratory. Prerequisite: ME 422 or equivalent.

PE X181 Non-Traditional Sports – Lacrosse (1) (CR/NC)

Fundamental skills, rules and strategies used in playing Lacrosse. Credit/No Credit grading only. 1 activity.

PEM/PEW X195 Golf (2)

Practice time for members of NCAA Golf Team. 2 laboratories. Prerequisite: Approved member of team.

POLS X380 Religion and Politics in the Israeli-Palestinian Conflict (4)
(Also listed as RELS X380)

The Israeli-Palestinian conflict. Examination of the root causes of the conflict, its current manifestation, and possibilities for solutions from the perspective of religious studies and political science. 4 lectures. Prerequisite: POLS 225 or POLS 229, or RELS 309.

POLS X510 Research Design (4)

Exploration in policy research problem definition, framing hypotheses, literature review, sampling, measurement, and approaches to analysis. 4 lectures. Prerequisite: Graduate standing.

PSY X375 Forensic Psychology (4)

The application and practice of psychology in both the civil and criminal justice systems, with the following topics examined: police and investigative psychology, family forensic psychology, correctional psychology, expert witness testimony, and assessment techniques in forensic psychology. 4 lectures. Prerequisite: PSY 201 or PSY 202.

PSY X435 Psychopathology in Literature and Film (4)

Use of memoirs, novels, short-form fiction, and feature films to illustrate a variety of psychiatric disorders (e.g., psychotic, mood, anxiety, dissociative, somatoform, substance use, eating, and personality disorders). Weekly reaction papers and final exam determine grade. 3 lectures, 1 activity. Prerequisite: PSY 405.

PSY X472 Multicultural Psychology (4) USCP

The impact of culture, ethnicity, and race on human behavior within the framework of psychological theory and research. Emphasis on ethnic minority groups within the U.S., including: African Americans, Native Americans, Asian Americans/Pacific Islanders, and Latino/a Americans. 4 seminars. Prerequisite: PSY 201 or PSY 202 and junior/senior standing.

RELS X205 Jesus (4)

Exploration and analysis of the person of Jesus. Examination of our sources of knowledge about him, his self-understanding, and various interpretations of him in historical, comparative, and contemporary settings. 4 lectures.

RELS X374 Religion and Violence (4) GE C4

Historical and contemporary case studies of how various religions have condoned, motivated and justified violence. The place of sacrifice, martyrdom, self-injury and forced conversion in religious doctrines.

Representations of religious violence in the media. 4 lectures. Prerequisite: Completion of GE Area A and PHIL 230 or PHIL 231.

RELS X380 Religion and Politics in the Israeli-Palestinian Conflict (4)
(Also listed as POLS X380)

The Israeli-Palestinian conflict. Examination of the root causes of the conflict, its current manifestation, and possibilities for solutions from the perspective of religious studies and political science. 4 lectures. Prerequisite: POLS 225 or POLS 229, or RELS 309.

SCM X330 Ocean Discovery through Technology (4) GE Area F

Advances in technology are providing society with a new understanding of the ocean. Emphasis on the advances made in sensors and sensor platforms, such as ships, satellites, and underwater vehicles. An introduction to the marine science and current issues provides context for the course. 3 lectures, 1 activity. Prerequisite: Completion of GE Area B and junior standing.

SCM X335 Nuclear Science and Society (4) GE Area F

Scientific and public policy aspects of nuclear phenomena as represented in technology, warfare, health and medicine, and the environment. Topics include: nuclear proliferation, reactor design and safety, nuclear accidents, disposal of radioactive waste, nuclear medicine, food irradiation, and nuclear fusion. 4 lectures. Prerequisite: Junior standing, completion of GE Area B or consent of instructor.

SOC X450 Southeast Asian Economic Development (4)

Focus on poverty and economic development in Southeast Asian countries. The historical, political, and cultural differences among the Southeast Asian nations that lead to different outcomes for economic development and poverty reduction in these nations. Specific development and poverty reduction programs in the successful nations (primarily Thailand and Vietnam) that have led to rapid poverty reduction in these nations. Research papers required. 4 seminars. Prerequisite: Junior standing.

SPAN X302 Advanced Conversation and Composition in Spanish (4)

Formal discussion and writing of selected cultural ideas from the Spanish speaking world. Focus on individual and group presentations and in-class writing and speaking assignments that assist in acquiring more vocabulary and ability to use critical thinking skills in Spanish. Course taught in Spanish. 4 lectures. Prerequisite: SPAN 124 or equivalent.

STAT X320 Statistical Concepts and Methods for Mathematics and Statistics (4)

Introduction to statistical concepts and methods at post-calculus level. Observational studies, controlled experiments, scope of conclusions. Graphical, numerical summaries. Concepts, interpretations of significance tests, confidence intervals. Hypergeometric, binomial, and normal distributions. Use of MINITAB statistical package. 4 lectures. Prerequisite: MATH 142.

STAT X523 Design and Analysis of Experiments I (4)

Principles, construction and analysis of experimental designs. Completely randomized, randomized complete block, Latin squares, Graeco Latin squares, factorial, and nested designs. Fixed and random effects, expected mean squares, multiple comparisons, and analysis of covariance. 4 lectures. Prerequisite: STAT 513 or consent of instructor. Not available to students with credit for STAT 323.

UNIV X330 Cal Poly Land: Nature, Technology and Society (4)
(Also listed as AG/HUM 330) GE Area F

Scientific investigation of the natural features of the Cal Poly landscape and their transformations by land management technology. Analysis of the environmental, economic, social, and political effects of agricultural, resource extraction and construction technology on that landscape. Emphasis on the educational, land-use and long term planning issues of technology presented by this case study. 4 lectures. Prerequisite: Completion of GE Areas A and B, and junior standing.

UNIV X333 World Food Systems (4) GE Area F
(Also listed as POLS 333)

Integrated, interdisciplinary study of the technologies of global food production, environmental and social issues related to the application of those technologies, and moral and ethical issues associated with global food production and distribution. Emphasis on the politics of change. 4 lectures. Prerequisite: Junior standing and completion of GE Area B.

UNIV X339 Disaster-Resistant Sustainable Communities (4) GE Area F

Creation of safer, more resilient cities through systematic application of urban disaster risk reduction methods that utilize the technology of GIS combined with principles from the engineering and geo- sciences. Emphasis on hazard identification and methods to lower disaster risk. 3 lectures, 1 activity. Prerequisite: Completion of GE Area B and junior standing.

UNIV X350 The Global Environment (4) GE Area F
(Also listed as AG/BUS/EDES/HUM/SCM 350)

Interdisciplinary investigation of how human activities impact the Earth's environment on a global scale. Examination of population, resource use, climate change, and biodiversity from scientific/technical and

social/economic/historical/political perspectives. Use of remote sensing maps. Sustainable solutions. 3 lectures, 1 activity. Prerequisite: Completion of GE Areas A and B and junior standing.

UNIV X361 Modernism (4) GE C4 (Also listed as HUM 361)

Interdisciplinary survey of the eighteenth, nineteenth and twentieth-century concepts and cultural movements known as modernism throughout Europe, North America and Latin America. Disciplines may include architecture, art, drama, literature, music, philosophy and photography. 4 lectures. Prerequisite: Completion of GE Area A and one class from Area C.

WVIT X101 Orientation to Wine and Viticulture (1) (CR/NC)

Introduction to the wine and viticulture program. Emphasis on curriculum and career planning. Credit/No Credit grading only. 1 lecture.

WVIT X202 Enology I (4)

Introductory course in wine making designed for all Wine and Viticulture majors. Introductions to equipment, fermentation chemistry, winery management and the relationship between grape growing and wine making. Prerequisite: WVIT 101, CHEM 111.

WVIT X339 Internship in Wine and Viticulture (1-12) (CR/NC)

One or two quarters spent with an approved wine industry employer engaged in wine production or related agribusiness and viticulture activities. Applying and developing production and managerial skills and abilities. One unit of credit may be allowed for each full week of completed and reported internship. Degree credit limited to 6 units. Credit/No Credit grading only. Prerequisite: WVIT 202, FRSC 231, junior standing, and consent of internship instructor.

WVIT X404 Enology II (4)

Understanding and assessment of the key chemical, sensory and processing considerations important to premium commercial wine production. 3 lectures, 1 laboratory. Prerequisite: WVIT 202, FSN 464.

NEW COURSES Approved after printing of the 2005-07 Catalog

Updated 1/26/07

AG 200 Special Problems for Undergraduates (1-2) (CR/NC)

Individual investigation, research, studies, or surveys of selected problems. Total credit limited to 4 units, with a maximum of 2 units per quarter. Credit can only be used to satisfy free electives. Credit/No Credit grading only. Prerequisite: Consent of rodeo coach/instructor.

AG 400 Special Problems for Advanced Undergraduates (1-2) (CR/NC)

Individual investigation, research, studies, or surveys of selected problems. Total credit limited to 4 units, with a maximum of 2 units per quarter. Credit/No Credit grading only. Prerequisite: Consent of rodeo coach/instructor.

AGED 422 Organizing and Teaching K-6 Standards (4)

Objectives, content, techniques, materials, and recent trends of successful application of agricultural literacy and awareness to K-6 grade level standards. Ongoing projects, individual and group, allow for exploration and understanding of agriculture as a theme to teach all of the content areas, as well as assist in understanding the educational standards accompanying each lesson. 4 lectures. Prerequisite: Liberal Studies Preservice candidate.

ASTR 200 Special Problems for Undergraduates (1-2)

Individual investigation, research, studies, or surveys of selected problems. Total credit limited to 4 units, with a maximum of 2 units per quarter. Prerequisite: Consent of department chair.

ASTR 400 Special Problems for Advanced Undergraduates (1-2)

Individual investigation, research, studies, or surveys of selected problems. Total credit limited to 4 units, with a maximum of 2 units per quarter. Prerequisite: Consent of department chair.

BMED 111 Biomedical Engineering Calculations (3)

General introduction to bioengineering application of basic engineering science applied to topics in biomechanics, bioinstrumentation, biomaterials, biotechnology, and related areas. Application of the concepts

and methods of science, mathematics and engineering to problems in biomedical engineering. 3 lectures. Corequisite: MATH 142 or consent of instructor.

BMED 212 Introduction to Biomedical Engineering Design (3)

General introduction to bioengineering design, including examples of engineering analysis and design applied to representative topics in biomechanics, bioinstrumentation, biomaterials, biotechnology, and related areas. Review of technological needs, design methodology, testing procedures, statistical analysis, governmental regulation, evaluation of costs and benefits, quality of life, and ethical issues. 2 lectures, 1 laboratory. Prerequisite: MATH 143 or consent of instructor.

BMED 310 Biomedical Engineering Management and Analysis (4)

Fundamentals of biomedical engineering analysis. Use and application of tools and analytical methods used by bioengineers. 3 lectures, 1 laboratory. Prerequisite: ME 211 or consent of instructor.

BMED 410 Biomechanics (4)

Introduction to physiological systems, with emphasis on structure and function of major tissues and organs. Application of mechanics to understand the behavior of these tissues and organs at gross and microscopic levels. Bioelastic solids. Rigid body biomechanics. Biofluids, basic mechanical properties of collagen and elastin, bone, cartilage, muscles, blood vessels, and other living tissues. Application of continuum mechanics to hard and soft tissues. Biomechanical engineering design for clinical applications. 3 lectures, 1 laboratory. Prerequisite: ME 212, BMED 310 or consent of instructor.

BMED 420 Principles of Biomaterials Design (4)

Fundamentals of materials science as applied to bioengineering design. Natural and synthetic polymeric materials. Materials characterization and design. Wound repair, blood clotting, foreign body response, transplantation biology, biocompatibility of materials, tissue engineering. Artificial organs and medical devices. Government regulations. Patenting. Ethical issues. 2 lectures, 2 laboratories. Prerequisite: ME 212, BMED 310 or consent of instructor.

BMED 425 Biomedical Engineering Transport (4)

Mass transfer in solids, liquids, and gases with application to biological systems. Free and facilitated diffusion. Convective mass transfer. Diffusion-reaction phenomena. Active transport. Biological mass transfer coefficients. Nonequilibrium thermodynamic analysis of transport phenomena. The osmotic effect. Diffusion and exchange in biological systems. 4 lectures. Prerequisite: ME 302, BMED 310 or consent of instructor.

BMED 430 Biomedical Modeling and Simulation (4)

Finite element methods for anatomical modeling and boundary value problems in the biomechanics of tissues and biomedical devices. Nonlinear biodynamics, heat flow, cardiac impulse propagation, anatomic modeling, and biomechanics. 2 lectures, 2 laboratories. Prerequisite: BMED 420 or consent of instructor.

BMED 440 Bioelectronics and Instrumentation (4)

Analog and digital circuits in bioinstrumentation. Biomedical signals in continuous and discrete systems. Sampling and digital signal processing. Ultrasound, MRI, CT, Bioelectromagnetics. Electrokinetics. Biophysical phenomena, transducers, and electronics as related to the design of biomedical instrumentation. Potentiometric and amperometric signals and amplifiers. Biopotentials, membrane potentials, chemical sensors. Mechanical transducers for displacement, force and pressure. Temperature sensors. Flow sensors. Light-based instrumentation. Electrical safety. 3 lectures, 1 laboratory. Prerequisite: EE 201, BMED 310 or consent of instructor.

BMED 450 Contemporary Issues in Biomedical Engineering (4)

Current and evolving topics in biomedical engineering, including medical and industrial applications. Exploration of contemporary issues in biomedical engineering, including technical and societal implications. *Class Schedule* will list topics selected. Total credit limited to ~~four~~ 16 units. 4 lectures. Prerequisite: Senior standing in Biomedical Engineering. *Change effective Winter 2007.*

BMED 455, 456 Bioengineering Design I, II (4) (4)

Preparation of formal engineering reports on a series of engineering analysis and design problems illustrating methodology from various branches of applied mechanics as applied to bioengineering problems. Statistical analysis. Governmental regulations. Bioethical issues. 2 lectures, 2 laboratories. Prerequisite: ME 341, BMED 410 or consent of instructor.

BMED 460 Engineering Physiology (4)

Physiology for biomedical engineering students, with an emphasis on control mechanisms and engineering principles. Engineering aspects of basic cell functions; biological control systems; muscle; neural; endocrine, and circulatory systems, digestive, respiratory, renal, and reproductive systems; regulation of metabolism, and defense mechanisms. 3 lectures, 1 laboratory. Prerequisite: ZOO 331 or equivalent, BMED 310 or consent of instructor.

ES 241 Survey of Indigenous Studies (4) GE D3 USCP

A survey of the interdisciplinary field of indigenous studies and specifically the social, political, economic, legal, and cultural institutions of American Indian, Native Alaskan, and Native Hawaiian peoples within a transnational and global context. Special attention paid to the interlocking systems of race, class, gender, and sexuality, particularly within but not limited to the United States. 4 lectures. *(Valid Fall 2006)*

ES 242 Survey of Africana Studies (4) GE D3 USCP

A survey of the interdisciplinary field of Africana Studies and specifically the social, political, economic, legal, and cultural institutions of African American, Afro-Caribbean, and African diasporic peoples within a transnational and global context. Special attention paid to the interlocking systems of race, class, gender, and sexuality, particularly within but not limited to the United States. 4 lectures. *(Valid Fall 2006)*

ES 243 Survey of Latino/a Studies (4) GE D3 USCP

A survey of the interdisciplinary field of Latino/a Studies and specifically the social, political, economic, legal, and cultural institutions of Chicano/a and other Latino/a peoples within a transnational and global context. Special attention paid to the interlocking systems of race, class, gender, and sexuality, particularly within but not limited to the United States. 4 lectures. *(Valid Fall 2006)*

ES 244 Survey of Asian American Studies (4) GE D3 USCP

A survey of the interdisciplinary field of Asian American Studies and specifically the social, political, economic, legal, and cultural institutions of West Asian, South Asian, Southeast Asian, and East Asian peoples in the United States within a transnational and global context. Special attention paid to the interlocking systems of race, class, gender, and sexuality, particularly within but not limited to the United States. 4 lectures. *(Valid Fall 2006)*

ES 310 Hip-Hop, Poetics and Politics (4) GE D5 USCP

Dynamics of hip-hop culture, its historical development, political significance, and social influence. How hip-hop exemplifies cross-cultural hybridization within not only Black communities nationally and internationally, but also amongst indigenous, Latino/a, and Asian peoples in the U.S. and beyond. 4 lectures. Prerequisite: Completion of GE Area A and two courses from D1, D2, D3 or D4. *(Valid Fall 2006)*

ES 381 The Social Construction of Whiteness (4) GE D5 USCP

The investigation of the social construction of race in the United States through historicizing the category of "whiteness." Why "white" was invented as a racial category and how white privilege has been sustained through social, political, economic and legal practices. 4 lectures. Prerequisite: Completion of GE Area A and two courses from D1, D2, D3 or D4. *(Valid Fall 2006)*

ES 390 Research Methodology in Comparative Ethnic Studies (4)

Theory and practice of research methodology in comparative ethnic studies. Topics include the scientific method, qualitative and quantitative methodologies, and ethical practices. Research report prepared from start to finish, including database searching, collecting pilot data, and proper formatting of a research report. Issues of race in research practice and use foregrounded throughout. 3 lectures, 1 activity. Prerequisite: Completion of Area A, STAT 217, ES 112 and three courses from ES 241, ES 242, ES 243, ES 244. Junior standing. *(Valid Fall 2006)*

ES 410 Advanced Topics in Comparative Ethnic Studies (4)

Selected topics and issues in comparative ethnic studies. *Class Schedule* will list topic selected. Repeatable for a maximum of 8 units. 4 seminars. Prerequisite: ES 390 or consent of instructor. *(Valid Fall 2006)*

ES 450 Fieldwork in Comparative Ethnic Studies (4)

Supervised project based on fieldwork in comparative ethnic studies. 4 seminars. Prerequisite: ES 390 or consent of instructor. *(Valid Fall 2006)*

ES 461 Senior Project (4)

Completion of a project under faculty supervision. Results presented in a formal paper or project. Prerequisite: ES 390 and departmental approval. *(Valid Fall 2006)*

HNRS 230 Philosophical Classics: Metaphysics and Epistemology (4)
(Also listed as PHIL 230) GE C2

Study of several classic works from the history of philosophy on issues in metaphysics and epistemology. At least one will be from the Ancient period, and at least one from the Modern era. No more than one from the twentieth century. 4 lectures. Prerequisite: Completion of GE Area A.

BMED-BIOMEDICAL ENGINEERING – 2005-07 Catalog

Biomedical and General Engineering Department

Courses begin Fall 2006

BMED 111 Biomedical Engineering Calculations (3)

General introduction to bioengineering application of basic engineering science applied to topics in biomechanics, bioinstrumentation, biomaterials, biotechnology, and related areas. Application of the concepts and methods of science, mathematics and engineering to problems in biomedical engineering. 3 lectures. Corequisite: MATH 142 or consent of instructor.

BMED 212 Introduction to Biomedical Engineering Design (3)

General introduction to bioengineering design, including examples of engineering analysis and design applied to representative topics in biomechanics, bioinstrumentation, biomaterials, biotechnology, and related areas. Review of technological needs, design methodology, testing procedures, statistical analysis, governmental regulation, evaluation of costs and benefits, quality of life, and ethical issues. 2 lectures, 1 laboratory. Prerequisite: MATH 143 or consent of instructor.

BMED 310 Biomedical Engineering Management and Analysis (4)

Fundamentals of biomedical engineering analysis. Use and application of tools and analytical methods used by bioengineers. 3 lectures, 1 laboratory. Prerequisite: ME 211 or consent of instructor.

BMED 410 Biomechanics (4)

Introduction to physiological systems, with emphasis on structure and function of major tissues and organs. Application of mechanics to understand the behavior of these tissues and organs at gross and microscopic levels. Bioelastic solids. Rigid body biomechanics. Biofluids, basic mechanical properties of collagen and elastin, bone, cartilage, muscles, blood vessels, and other living tissues. Application of continuum mechanics to hard and soft tissues. Biomechanical engineering design for clinical applications. 3 lectures, 1 laboratory. Prerequisite: ME 212, BMED 310 or consent of instructor.

BMED 420 Principles of Biomaterials Design (4)

Fundamentals of materials science as applied to bioengineering design. Natural and synthetic polymeric materials. Materials characterization and design. Wound repair, blood clotting, foreign body response, transplantation biology, biocompatibility of materials, tissue engineering. Artificial organs and medical devices. Government regulations. Patenting. Ethical issues. 2 lectures, 2 laboratories. Prerequisite: ME 212, BMED 310 or consent of instructor.

BMED 425 Biomedical Engineering Transport (4)

Mass transfer in solids, liquids, and gases with application to biological systems. Free and facilitated diffusion. Convective mass transfer. Diffusion-reaction phenomena. Active transport. Biological mass transfer coefficients. Nonequilibrium thermodynamic analysis of transport phenomena. The osmotic effect. Diffusion and exchange in biological systems. 4 lectures. Prerequisite: ME 302, BMED 310 or consent of instructor.

BMED 430 Biomedical Modeling and Simulation (4)

Finite element methods for anatomical modeling and boundary value problems in the biomechanics of tissues and biomedical devices. Nonlinear biodynamics, heat flow, cardiac impulse propagation, anatomic modeling, and biomechanics. 2 lectures, 2 laboratories. Prerequisite: BMED 420 or consent of instructor.

BMED 440 Bioelectronics and Instrumentation (4)

Analog and digital circuits in bioinstrumentation. Biomedical signals in continuous and discrete systems. Sampling and digital signal processing. Ultrasound, MRI, CT, Bioelectromagnetics. Electrokinetics. Biophysical phenomena, transducers, and electronics as related to the design of biomedical instrumentation. Potentiometric and amperometric signals and amplifiers. Biopotentials, membrane potentials, chemical sensors. Mechanical transducers for displacement, force and pressure. Temperature sensors. Flow sensors.

Light-based instrumentation. Electrical safety. 3 lectures, 1 laboratory. Prerequisite: EE 201, BMED 310 or consent of instructor.

BMED 450 Contemporary Issues in Biomedical Engineering (4)

Current and evolving topics in biomedical engineering, including medical and industrial applications. Exploration of contemporary issues in biomedical engineering, including technical and societal implications. *Class Schedule* will list topics selected. Total credit limited to ~~four~~ 16 units. 4 lectures. Prerequisite: Senior standing in Biomedical Engineering. *Change effective Winter 2007.*

BMED 455, 456 Bioengineering Design I, II (4) (4)

Preparation of formal engineering reports on a series of engineering analysis and design problems illustrating methodology from various branches of applied mechanics as applied to bioengineering problems. Statistical analysis. Governmental regulations. Bioethical issues. 2 lectures, 2 laboratories. Prerequisite: ME 341, BMED 410 or consent of instructor.

BMED 460 Engineering Physiology (4)

Physiology for biomedical engineering students, with an emphasis on control mechanisms and engineering principles. Engineering aspects of basic cell functions; biological control systems; muscle; neural; endocrine, and circulatory systems, digestive, respiratory, renal, and reproductive systems; regulation of metabolism, and defense mechanisms. 3 lectures, 1 laboratory. Prerequisite: ZOO 331 or equivalent, BMED 310 or consent of instructor.

BA COMPARATIVE ETHNIC STUDIES – 2005-07 Catalog

Ethnic Studies Department
Math and Science Bldg. (38) Room 136
805 756-1707

Approved effective Fall 2006

- *60 units upper division*
- *2.0 GPA*
- *GWR*
- *USCP*

** = Satisfies General Education requirement*

MAJOR COURSES

ES 112 Race, Culture and Politics in the United States (D1)* (USCP)	4
Choose any 3 courses (D3)*(USCP)	12
ES 241 Survey of Indigenous Studies (4)	
ES 242 Survey of Africana Studies (4)	
ES 243 Survey of Latino/a Studies (4)	
ES 244 Survey of Asian American Studies (4)	
ES 350 Gender, Race, Science & Technology (USCP)	4
ES 390 Research Methodology in Comparative Ethnic Studies	4
ES 410 Advanced Topics in Comparative Ethnic Studies	4
ES 450 Fieldwork in Comparative Ethnic Studies	4
ES 461 Senior Project	4
Advisor Approved Electives	40
(Minimum 20 elective units must be 300-400 level.) Minimum 20 units must be from courses offered by the Ethnic Studies Department. The remaining elective courses can be chosen from Ethnic Studies-related courses offered by other departments. (See an Ethnic Studies advisor for a list of qualifying courses.)	
	76

SUPPORT COURSES

Language other than English (*all 8 units must be in the same language*)	8
STAT 217 Introduction to Statistical Concepts and Methods (B1)*	4
	12

GENERAL EDUCATION (GE)

72 units required; 12 units are in Major/Support.

®Minimum of 12 units required at the 300-400 level.

Area A Communication (12 units)	
A1 Expository Writing	4
A2 Oral Communication	4
A3 Reasoning, Argumentation, and Writing	4
Area B Science and Mathematics (16 units)	
B1 Mathematics/Statistics * 4 units in Support	4
B2 Life Science	4
B3 Physical Science	4
B4 One lab taken with either a B2 or B3 course	
B5 elective	
Area B elective (select one course from B1-B5)	4

Area C Arts and Humanities (16 units)	
C1 Literature	4
C2 Philosophy	4
C3 Fine/Performing Arts	4
C4 Upper-division elective (not ES courses)	4
Area D/E Society and the Individual (12 units)	
D1 The American Experience (40404) *4 units in Major	0
D2 Political Economy	4
D3 Comparative Social Institutions *4 units in Major	0
D4 Self Development (CSU Area E)	4
D5 Upper-division elective (not ES courses)	4
Area F Technology Elective (upper division) (4 units)	4
	60
ELECTIVES	**32**
(minimum 8 units must be 300-400 level)	
	180

MS AEROSPACE ENGINEERING – 2005-07 Catalog

Aerospace Engineering Department
Engineering III Bldg. (40A), Room 134
(805) 756-2562
FAX: (805) 756-2376

Revisions Effective Fall 2006

General Characteristics. The Master of Science program in Aerospace Engineering prepares the student for entry into a well-established field of aerospace engineering. Two versions of the master's program are available.

- **Research Specialization.** Emphasizes engineering science and research activity. Graduates have an increased capability for complex research, development, and innovative design, and are prepared for further study in engineering, leading to the Doctor of Engineering or Ph.D. The subject matter relative to flight simulation and controls, structures, propulsion, and aerothermal sciences has been integrated into course work. A thesis is required.

- **Space Systems Engineering Specialization.** Is a more focused version of the MS Aerospace Engineering with a smaller number of electives and a clear space systems and systems engineering emphasis. It is designed to accommodate students with undergraduate degrees in science or engineering disciplines other than aerospace engineering. Students in this specialization develop an understanding of all subsystems in a space vehicle (spacecraft or missile/launch vehicle) and how they are combined to form a complete space vehicle. The program also presents the basic principles of systems engineering and their application to space vehicle design.

Prerequisites. For admission as a classified graduate student, an applicant must hold a bachelor's degree in engineering or a closely related physical science with a minimum grade point average of 3.0 in the last 90 quarter units (60 semester units) attempted. Applicants are required to submit satisfactory scores for the General (Aptitude) Test of the Graduate Record Examination.

An applicant who meets these standards but lacks prerequisite coursework may be admitted as a conditionally classified student and must make up any deficiencies before advancement to classified graduate standing. Information pertaining to specific requirements for admission to graduate standing (classified or conditionally classified) may be obtained from the Graduate Coordinator, Department of Aerospace Engineering.

Program of Study. Graduate students must file a formal study plan with their advisor, department, college and graduate studies office by no later than the end of the quarter in which the 12th unit of approved courses is completed. The formal program of study must include a minimum of 45 units (at least 24 of which must be at the 500 level). A thesis or project is required as a culminating experience. Course work includes core electives in specific areas of interest to aerospace engineering as well as a number of advisor approved electives in the student's area of interest.

Core Areas

Select from the following courses or advisor approved elective(s):

- Stability and Control
  AERO 519, 550, 551, 555, 560
- Structures
  AERO 534, 535, 532
- Propulsion
  AERO 540, 541
- Aerodynamics/Fluid Dynamics
  AERO 520, 521, 522, 523, 525

· Engineering Fundamentals
AERO 515

· Space Electronics and Electrical Systems
EE 519, 526, 528, 533

MS Aerospace Engineering, Specialization in RESEARCH

Core Area requirements	16
Select 4 of the following core areas:	
Stability and Control (4)	
Structures (4)	
Propulsion (4)	
Aerodynamics/Fluid Dynamics (4)	
Engineering Fundamentals (4)	
Mathematics courses	8
MATH 501 Applied Mathematics I (4)	
Math or numerical methods elective (4)	
Advisor approved electives	12
Culminating experience	9
AERO 599 Thesis (Design Project) (2) (2) (5)	
	45

MS Aerospace Engineering, Specialization in SPACE SYSTEMS ENGINEERING

Core Area requirements	12
Select 3 of the following core areas:	
Stability and Control (4)	
Structures (4)	
Propulsion (4)	
Space Electronics and Electrical Systems (4)	
Systems Engineering courses	12
AERO 450 Intro Aerospace Systems Engineering (4)	
AERO 510 Aerospace Systems Engineering I (4)	
AERO 511 Aerospace Systems Engineering II (4)	
Space Systems courses	12
AERO 446 Intro Space Systems (4)	
AERO 512 Aerospace Vehicle Software App (4)	
AERO 566 Adv Spacecraft Design (4) *or* AERO 567 Launch Vehicle & Missile Des (4)	
Space Systems lab courses	4
AERO 561 Vehicle Integration and Testing (2)	
AERO 562 Space Operations (2)	
Culminating experience	5
AERO 599 Thesis (Design Project) (5)	
	45

EDUC-EDUCATION – 2005-07 Catalog

College of Education

EDUC 125 Efficient Reading (2) (CR/NC)

Development of reading efficiency required in modern business, industry, and the professions, as well as study skills in subject matter content areas. Total credit limited to 4 units. Credit/No Credit grading only. 1 lecture, 1 activity.

EDUC 207 Introduction to the Learner's Development, Culture, Language, and Identity (5) (Also listed as CD 207)

Theoretical background of child development for teaching-learning in all aspects of development that influence the teaching-learning process. Special emphasis on multicultural, language, and other diversity issues. Introduction to Multiple Subject Credential Program, and Program Portfolio. Fieldwork activities and other settings. 4 lectures, 1 activity. Prerequisite: PSY 201 or PSY 202.

EDUC 300 Introduction to the Teaching Profession (3) (CR/NC)

Supervised observation and participation in cooperating public schools. A minimum of forty-five hours of observation and participation. Discussion focuses on instructional practice and subject matter taught in grades observed, as well as the historical, philosophical, and social foundation of American public education. Total credit limited to 6 units. Credit/No Credit grading only. 2 lectures, 1 activity. Prerequisite: Junior standing or consent of instructor.

EDUC 304 Orientation to the Teaching of Students with Disabilities (2) (CR/NC)

Introduction to the Education Specialist Credential and role of special education in the public school. Required first course in program. Orientation to program and study of self and others, laws and current conditions of special education. Required field observations and activities. 1 seminar, 1 activity. Credit/No Credit grading only. Prerequisite: Acceptance into Level I Special Education Credential Program, and must have fulfilled early field experience requirement.

EDUC 310 Effective Teaching and Classroom Management with a Multicultural Perspective in K-3 and 4-8 Settings (4)

Knowledge, theory, fieldwork and research related to effectively managing, planning, and teaching in K-3 and 4-8 classrooms; connections between preventing discipline problems and choices about curriculum, instruction, and management; creating a positive learning environment for all students. 2 seminars, 2 activities. Prerequisite: LS 230.

EDUC 400 Special Problems for Undergraduates (1–4)

Individual investigation, research, studies or surveys of selected problems. Total credit limited to 8 units, with a maximum of 4 units per quarter. Prerequisite: Junior standing and consent of instructor.

EDUC 412 Schooling in a Democratic Society (4) (CR/NC)

The role and aims of public education for culturally diverse learners. Credit/No Credit grading only. 2 lectures, ~~1 laboratory, 1 activity~~ 2 activities. Prerequisite: Admission to the Single Subject Program or senior standing for Agricultural Education candidates. Concurrent: EDUC 414 and EDUC 416 and content methods course (except students enrolled in Agricultural Education Credential Program). *Change effective Fall 2006.*

EDUC 414 Curriculum and Organization in Secondary Schools (4) (CR/NC)

Principles, methods and practices of organizing and managing secondary schools and classrooms including multiple models of classroom discipline as related to adolescent development, classroom routines, learning environments, introduction to legal requirements for educating English language learners (ELL) and special needs students, and backward design curriculum development and assessment. Site visits to local schools to allow analysis of routines and policies of local schools. Credit/No Credit grading only. 2 lectures, ~~1 laboratory, 1 activity~~ 2 activities. Prerequisite: Admission to the Single Subject Credential Program or senior standing for Agricultural Education candidates. Concurrent: EDUC 412 and EDUC 416 and content methods

course (except students enrolled in Agricultural Education Credential Program). *Change effective Fall 2006.*

EDUC 416 Literacy and Learning in Secondary Schools (4) (CR/NC)

Theories of literacy, learning, assessment and second language acquisition. Observing classrooms, tutoring English language learners, and designing instructional lessons and assessments to address learners' needs across content areas. Developing theories of learning consistent with content teaching standards. Credit/No Credit grading only. 2 lectures, ~~1 laboratory, 1 activity~~ 2 activities. Prerequisite: Admission to the Single Subject Credential Program or senior standing for Agricultural Education candidates. Concurrent: EDUC 412 and EDUC 414 and content methods course (except students enrolled in Agricultural Education Credential Program). *Change effective Fall 2006.*

EDUC 418 Advanced Topics in Teaching and Learning (4) (CR/NC)

Differentiated instruction and further theoretical knowledge and skills needed for successful teaching of linguistically and culturally diverse learners. Credit/No Credit grading only. 2 lectures, 2 activities. Prerequisite: EDUC 412, EDUC 414, EDUC 416 and content methods course. Concurrent: EDUC 420 and EDUC 469, or AGED 438 for students enrolled in Agricultural Education Credential Program.

EDUC 420 Professional Development and Collaboration (4) (CR/NC)

Further development in the areas of assessment and teaching special needs students. Knowledge and skills needed for successful collaboration with other education professionals. Credit/No Credit grading only. 2 lectures, 2 activities. Prerequisite: EDUC 412, EDUC 414, EDUC 416 and content methods course. Concurrent: EDUC 418 and EDUC 469 (except students enrolled in Agricultural Education Credential Program).

EDUC 423 Bilingual Literacy (4)

Patterns of classroom organization, application of reading programs, approaches, methods in English and Spanish, and supervised field experiences in elementary classrooms with bilingual students. 3 seminars, 1 activity. Limited to students seeking BCLAD certification. Prerequisite: Junior status, Spanish proficiency and/or consent of instructor.

EDUC 427 Theories, Methods, and Assessment for First and Second Language Acquisition in Secondary Schools (3)

Theories, methods, materials and assessment involved in the instruction of limited English proficient (L.E.P.) students. Bilingual, transitional, and English only programs compared across a historical framework. An integrated language arts approach emphasized, including application of reading programs based on theories of language acquisition. 2 seminars, 1 activity. Prerequisite: Admission to single subject teaching credential program or junior standing in agricultural education major. *(Course reinstated, with modifications, effective Spring 2006)*

EDUC 428 Teaching K-3 Reading, Language Arts, and Children's Literature with a Multicultural Perspective (4)

Knowledge and skills for planning, teaching, and evaluating in a balanced, comprehensive, research-based primary (K-3) language arts program, with fieldwork, to ensure children of all abilities and backgrounds success as citizens who read, write, speak, listen and think effectively. 2 seminars, 2 activities. Prerequisite: Must be admitted into the Multiple Subject Credential Program (STEP I or STEP A).

EDUC 429 Teaching 4-8 Grade Reading, Language Arts, and Children's Literature with a Multicultural Perspective (4)

Knowledge and skills for planning, teaching, and evaluating in a balanced, comprehensive, research-based 4-8 grade language arts program, with fieldwork, to ensure children of all abilities and backgrounds success as citizens who read, write, speak, listen and think effectively. 2 seminars, 2 activities. Prerequisite: Must meet all requirements for acceptance into the Multiple Subject Credential Program and EDUC 428.

EDUC 430 Teaching Reading and Language Arts with a Multicultural Perspective (6)

Development of knowledge and skills for planning, implementing, and evaluating the teaching of a balanced,

comprehensive, research-based reading and language arts program in grades K-8 with attention to children of all abilities and backgrounds. State and national trends. Language development. 4 seminars, 2 activities. Prerequisite: Must meet all requirements for admission into the Multiple Subject Credential Program and ENGL 391, ENGL 390, or ENGL 290, and EDUC 310, EDUC/CD 207, and application for Multiple Subject Credential Program.

EDUC 431 Teaching Social Science and the Arts with a Multicultural Perspective (4)

Development of knowledge and skills related to planning, implementing and evaluating integrated social science units of instruction; effects of culture on the selection and implementation of curriculum; knowledge and integration of physical education, art, and music. 2 seminars, 2 activities. Prerequisite: Must be admitted into the Multiple Subject Credential Program (STEP I or STEP A).

EDUC 432 Teaching Science and Mathematics with a Multicultural Perspective (4)

Curriculum and methods in teaching science and mathematics. Selecting, organizing, presenting science and mathematics lessons at the appropriate level throughout the curriculum. Emphasis on thinking processes, manipulative and process skills within the context of the curriculum frameworks. 2 seminars, 2 activities. Prerequisite: Admission to STEP II or STEP B of the Multiple Subject Credential Program. Taken concurrently with Student Teaching I (EDUC 434 or EDUC 454).

EDUC 433 Bilingual Foundations (2)

Limited to students seeking BCLAD Certification. Theories, methods, and techniques in bilingual education. 2 seminars. Prerequisite: Spanish proficiency, junior status and/or consent of instructor. Repeatable to 4 units. *Change effective Fall 2006.*

EDUC 434 Student Teaching – Multiple Subject Credential (10) (CR/NC)

Field assignment involving observation, teaching, research and related activities in public elementary and middle school classrooms. Credit/No Credit grading only. Concurrent: EDUC 455. Prerequisite: EDUC 430 and EDUC 431, and admission to STEP II or STEP B of the Multiple Subject Credential Program.

EDUC 440 Educating Individuals with Exceptional Needs (4)

Characteristics, incidence, and etiology of individuals with exceptional needs. Problems, assessment, and approaches toward accommodating students with exceptional needs in the regular classroom. 4 seminars. Prerequisite: Any course in GE Area D4, EDUC 300, EDUC 301 or EDUC 305.

EDUC 441 Education Specialist Level II Induction Seminar (2) (CR/NC)

Orientation class to develop a two (minimum) to five (maximum) year plan that will result in a Professional Clear Education Specialist Credential. Plan to contain elements that extend the learning of the Level I credential, foster critical reflection, include involvement of employer (i.e., school district) representatives, and include both university and non-university academic work. Credit/No Credit grading only. 1 seminar, 1 activity. Prerequisite: Admission into Level II Special Education Credential Program.

EDUC 442 Elementary Field Experience in General and Special Education (2-4) (CR/NC)

Public school classroom experiences in both general education classrooms and special education classrooms at the elementary level. Teaching individuals and small groups, emphasis on reading skills. Minimum 20 hours per week. Total credit limited to 8 units. Credit/No Credit grading only. Prerequisite: Acceptance into Level I Special Education Credential Program, EDUC 304, EDUC 440. Must be taken concurrently with EDUC 451.

EDUC 443 Assessment of Level II Education Specialists (2) (CR/NC)

Use of multifaceted assessment process to verify that candidates have met the Level II Performance standards, including portfolio review, coursework competency review, and oral presentation before an assessor panel composed of trained professional practitioners. Credit/No Credit grading only. 1 seminar, 1 activity. Prerequisite: Admission into the Professional Level II Special Education Credential Program and completion of all Level II coursework and related activities.

EDUC 444 The Atypical Infant (4) (Also listed as PSY 444)

Exploration of issues pertinent to the development of atypical infants. Relationship of theory and research to intervention efforts with handicapped, developmentally delayed infants, and other at-risk infants. 3 seminars, 1 activity. Prerequisite: Junior standing, PSY 256 or CD 209, and EDUC 440 or consent of instructor.

EDUC 445 Reading/Language Arts Instruction for Special Educators (4)

Diagnosis and remediation of reading problems. Review of reading programs. General education (K-12) reading instructions. Alternative methods of developing English language reading skills. Field activities required. 3 seminars, 1 activity. Prerequisite: Acceptance into Level I Special Education Credential Program, EDUC 440, EDUC 446.

EDUC 446 Special Education and Instruction in the K-12 Curriculum (4)

For Level I Special Education Credential candidates. Curriculum and method in teaching science, social science, mathematics, reading and the arts at the elementary schools including scope and sequence and appropriate methods for English language learners. The learning environment in the middle, junior high school, and secondary school with emphasis on specific single subject teaching area. 3 seminars, 1 activity. Prerequisite: Acceptance into Level I Special Education Credential Program, EDUC 440.

EDUC 447 Secondary Field Experience in General and Special Education (2-4) (CR/NC)

Public school classroom experiences in both general education classrooms and special education classrooms at the secondary level. Teaching individuals and small groups, emphasis on behavior management. Minimum 20 hours per week. Total credit limited to 8 units. Credit/No Credit grading only. Prerequisite: Acceptance into Level I Special Education Credential Program, EDUC 440. Must be taken concurrently with EDUC 451.

EDUC 449 Special Education Student Teaching (4) (CR/NC)

Participation in public schools as a student teacher in activities representing different roles of special education teachers. Assumption of a teacher's responsibility for individual and small groups. Minimum 20 hours per week. Total credit limited to 8 units. Credit/No Credit grading only. Prerequisite: Acceptance into Level I Special Education Credential Program, EDUC 440, EDUC 442, EDUC 446, EDUC 447 and completion of all program requirements. Must be taken concurrently with EDUC 451.

EDUC 450 Behavior Disorders and Positive Behavior Support Strategies ~~(4)~~ (5)

Assessment of students whose behavior impedes either their own learning or the learning of other students. Strategies for facilitating proactive educational, environmental and social-emotional techniques for supporting students with challenging behavior. 3 seminars, ~~1 activity~~ 2 activities. Prerequisite: Acceptance into Level I Special Education Credential Program, EDUC 440, EDUC 445, EDUC 446. *Change effective Fall 2006.*

EDUC 451 Special Education Seminar (4) (4) (4)

First enrollment emphasizes the role of special education in the public school, laws, understanding of field experiences and communication between general and special education. Second enrollment emphasizes collaborative development of behavior management strategies and direction of the activities of paraeducators. and third enrollment emphasizes co-teaching structures and the collaborative development of instructional strategies. Total credit limited to 12 units. 3 seminars, 1 activity. Must be taken concurrently with EDUC 442, EDUC 447, EDUC 449. Prerequisite: Acceptance into Level I Special Education Credential Program.

EDUC 452 Support and Transition Strategies in Special Education (~~4~~ 5)

Basic guidance techniques for teachers working with exceptional individuals and their families. Career selection, preparation, and counseling. Transition from school to work, and community resource utilization. 3 seminars, ~~1 activity~~, 2 activities. Prerequisite: Acceptance into Level I Special Education Credential Program, EDUC 440, EDUC 445, EDUC 446, EDUC 450. *Change effective Fall 2006.*

EDUC 454 Multiple Subject Student Teaching I (7) (CR/NC)

Field assignment involving observation, teaching, professional growth and related activities in public K-8 classrooms. Taken concurrently with EDUC 455 and EDUC 432. Credit/No Credit grading only. Prerequisite: Senior standing in BS in Liberal Studies and completion of LS 461, acceptance in STEP II or STEP B of the Multiple Subject Credential Program.

EDUC 455 Multiple Subject Student Teaching Seminar I (2)

Educational issues and research; rights and legal responsibilities (teachers and students); reform movements and moral dimensions in education; self evaluation based on teaching performance expectations (TPEs) and domains from standards for the teaching profession; student assessment and evaluation and development and assessment of MSCP Program Portfolio; and preparing a job search. 2 seminars. Prerequisite: Senior standing in BS in Liberal Studies and completion of LS 461, acceptance in STEP II or STEP B of the Multiple Subject Credential Program. Taken concurrently with EDUC 434, or EDUC 454, and EDUC 432.

EDUC 456 Multiple Subject Student Teaching II (12) (CR/NC)

Second field assignment involving observation, teaching, professional growth and related activities in public K-8 classrooms. Credit/No Credit grading only. Taken concurrently with EDUC 457. Prerequisite: Successful completion of EDUC 454, EDUC 455, and LS 461.

EDUC 457 Multiple Subject Student Teaching Seminar II (3)

Issues related to teaching, moral responsibilities of educators, setting professional goals, parent conferencing, self-assessment, implementation of formal and standardized assessments, interviews, completion of materials for a job search, and beginning the first year as a teacher. Planning, implementation, and evaluation of units of instruction, teaching performance assessments, and multiple subject program portfolio. 2 seminars, 1 activity. Taken concurrently with EDUC 456. Prerequisites: Successful completion of EDUC 454 and EDUC 455, and EDUC 430, EDUC 431 and EDUC 432.

EDUC 458 Summer Quarter Field Experiences: General and Special Education (4) (CR/NC)

Participation in public schools in activities representing different teaching roles in general and special education. Assumption of a teacher's responsibility for individual and small groups. May include student teaching in special education. Minimum 20 hours per week. Total credit limited to 12 units. Credit/No Credit grading only. Prerequisite: EDUC 304 and acceptance into Education Specialist Credential program. Must be taken concurrently with EDUC 459.

EDUC 459 Summer Quarter Special Education Seminar (4) (CR/NC)

Provides support and understanding of field experiences and the role of general and special education. Total credit limited to 8 units. 4 seminars. Credit/No Credit grading only. Prerequisite: EDUC 304 and acceptance into Level I Special Education Credential Program. Must be taken concurrently with EDUC 458.

EDUC 469 Part-Time Student Teaching (6) (CR/NC)

Part-time assignment in a classroom (Single Subject only). Includes teaching activities under the direction of a selected cooperating teacher in consultation with a university supervisor. Assignment consists of an entire morning in the classroom (or the equivalent) for one quarter. Credit/No Credit grading only. Prerequisite: Completion of courses and requirements to begin student teaching and approval of campus screening committee for credential candidates. Taken concurrently with EDUC 466, EDUC 467, EDUC 468.

EDUC 470 Selected Advanced Topics (1–4)

Directed group study of selected topics for advanced students. Open to undergraduate and graduate students. Class schedule will list topic selected. Total credit limited to 8 units. 1 to 4 lectures. Prerequisite: Consent of instructor.

EDUC 479 Student Teaching (12) (CR/NC)

Full-time assignment in a classroom (Single Subject only). Includes teaching activities under the direction of a selected cooperating teacher in consultation with a university supervisor. Assignment consists of an entire teaching day in the school for one quarter. Credit/No Credit grading only. Prerequisite: Completion of all courses and requirements prerequisite to full-time student teaching and approval by campus screening committee for credential candidates.

EDUC 480 Computer Based Curriculum (3)

Computer assisted instruction and computer based technology. Lesson planning and integration of technology into the K-12 curriculum. Familiarization with available educational courseware and software. Emphasis on

classroom application. 2 seminars, 1 activity. Prerequisite: Computer literacy, CSC 488 or CSC 416, or equivalent.

EDUC 481 Community Based Technology Integration (2)

Creation of materials and procedures to meet requirements for Level II technology, as defined by the CCTC, in a community based learning environment. Application of technology in a K-12 classroom. 1 seminar, 1 activity. Prerequisite: EDUC 480 or test equivalent.

EDUC 500 Individual Study (1–4)

Advanced study planned and completed under the direction of a member of the department faculty. Open only to graduate students who have demonstrated ability to do independent work. Enrollment by petition. Total credit limited to 8 units. ~~Only 6 units may be applied to degree requirements.~~ Prerequisite: Consent of department head, graduate major advisor, and supervising faculty member. *Change effective Summer 2005.*

EDUC 501 Applied Practices in Curriculum Development (4)

Overview of major curriculum trends; planning and development of a comprehensive curriculum project geared toward use of technology in teaching. Emphasis on practicality. 3 seminars, 1 activity. Prerequisite: Graduate standing.

EDUC 503 Seminar in Language Arts Curriculum and Methods (4)

Language arts curriculum: objectives, methods, content, materials, evaluation, current trends, research and field work activities. 3 seminars. 1 activity. Prerequisite: Graduate standing.

EDUC 504 Seminar in Science and Mathematics Curriculum and Methods (4)

In-depth study of science and mathematics curriculum. Objectives, methods, content, materials, evaluation, current trends, and assessments. 3 seminars, 1 activity. Prerequisite: Graduate standing.

EDUC 505 Seminar in Social Studies Curriculum and Methods (4)

In-depth study of the social studies curriculum: objectives, methods, content, materials, evaluation, current trends and field work activities. 3 seminars, 1 activity. Prerequisite: Graduate standing.

EDUC 506 Models of Instruction (4)

Analysis of a wide variety of approaches to elementary and secondary teaching that guide instruction in the classroom and in other educational settings. In-depth analysis and implementation of selected teaching strategies. 3 seminars, 1 activity. Prerequisite: Graduate standing.

EDUC 507 Instructional Materials and Technology (4)

Examination of instructional practices using technology. Review and application of commercial and teacher-made supplemental materials, software, and technological tools in curriculum, and their implementation. Systematic evaluation of the effectiveness of materials and technology for improving instruction. 3 seminars, 1 activity. Prerequisite: Graduate standing.

EDUC 510 Educational Finance and Resource Allocation (4)

Financing public schools in America: historical and current sources and types of funding. District level and site level funding and budgeting including priorities and purchasing procedures. Financial implications of personnel contracts and obligations. 3 seminars, 1 activity. Prerequisite: Graduate standing and consent of instructor.

EDUC 511 Educational Law and Governance (4)

Legal aspects of school administration including unions, collective bargaining, and contract administration. Governing roles of federal, state, and local agencies including boards and district administrators. 3 seminars, 1 activity. Prerequisite: Graduate standing and consent of instructor.

EDUC 512 Educational Organization and Management (4)

Principles of organization, management, and leadership and their relationship to educational effectiveness and productivity. Activity experience in the application of management theory in schools. 3 seminars, 1 activity. Prerequisite: Graduate standing and consent of instructor.

EDUC 513 Educational Planning and Decision Making (4)

Concepts of planning and decision making in educational administration that utilize a wide range of data gathering and analysis procedures. 3 seminars, 1 activity. Prerequisite: Graduate standing and consent of instructor.

EDUC 514 School Site Administration (4)

Principles and practices of effective building level administration in multicultural/multilingual environment. 4 seminars. Prerequisite: Graduate standing and consent of instructor.

EDUC 515 Educational Program Management and Evaluation (4)

Supervision, management, and evaluation of educational curriculum and educational programs. Current trends in program management including mapping, monitoring, alignment. 3 seminars, 1 activity. Prerequisite: Graduate standing and consent of instructor.

EDUC 516 Educational Personnel Supervision and Evaluation (4)

Principles and processes for the supervision and evaluation of certificated and classified staff including legal, research, and professional considerations. 3 seminars, 1 activity. Prerequisite: Graduate standing and consent of instructor.

EDUC 518 Administrative Services Fieldwork (3) (CR/NC)

Supervised fieldwork in school administration for supervision at the elementary and secondary level. Assignments must encompass three of the four academic quarters and must involve some multicultural experience. Total credit limited to 18 units, only 9 of which may be applied toward master's degree. Credit/No Credit grading only. Prerequisite: Admittance to the Administrative Services Credential program and consent of instructor.

EDUC 525 Literacy and Reading Processes, Programs and Technology (4)

Physiological, psychological and psycholinguistic components of the reading process. Applications of research findings of teaching reading, including innovative programs and the use of reading technology. 3 seminars, 1 activity. Prerequisite: Graduate standing.

EDUC 526 Diagnostic Procedures in Literacy and Reading (4)

Formal and informal methods of diagnosing and remediating reading problems in classrooms and reading clinics. 3 seminars, 1 activity. Prerequisite: Graduate standing.

EDUC 527 Language and Literacy Models for Second Language Learners (4)

Theory and models of learning in a second language at the high levels needed for school success. Analysis and synthesis of research in bilingualism and second language acquisition for teachers of second language learners. *Class Schedule* will list topic selected. Total credit limited to 8 units. 3 lectures, 1 activity. Prerequisite: EDUC 423 or EDUC 433 or comparable BCLAD coursework.

EDUC 529 Bilingual Special Education and Reading Instruction (4)

Principles, procedures and materials for teaching reading to bilingual students coupled with diagnostic and prescriptive methods for understanding reading problems of the bilingual and bilingual special education student. 2 seminars, 2 activities. Prerequisite: Graduate standing.

EDUC 530 Secondary, College, and Adult Literacy Practices (4)

Principles, procedures, and materials for improving literacy and reading in the subject matter areas with students of different backgrounds and abilities in grades 7 through college. Field experiences in teaching reading to adults, college, or secondary students. 3 seminars, 1 activity. Prerequisite: Graduate standing.

EDUC 532 Advanced Field Experiences in Education (3–12) (CR/NC)

Supervised advanced field experience and practical application of specialty for classroom teachers, reading and special education specialists, administrators and school support personnel. Total credit limited to 18 units for specialist credentials. Total credit limited to 6 units for the master's degree. 30 hours work experience per unit of credit. Credit/No Credit grading only. Prerequisite: Graduate standing, completion of basic teaching or

administrative credential, or consent of instructor.

EDUC 542 Administration of Special Programs and Services (4)

Principles and practices of organizing and administering special education, reading, counseling, and other support programs. Assessment and placement procedures, middle management's role, overview of specially funded programs, historical precedents and future trends. 3 seminars, 1 activity. Prerequisite: Graduate standing and consent of instructor.

EDUC 543 Advanced Studies in Assessment, Behavioral Support, Curriculum for Transition in Special Education (4)

Advancement of Level II candidate's knowledge and skills in assessment driven decision making for pupils with disabilities, supporting pupils with serious emotional or behavioral problems, and preparing pupils with disabilities for major life cycle school transitions. Analyzing assessment data to determine how to modify academic instruction, provide behavioral support, social skills training, career and vocational preparation. 3 seminars, 1 activity. Prerequisite: Admission into the Professional Level II Special Education Credential Program, EDUC 441.

EDUC 544 Advanced Collaboration and Consultation for Teachers of Students with Special Needs (~~4~~ 5)

Advanced studies and skills in educational consultation. Emphasis on the collaborative and consultative role of the special educator with a wide range of individuals including school personnel, parents, outside agencies, and paraprofessionals. 3 seminars, ~~1 activity~~, 2 activities. Prerequisite: Admission into the Professional Level II Special Education Credential Program or master's degree program. *Change effective Fall 2006.*

EDUC 545 Characteristics and Instruction of Pupils with Mild/Moderate Disabilities (4)

Characteristics of, and instructional strategies for students with mild/moderate disabilities. Organization and management of the special classroom. Evaluation of the instructional system. Individualization of instruction, appropriate methods for English language learners and interaction in the total school environment. 3 seminars, 1 activity. Prerequisite: Acceptance into Level I Special Education Credential Program, EDUC 440.

EDUC 547 Advanced Curricular and Instructional Adaptations for Students with Special Needs (4)

Advanced studies and skills in adaptation and modification of curriculum and instructional techniques to meet the needs of students with special needs. Educational implications of current learning theories as applied to individuals with special needs. Development and application of a remedial therapy with appropriate individual(s). 3 seminars, 1 activity. Prerequisite: Acceptance into Level II Special Education Credential Program or master's degree program.

EDUC 548 Advanced Collaboration, Consultation and Instructional Techniques for Teachers of Pupils with Moderate/Severe Disabilities (4)

Advanced studies in assessment, adaptation and modification of curriculum, and instructional techniques for teachers of pupils with moderate/severe disabilities. Emphasis on the collaborative, consultative, and management roles of the special educator, focus on interactions with school staff, parents, and outside agencies. 3 seminars, 1 activity. Prerequisite: Admission into the Professional Level II Special Education Credential Program, EDUC 441.

EDUC 550 Assessment Strategies for Special Education (~~4~~ 5)

Using norm referenced, criterion referenced, and curriculum based testing for assessing academic, behavioral, and physical status of individuals with exceptional needs for referral purposes. Instructional and evaluation decisions regarding exceptional students in school settings. 3 seminars, ~~1 activity~~, 2 activities. Prerequisite: Acceptance into Level I Special Education Credential Program, EDUC 440, EDUC 446, EDUC 545, EDUC 551. *Change effective Fall 2006.*

EDUC 551 Characteristics and Instruction of Pupils with Moderate/Severe Disabilities (4)

Definition and social behavioral characteristics of students with moderate to severe disabilities. Instructional strategies emphasizing law, assessment, educational settings, and the collaborative strategies necessary for

facilitating the inclusion of students with moderate/severe disabilities in general education settings. Emphasis on the communication, social skills, movement, mobility, sensory and specialized health care issues of students with moderate to severe disabilities. 3 seminars, 1 activity. Prerequisite: Acceptance into Level I Special Education Credential Program, EDUC 440.

EDUC 553 Current Issues, Emerging Research and Practices in Special Education (4)

Consideration of assumptions and techniques of educational research regarding the educational, personal, social and vocational difficulties affecting the development of individuals with exceptional needs; emphasizing their applicability to general and specific educational programs. 4 seminars. Prerequisite: Admission to Level I Special Education Credential Program or masters degree program.

EDUC 555 Introduction to the Counseling Profession (4)

Overview of the counseling profession, history, philosophy, theory and ethics. Required activity. 3 seminars, 1 activity. Prerequisite: Admission to MA Education program.

EDUC 556 Multicultural Counseling (4)

Initiation of critical analysis of personal beliefs and attitudes regarding counseling in a diverse society. Focus on a variety of approaches to explore the beliefs and attitudes of the student in counseling settings, and examination of strategies considered effective in working with diverse populations. 3 seminars, 1 activity. Prerequisite: Admission to MA Education program.

EDUC 557 Career Counseling (4)

Focus on the study and application of career development theories in career counseling. Utilizing appraisal instruments, community referral resources, occupational information, computerized retrieval systems, and personal and social data and required activities. 3 seminars, 1 activity. Prerequisite: Admission to MA Education program.

EDUC 558 Elementary School Counseling (4)

Focus on the development of skills for the integration of counseling activities into elementary school curriculum – specifically the role of the counselor in the development of a comprehensive guidance program, classroom guidance, counseling, consultation, program design and evaluation, curriculum and administration of special programs. 3 seminars, 1 activity. Prerequisite: PPS credential candidate, or consent of instructor.

EDUC 559 Secondary School Counseling (4)

A basic understanding of the secondary school environment, the role and responsibilities of the counselor within the school environment/community, the components of a secondary school counseling program, the develop-mental issues of 13-18 year olds, emerging standards for school counselors and the changing nature of student populations. 3 seminars, 1 activity. Prerequisite: PPS credential candidate, or consent of instructor.

EDUC 560 Counseling Theories (4)

Theories and practice of counseling with special emphasis on the counseling process. Emphasis of conditions of counseling, counseling techniques, counseling diverse populations and the counselor as a professional helper. 3 seminars, 1 activity. Prerequisite: EDUC 555 and admission to MA Education program.

EDUC 561 Group Counseling (4)

Theory and practice of group counseling, client selection, group structure, process and termination, and application of theories to specific developmental groups. Communication and facilitation skills emphasized with relevant ethics and law. 3 seminars, 1 activity. Prerequisite: EDUC 555, EDUC 560 or consent of instructor.

EDUC 562 Student Development–Higher Education (4)

Exploration of the roles and competencies of the student development specialist in higher education. Review of relevant developmental theory with emphasis on practical implementation. Explore current issues and trends in higher education, and organizational framework. 4 seminars. Prerequisite: Admission to MA Education program.

EDUC 563 Violence Prevention in Schools (4)

Specific counseling strategies and issues related to violence in the schools. Alienation, violence, parenting, as they relate to the factors associated with school violence. Evaluation of effective intervention programs for K-12 schools. 3 seminars, 1 activity. Prerequisite: Admission to MA Education program.

EDUC 564 Legal and Ethical Issues in Counseling 4()

Consideration of legal, ethical, cultural and related professional issues as they affect the practice of counseling. 3 seminars, 1 activity. Prerequisite: Admission to MA Education Program or PPS Credential Program.

EDUC 565 Counseling Measurement and Assessment (4)

Training and evaluation in the utilization of tests, scales, measures, and other instruments with K-12, and college-age students. An understanding of culturally appropriate tests and measures, collaboration with school personnel, parents, and students in the review and interpretation of test scores and measures. 3 seminars, 1activity. Prerequisite: Admission to MA Education Program, Counseling and Guidance Specialization, or to PPS Credential Program.

EDUC 566 Leadership and Consultation in Counseling (4)

Development of skills in planning, organizing, coordinating, and delivering programs that generate systemic change through establishing collaboration within schools, communities and other stakeholders. Emphasis on social action and its role in the counseling profession. 3 seminars, 1 activity. Prerequisite: Admission to MA Education Program or PPS Credential Program.

EDUC 568 Individual Counseling Techniques (4)

Theory and practice of individual counseling, process and termination, and application of theories to specific developmental issues working with K-12 students. Communication and facilitation skills emphasized, working with diverse populations and following legal and ethical guidelines. 3 seminars, 1 activity. Prerequisite: Admission to MA Education Program, Counseling and Guidance Specialization, or to PPS Credential Program.

EDUC 573 Field Experience, Counseling (1–12) (CR/NC)

Practical application of guidance services and counseling in public schools, colleges and community settings. Seminars with university staff included. Total credit limited to 24 units. Credit/No Credit grading only Maximum of 6 units may be applied toward MA Education. Prerequisite: EDUC 555, EDUC 560 and Advancement to Candidacy.

EDUC 581 Graduate Seminar in Education (1–3)

Contemporary problems in education. Trends, developments, and issues. Total credit limited to 9 units. Prerequisite: Graduate standing.

EDUC 586 Introduction to Inquiry in Education (4)

Introduction to professional literature search techniques and to professional organizations as a basis for educational inquiry. Explanation of social construction of knowledge, and the philosophical basis of quantitative and qualitative research. 3 seminars, 1 activity. Prerequisite: Admission to UCTE master's program.

EDUC 587 Educational Foundations and Current Issues (4)

Historical, organizational, legal and philosophical characteristics of American education. Emphasis on the analysis of contemporary issues focusing on these characteristics. 4 seminars. Prerequisite: Graduate standing.

EDUC 588 Education, Culture, and Learning (4)

Cultural characteristics of educational institutions and practice. Review of theory and research relating to the social and organizational context in which learning and teaching takes place. 4 seminars. Prerequisite: Graduate standing.

EDUC 589 Educational Research Methods (4)

Introduction to research methodologies, application of inferential and descriptive statistics, critical analysis of research designs and data collection techniques. 3 seminars, 1 activity. Prerequisite: EDUC 586.

EDUC 590 Research Applications in Education (4)

Application of social science research techniques to problems in education and human services. Capstone experience for the UCTE master's inquiry course sequence. Completion of an inquiry project required. 2 seminars, 2 activities. Prerequisite: EDUC 589.

EDUC 599 Thesis or Project (3) (3)

Completion of a thesis or project pertinent to the field of education. Student must register for each quarter of advisement. Prerequisite: Consent of graduate committee and supervising faculty member(s).

BS BIOMEDICAL ENGINEERING – 2005-07 Catalog

Biomedical and General Engineering Department
Engineering Bldg. (13), Room 260
(805) 756-6400

Program approved Fall 2005
BMED courses begin Fall 2006

- *60 units upper division*
- *2.0 GPA*
- *GWR*
- *USCP*

** = Satisfies General Education requirement*

MAJOR COURSES	
ENGR 110 Engineering Science I	3
BMED 111 Biomedical Engineering Calculations	3
BMED 212 Intro to Biomedical Engineering Design	3
BMED 310 Biomedical Engineering Measuremt/Analysis	4
BMED 410 Biomechanics	4
BMED 420 Biomaterials	4
BMED 425 Biomedical Engineering Transport	4
BMED 430 Biomedical Modeling	4
BMED 440 Bioelectronics and Instrumentation	4
BMED 450 Special Topics in Biomedical Engineering	4
BMED 455 Biomedical Engineering Design I	4
BMED 456 Biomedical Engineering Design II	4
BMED 460 Engineering Physiology	4
Advisor approved technical electives (300/400)	14
Senior project	4
	67

SUPPORT COURSES	
BIO 161 Intro to Cell & Molecular Bio (B2/B4)*4	4
CHEM 124 Gen Chem for Engrg I (B3/B4)*	4
CHEM 125 Gen Chem for Engrg II (Add'l Area B)*	4
ENGL 149 Technical Writing for Engineers (A3)*	4
MATH 141,142 Calculus I, II (B1)*	4,4
MATH 143 Calculus III (Add'l Area B)*	4
MATH 241 Calculus IV	4
MATH 244 Linear Systems	4
PHYS 131 General Physics I (B3)*	4
PHYS 132 General Physics II	4
PHYS 133 General Physics III	4
Advisor approved math and science electives	16

Select one course from:
ZOO 331, ZOO 332, BIO 432, BIO 433.

Select one course from GE B6*:
MATH 344, STAT 312, PHYS 417.

Typical remaining course selections include, but are not limited to:
BIO 302 OR 303 OR 351, BIO 405, BIO 447, BIO 452; CHEM 312, CHEM 313, CHEM 444, CHEM 473, MCRO 221 OR 224, MCRO 225, MCRO 320, MCRO 402, ZOO 426

CE 204 Mechanics of Materials I	3
CSC 101 Fundamentals of Computer Science or CSC 234 C and Unix	3
EE 201 Electric Circuit Theory	3
IME 314 Engineering Economics	3
MATE 210 Materials Engineering	3
ME 211 Engineering Statics	3
ME 212 Engineering Dynamics	3
ME 302 Thermodynamics	3
ME 341 Fluid Mechanics I	3
	91

GENERAL EDUCATION (GE)

72 units required; 32 units are in Support.

®Minimum of 8 units required at the 300-400 level.

Area A Communication (8 units)	
A1 Expository Writing	4
A2 Oral Communication	4
A3 Reasoning, Argumentation, and Writing * 4 units in Support	0
Area B Science and Mathematics (no additional units required)	
B1 Mathematics/Statistics * 8 units in Support	0
B2 Life Science *4 units in Support	0
B3 Physical Science* 4 units in Support	0
B4 One lab taken with either a B2 or B3 course	
B5 (requirement for Liberal Arts students only)	
B6 Upper-division Area B * 4 units in Support	0
Additional Area B units * 8 units in Support	0
Area C Arts and Humanities (16 units)	
C1 Literature	4
C2 Philosophy	4
C3 Fine/Performing Arts	4
C4 Upper-division elective	4
Area D/E Society and the Individual (16 units)	
D1 The American Experience (40404)	4
D2 Political Economy	4
D3 Comparative Social Institutions	4
D4 Self Development (CSU Area E)	4
	40
ELECTIVES	**0**
	198

MA HISTORY – 2005-07 Catalog

History Department
Faculty Office Bldg. (47), Room 27C
805 756-2543

Approved – Effective Fall 2005

General Characteristics

The program in history emphasizes concentrated study in area specialties, with students gaining a thorough grounding in the latest historiography. In addition, the program maintains that historical study must be predicated upon sustained research, engagement with historical problems, and written communication. Completion of the MA program in history will allow students the following options:

- Teach history at the elementary, secondary, or community college level.
- Give students the critical skills and knowledge to enter into the worldwide information economy.
- Allow community members to expand their historical knowledge.
- Prepare students for transfer to Ph.D. programs at other universities.

Prerequisites

Admission to the MA program will require:

1. Possession of an undergraduate degree from an accredited college or university.
2. An overall grade point average of 3.0 for the last 90 units of their undergraduate work.
3. Submission of a writing sample, in the form of a senior project or upper division paper.
4. Related undergraduate coursework. Students without an undergraduate degree in history will be required to demonstrate adequate preparation for graduate study in history, as determined by the Graduate Coordinator.

Program of Study

- 48 units of graduate work in areas specified (49 units for those students writing a MA Thesis).
- a grade point average of at least 3.0 after 12 units of graduate coursework.
- MA Thesis or Comprehensive Examinations in two distinct areas of study.

Foreign Language Study

Students are encouraged to learn and use foreign languages in the MA program. Students who plan further graduate study in history are particularly encouraged in this direction since proficiency in two foreign languages is usually required in doctoral programs.

Applications

Applications for admission and requests for further information should be directed to the Admissions Office or the Graduate Coordinator of the MA History program. All applications should include a writing sample (preferably an extended research paper), undergraduate transcripts, and two letters of recommendation.

	Units
HIST 504 Graduate Study in History	4
History Seminars	20
Select 5 courses from the following. Each is repeatable up to 12 units.	
HIST 505 Seminar in U.S. History (4-12)	
HIST 506 Sem. in Modern European History (4-12)	

HIST 507 Sem. in East Asian History (4-12)	
HIST 508 Sem. in Latin American History (4-12)	
HIST 509 Seminar in African History (4-12)	
400-500 level HIST electives	16
400-level courses will include extra work for graduate students. (All courses must be taken after student has been awarded an undergraduate degree and may not repeat undergraduate courses or their equivalent.)	
Comprehensive Exam Option (total 48 units)	
HIST 512 Supervised Reading for Comprehensive Exams (2) (2)	4
4 additional units of 400-500 HIST electives	4
Thesis Option (total 49 units)	
HIST 599 Thesis (3) (3) (3)	9
	48/49

BA Interdisciplinary Studies – 2005-07 Catalog

(Adult Degree Program)

Continuing Education and University Outreach
Jespersen Hall (116), Room 101
(805) 756-2053

- *60 units upper division*
- *2.0 GPA*
- *GWR*
- *USCP*

MAJOR COURSES	
IS 101 Orientation to IS and the University	3
IS 301 Critical Issues Seminar	4,4
IS 302 Analytical Skills Seminar	4
IS 450 Adv. Investigation Seminar	5
IS 460 Capstone Project	6
Select one course from the following eight areas:	32
Applied technology (4)	
Business (4)	
Communications/English (4)	
Ethnic studies/US Cultural Pluralism (4)	
Fine and performing arts (4)	
Philosophy/religion (4)	
Science or nutrition (4)	
Social science (4)	
Five additional courses selected by the Faculty Program Committee	20
	78

UPPER-DIVISION GENERAL EDUCATION COURSES	
®See page 69 for complete GE course listing.	
Arts and humanities (C4)	4
Society/Individual (D5)	4
Technology (Area F)	4
	12
TRANSFERRED UNITS	**90**
	180