UNIVERSITY PROGRAMS

KELLOGG HONORS COLLEGE
Suketu Bhavsar, Director
The Cal Poly Pomona Kellogg Honors College challenges talented students to achieve academic and personal goals. The College provides an intellectually and socially stimulating environment for students of all majors to come together as a community of scholars. Admission is selective, a faculty committee chooses Honors students based on their application packages. Honors students must maintain a 3.3 GPA to remain in the Kellogg Honors College during their time at Cal Poly Pomona. Students may graduate from the Honors College by participating in special Honors classes; some in their majors and several which satisfy the university's general education requirements. (Please see the section on Special Programs for more information on the Kellogg Honors College.)

THE CENTER FOR COMMUNITY SERVICE-LEARNING and VolunteerBASE (Bronco Advancing Service Excellence)
The Center for Community Service-Learning and VolunteerBASE facilitate curricular and co-curricular civic engagement opportunities for the Cal Poly Pomona community. For further information, please see our full description of programs in the Special University Centers section of this catalog.

INTERDISCIPLINARY GENERAL EDUCATION PROGRAM
The Interdisciplinary General Education Program (IGE) offers students a unique and stimulating choice to fulfill general education requirements. These requirements, which apply to all California State University campuses, help students broaden their skills and understanding in areas beyond the major and develop the qualities of an educated individual. Founded in 1983, IGE is one of the longest-lived interdisciplinary programs in the California State University and has earned national recognition for its success in general education, team teaching, outcomes assessment and learning communities.

The IGE curriculum encourages students to connect personal experience with course readings, to explore their values and goals, and to develop their own ideas and interpretations. Students learn through discussions, papers and team projects. IGE students also attend music, theatre, museum and other cultural experiences that enhance the curriculum. The IGE Program satisfies 32 units of lower-division humanities and social sciences general education requirements.

IGE 120 Consciousness and Community (4)
First knowings; origin of consciousness, myth, symbol, performance, and ceremony; prehistory and patterns of living, making of meaning; university experience. 4 Lecture/discussion. Activity fee may be required. Pre-requisite: eligibility for or completion of college level writing course.

IGE 121 Rationalism and Revelation: The Ancient World (4)
The nature of tragedy; the ways of warriors, prophets, tyrants, philosophers, and citizens; ethics, convictions, and the sacred. 4 Lecture/discussions. Activity fee may be required. Prerequisite: IGE 120 or eligibility for or completion of college level writing course and IGE 120 as corequisite.

IGE 122 Authority and Faith: The Medieval and Renaissance Worlds (4)
Visions of hell, politics, social order, and redemption; constructions of the sacred and secular selves; journey of the soul; private lives and public spaces. 4 Lecture/discussions. Activity fee may be required. Prerequisite: IGE 121.

IGE 220 Ways of Knowing: Culture and Contact (4)
Explorations of self and other; constructing Otherness; presentations of difference; colonial encounters, cultural collisions; ways of knowing in relation to culture. Inquiries are historically grounded in both the modern world and the colonial period. 4 Lecture/discussions. Prerequisite: IGE 122. Activity fee may be required.

IGE 221 Ways of Coexisting: Reform and Revolution (4)
Explorations of meanings of "coexistence"; negotiation difference; crossing borders; domination and resistance; reform and revolution. Inquiries are historically grounded in both the modern world and the American revolutionary and Constitutional periods. 4 Lecture/discussions. Prerequisite: IGE 220. Activity fee may be required.

IGE 222 Ways of Doing: Technology and Human Purpose (4)
Explorations of technology and human purpose; construction of science as a way of knowing gender, class, and race in science and technology; ethical frameworks. Inquiries are historically grounded in both the modern world and the Industrial Age. 4 Lecture/discussions. Prerequisite: IGE 221. Activity fee may be required.

IGE 223 Ways of Living: The Contemporary World (4)
Explorations of environment epistemology, ethics, and aesthetics; environmental education and responsibility; communities and cultures engaging sustainable practices; global thinking and doing; global citizenship and justice. Inquiries are historically grounded in the modern and postmodern worlds. 4 Lecture/discussions. Prerequisite: IGE 222. Activity fee may be required.

IGE 224 Connections Seminar: Exploration and Personal Expression (4)
Research and presentation of an interdisciplinary project which extends and synthesizes themes from the IGE experience. 4 Lecture/discussions. Pre-requisite: IGE 223.

INTERNATIONAL PROGRAMS
Faiza W. Shereen, Director, International Center
These course designations serve Cal Poly Pomona students participating in Cal Poly Pomona Exchange Programs or in CSU International Programs (IP) overseas as vehicles for residence credit and are administered by the International Center.

IPC 198 Foreign Study Topics (1–6)
Study undertaken in a foreign university under the auspices of The California State University International Programs.

IPC 398 Foreign Study Topics (1–6)
Study undertaken in a foreign university under the auspices of The California State University International Programs.

IPC 598 Foreign Study Topics (1–6)
Graduate study undertaken in a foreign university under auspices of The California State University International Programs or Cal Poly Pomona Exchange Programs. Maximum credit 9 units.
NATIONAL STUDENT EXCHANGE
Cynthia Chatfield, Coordinator
These course designations serve Cal Poly Pomona students participating in the National Student Exchange Consortium at various universities and colleges in the United States as vehicles for Cal Poly Pomona residence maintenance.

NSE 198 National Student Exchange Study Topics: (1–15)
Study undertaken at a member campus of the National Student Exchange Consortium.

NSE 398 National Student Exchange Study Topics: (1–15)
Study undertaken at a member campus of the National Student Exchange Consortium.

LIBRARY
Harold B. Schleifer, Dean

Library Instruction/Information Competence
The Library’s program for Information Competence is designed to introduce students to the basic sources and library research strategies needed for a specific course or assignment. The presentations are designed for the particular course assignment, while also emphasizing general principles applicable to future information gathering needs in support of lifelong learning. During the presentation, the librarian will illustrate to the students how to think critically about their information needs, as well as how to evaluate sources of information for relevance, reliability and objectivity. We offer instructional sessions in a computerized classroom that allows for the demonstration and hands on learning of library resources. The class period may include the following: introduction to library services and collections; the Library Catalog; periodical indexes and databases in various formats—print, online, CD-ROM; internet resources; use of reference books and other library materials. Students receive printed bibliographies listing important sources or procedures. We also offer individual instruction, web based tutorials, and printed guides. Instructors may schedule classes by calling the Reference/Instruction/Collections office at (909) 869-3076 or via the web at www.csupomona.edu/~library/reference/teachingservices.html

COLLEGE READING SKILLS PROGRAM
The College Reading Skills Program offers a series of four one-unit nonbaccalaureate courses for students who need an extra unit to maintain full-time status. These courses do not count toward degree requirements or GPA. Participants enrolled in the program receive individualized reading tutoring, academic advising, and may qualify for supplemental financial aid.

LRC 090 College Reading Skills (1)
Beginning course in reading skills development for students in the College Reading Skills Program. Diagnosis of reading skills; individual placement in developmental reading materials; individual tutorial programs; workshops. Independent study/supervised activities. This is a nonbaccalaureate-level course for students who need an extra unit to maintain full-time status, but it does not count toward degree requirements or GPA. Prerequisites: consult the director of the College Reading Skills Program.

LRC 091 College Reading Skills (1)
Continued work in developmental reading for students in the College Reading Skills Program. Evaluation of reading strengths and weaknesses; individual placement in developmental reading materials; individual tutorial programs; workshops. Independent study/supervised activities. This is a nonbaccalaureate-level course for students who need an extra unit to maintain full-time status, but it does not count toward degree requirements or GPA. Prerequisite: LRC 090.

LRC 092 College Reading Skills (1)
Developmental reading for students in the College Reading Skills Program who wish to augment the reading skills developed in LRC 090 and LRC 091. Evaluation of reading strengths and weaknesses; individual placement in developmental reading materials; individual tutorial programs; workshops. Independent study/supervised activities. This is a nonbaccalaureate-level course for students who need an extra unit to maintain full-time status, but it does not count toward degree requirements or GPA. Prerequisite: consult the director of the College Reading Skills Program.

LRC 093 College Reading Skills (1)
Developmental reading for students in the College Reading Skills Program who wish to augment the reading skills developed in LRC 090, LRC 091, and LRC 092. Evaluation of reading strengths and weaknesses; individual placement in developmental reading materials; individual tutorial programs; workshops. Independent study/supervised activities. This is a nonbaccalaureate-level course for students who need an extra unit to maintain full-time status, but it does not count toward degree requirements or GPA. Prerequisite: consult the director of the College Reading Skills Program.

MILITARY SCIENCE AND LEADERSHIP – ARMY ROTC
Major Randall Cartmill, Officer in Charge

MSL 101/101A Foundations of Officerhood (2/0)
Introduces students to issues and competencies that are central to a commissioned officer’s responsibilities. Establishes framework for understanding officerhood, leadership, and Army values followed and “life skills” such as physical fitness and time management. 2 hours lecture, 1 two-hour activity. Co-requisite: MSL 101A. Participation in a weekend exercise is optional, but highly encouraged.

MSL 102/102A Basic Leadership I (2/0)
Establishes foundation of basic leadership fundamentals such as problem solving, communications, briefings and effective writing, goal setting, techniques for improving listening and speaking skills and an introduction to counseling. 2 hours lecture, 1 two-hour activity. Co-requisite: MSL 102A. Participation in a weekend exercise is optional, but highly encouraged.

MSL 103/103A Basic Leadership II (2/0)
Continuation of Basic Leadership I. Establishes foundation of basic leadership fundamentals such as problem solving, communications, briefings and effective writing, goal setting, techniques for improving listening and speaking skills and an introduction to counseling. 2 hours lecture, 1 two-hour activity. Co-requisite: MSL 103A. Participation in a weekend exercise is optional, but highly encouraged.

MSL 150 American Military History (6)
Integration of the basic knowledge of military history into the education of a future officer. Employs American military history as a tool for studying military professionalism and for applying critical-thinking skills and decision-making skills to military problems while pursuing education as an officer. 4 hours lecture.
MSL 179A Basic Course Physical Fitness (1)

Only open to students in MS 101, 102, 201 and 202. Optional in MS 101, MS 102 and MS 103; required in MS 201, MS 202 and 203 series, with different roles for students at different levels in the program. Participate in and learn to lead a physical fitness program. Emphasis on the development of an individual fitness program and the role of exercise and fitness in one’s life. 2 hours activity.

MSL 201/201A Individual Leadership Studies (2/0)

Students identify successful leadership characteristics through observation of self and others through experiential learning exercises. Students record observed traits in a dimensional leadership journal and discuss observations in small group settings. 2 hours lecture, 1 two-hour activity. Co-requisite: MSL 201A. Participation in a weekend exercise is optional, but highly encouraged.

MSL 202/202A Leadership and Teamwork I (2/0)

Study examines how to build successful teams, various methods for influencing action, effective communication in setting and achieving goals, the importance of timing the decision, creativity in the problem solving process, and obtaining team buy-in through immediate feedback. 2 hours lecture, 1 two-hour activity. Co-requisite: MSL 202A. Participation in a weekend exercise is optional, but highly encouraged.

MSL 203/203A Leadership and Teamwork II (2/0)

Continuation of Leadership and Teamwork I. Study examines how to build successful teams, various methods for influencing action, effective communication in setting and achieving goals, the importance of timing the decision, creativity in the problem solving process, and obtaining team buy-in through immediate feedback. 2 hours lecture, 1 two-hour activity. Co-requisite: MSL 203A. Participation in a weekend exercise is optional, but highly encouraged.

MSL 210 Leaders Training Course (0)

A 28-day summer camp conducted at an Army post. The student receives a stipend for this activity. Travel, lodging and most meal costs are defrayed by the Army. The environment is rigorous, and is similar to Army Basic Training. No military obligation is incurred. Open only to students who have not taken all six of MSL 101, 102, 103, 201, 202 and 203, and who pass a physical examination (provided by ROTC). Completion of MSL 210 qualifies a student for entry into the Advanced Course. Three different cycles are offered during the summer, but spaces are limited by the Army. Candidates can apply for a space any time during the school year prior to the summer. Graded on a CR/NC basis only.

MSL 279A Advanced Course Physical Fitness (1)

This is a required course open only to students in the Advanced Course Series (MSL 301, 302, 303, 401 402 and 403), of which this program is an integral part, with different roles for students at different levels in the program. Participate in and learn to plan and lead physical fitness programs. Develops the physical fitness required of an officer in the Army. Emphasis on the development of an individual fitness program and the role of exercise and fitness in one’s life. 2 hours activity.

NOTE:
The Advanced Course consists of the courses MSL 301, 302, 303, 401, 402 and 403. It is open only to students who have completed the Basic Course or earned placement credit for it. A monthly stipend is paid during fall-winter-spring quarters to full-time enrolled 300- and 400-level students. Students must complete all courses above the 300-level, including a five-week summer Advanced Camp (taken usually between the junior and senior years) to qualify for a commission as an officer in the United States Army. The courses must be taken in sequence unless otherwise approved by the Professor of Military Science.

MSL 301/301A Leadership and Problem Solving (2/0)

Students conduct self-assessment of leadership style, develop personal fitness regimen, and learn to plan and conduct individual/small unit tactical training while testing reasoning and problem-solving techniques. Students receive direct feedback on leadership abilities. 2 hours lecture, 1 two-hour activity. Co-requisite: MSL 301A.

MSL 302/302A Leadership and Ethics I (2/0)

Examines the role communications, values, and ethics play in effective leadership. Topics include ethical decision-making, consideration of others, spirituality in the military, and survey Army leadership doctrine. Emphasis on improving oral and written communication abilities. 2 hours lecture, 1 two-hour activity. Co-requisite: MSL 302A.

MSL 303/303A Leadership and Ethics II (2/0)

Continuation of Leadership and Ethics I. Examines the role that communications, values, and ethics play in effective leadership. Topics include ethical decision-making, consideration of others, spirituality in the military, and survey Army leadership doctrine. Emphasis on improving oral and written communication abilities. 2 hours lecture, 1 two-hour activity. Co-requisite: MSL 303A.

MSL 379A Advanced Course Army Physical Fitness Trainer (1)

Only offered to (and required of) students in MSL 301, 302, 303 of which this program is an integral part of the leadership training and physical conditioning of ROTC Cadets. Participate in, learn to plan and lead physical fitness programs. Develops the physical fitness conditioning required of an officer in the Army. Emphasis is on the development of an organizational fitness program and the role of exercise and fitness to the organization. 2 hours activity.

MSL 401/401A Leadership and Management (2/0)

Develops student proficiency in planning and executing complex operations, functioning as a member of a staff, and mentoring subordinates. Students explore training management, methods of effective staff collaboration, and developmental counseling techniques. 2 hours lecture, 1 two-hour activity. Co-requisite: MSL 401A.

MSL 402/402A Officership I (2/0)

Study includes case study analysis of military law and practical exercises on establishing an ethical command climate. Students must complete a semester long Senior Leadership Project that requires them to plan, organize, collaborate, analyze, and demonstrate their leadership skills. 2 hours lecture, 1 two-hour activity. Co-requisite: MSL 402A.

MSL 403/403A Officership II (2/0)

Study includes case study analysis of military law and practical exercises on establishing an ethical command climate. Students must complete a semester long Senior Leadership Project that requires them to plan, organize, collaborate, analyze, and demonstrate their leadership skills. 2 hours lecture, 1 two-hour activity. Co-requisite: MSL 403A.

MSL 479A Advanced Course Army Physical Fitness Evaluator (1)

Students participate as senior members, learn to evaluate the plans and leading of physical fitness programs. Evaluates the development of the physical fitness conditioning required of an officer in the Army. Emphasis is on the development of an organizational fitness program and the role of exercise and fitness in the organization. Restricted to students in MSL
401, or 402, or 403 of which this program is an integral part in the leadership training and physical conditioning of ROTC Cadets. 2 hours activity.

CAL POLY POMONA UNIVERSITY

The CPU designation means that such courses are offered for the entire university community regardless of major or school. Many CPU courses have been specifically designed to meet the requirements of general education or to assist students in career/academic choices. For further information in CPU coursework please contact the Office of Undergraduate Studies, Building 98.

GENERAL EDUCATION COURSES

CPU 210/210A Actualized Living (3/1)
Lifelong physiological and socio-psychological aspects of the leisure phenomenon. Experience in assessing student’s leisure knowledge and habits coupled with a comprehensive leisure counseling follow-through. Includes a one unit component in death and dying. Team taught. 2 lectures, 1 lecture/discussion, 1 two-hour activity. Corequisites: CPU 210/210A.

ACADEMIC/CAREER GUIDANCE COURSES

CPU 100 Career and Personal Exploration (1–4)
Systematic development of information about (1) self—including values, interests, and skills, (2) environment—including career clusters, fields and occupational information, (3) decision-making, and (4) career search techniques. Includes vocational testing and use of the computer-based System of Interactive Guidance and Information (SIGI PLUS). Materials fee required.

CPU 102 Fundamental Principles of Learning Skills (3)
Introduction to and practice in college study techniques and learning skills including: listening, notetaking, memory improvement, and time management. Topics discussed among others: class scheduling, career planning, use of the library and advisory centers, and co-curricular programs. 3 lecture discussions.

CPU 109 Fundamental Principles of Residential Leadership (2)
This course offers students an on-going orientation to effective residential leadership. The course covers the foundation of residential leadership, and current issues as they relate to community development. A special focus is placed on the individual student’s growth as a leader by applying principles and concepts through experiential situations. The course concerns such topics as multicultural leadership, service learning, group leadership, transferable leadership skills, and logistical leadership. Prerequisite: permission of instructor. Instruction is by lecture, laboratory, or a combination.

CPU 123 Community Engagement (1–4)
Experiential learning through volunteer opportunities on-site at approved community service agencies. Student meets with faculty and community partner to establish learning objectives. Periodic meetings with instructor paired with final reflection assignment. Activity/Discussion. May be repeated for credit. CR/NC grading only. Prerequisite: English 104, consent of instructor. Student should confer with instructor and community partner to set-up a volunteer placement prior to enrolling in the course.

CPU 299/299A/299L Special Topics for Lower Division Students (1–4)
Group study of a selected topic, the title to be specified in advance. Total credit limited to eight units, with a maximum of four units per quarter. Prerequisite: permission of instructor. Instruction is by lecture, laboratory, or a combination. Corequisites may be required.

CPU 499/499A/499L Special Topics for Upper Division Students (1–4)
Group study of a selected topic, the title to be specified in advance. Total credit limited to eight units, with a maximum of four units per quarter. Prerequisite: permission of instructor. Instruction is by lecture, laboratory, or a combination. Corequisites may be required.

SCIENCE, TECHNOLOGY, AND SOCIETY MAJOR

Peter Ross, Director

The Science, Technology, and Society (STS) Major is an interdisciplinary program which integrates knowledge in the natural sciences, and in technology as well as in history, philosophy, sociology, economics, political science, geography, and anthropology. Consequently, courses included in the STS Major curriculum are taught by faculty in seven of the University’s Colleges as well as the Lyle Center for Regenerative Studies.

STS examines the goals and practices of science and technology, including how such goals and practices are affected by economic, cultural, and political events, and conversely, how these events are in turn affected by developments in science and technology.

Moreover, these three sorts of questions interrelate in complicated ways. Consider the debate about global warming. This debate obviously raises issues concerning the impact of technology on societies, but it also raises issues about the reliability of the scientific research involved in identifying this impact, the use and interpretation of this research by political leaders and public policy makers, and the effect of public policy in driving possible technological solutions.

Students are capable of earning a Bachelor of Arts in Science, Technology, and Society. The STS Major prepares students who seek a job requiring a broader perspective on science and technology than that provided by a traditional science or technology major; such jobs include those in law or business which are engaged with aspects of science and technology, in science and technology policy public making or analysis, in science and technology public interest advocacy, and in science journalism. In brief, the STS Major prepares students for jobs that require scientific and technological literacy as well as a broad perspective on science and technology and an ability to write and argue from this perspective.

Required Core Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
<th>Restrictions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to Science, Technology, and Society</td>
<td>STS 201</td>
<td>201</td>
<td>(4)</td>
</tr>
<tr>
<td>Ethical Consideration in Technology and Applied Science</td>
<td>EGR 402</td>
<td>402</td>
<td>(4)</td>
</tr>
<tr>
<td>History of American Science and Technology</td>
<td>HST 408</td>
<td>408</td>
<td>(4)</td>
</tr>
<tr>
<td>Philosophy of Science</td>
<td>PHL 483</td>
<td>483</td>
<td>(4)</td>
</tr>
<tr>
<td>Technology and Society</td>
<td>SOC 440</td>
<td>440</td>
<td>(4)</td>
</tr>
<tr>
<td>Science, Technology, and Society</td>
<td>STS 461</td>
<td>461</td>
<td>(4)</td>
</tr>
<tr>
<td>Capstone Seminar</td>
<td>STS 462</td>
<td>462</td>
<td>(3)</td>
</tr>
<tr>
<td>Senior Project</td>
<td>STS 462</td>
<td>462</td>
<td>(3)</td>
</tr>
</tbody>
</table>

Credit earned in the following courses may be applied toward the major if the student is approved by the STS Program Director.

- EGR 402
- HST 408
- PHL 483
- SOC 440
- STS 461
- STS 462
- STS 462

The total required for the major will vary, depending on the student's specific application for electives. The total for the major is 36 units.
Senior Project ................................. STS 463 (3)

Required Core Units ............................................. 30

Elective Core Courses

History of Science & Technology
Select 1 course from the following: ...................................... 4
History of Anthropology Theory .................................... ANT 380 (4)
History and Philosophy of Chemistry ............................... CHM 306 (4)
History and Philosophy of Systems Science ......................... CSA 300 (4)
The Scientific Revolution .............................................. HST 421 (4)
Modern Science in World History ................................... HST 423 (4)
Technology in World History ......................................... HST 432 (4)
History of Mathematics .............................................. MAT 306 (4)
History of Technology in Music ...................................... MU 310 (4)
History of Physics .................................................... PHY 306 (4)
History and Systems .................................................. PSY 410 (4)

Social and Cultural Studies of Science & Technology
Select 2 courses from the following: ................................... 8
Plants and Civilization ................................................. AGR 311 (4)
Environment, Technology and Culture ............................... ANT 350 (4)
Plants and People ..................................................... BOT 307/307A (3/1)
Literature of Science and Fiction .................................... ENG 222 (4)
Beyond Curie: Women in Math ......................................... EGR/EIS/SCI 475 (4)
Gender, Identity, and Technology ..................................... EWS 425 (4)
Environmental Geography ............................................. GEO 330/330A (3/1)
Visions of Science and Technology .................................... IGE 320 (4)
Energy and Society ..................................................... PHY 301 (4)
Physics of Everyday Experience ....................................... PHY 302 (4)
Life Support Processes .................................................. RS 301 (4)
Global Regenerative Systems .......................................... RS 302 (4)
Organization for Regenerative Practices ............................. RS 303 (4)
Sustainable Communities ............................................... RS 450 (4)
Social Change .......................................................... SOC 340 (4)

Ethics and Policy of Science and Technology
Select 2 courses from the following: ................................... 7-8
Ethical Issues in Food, Agricultural and Apparel Industries .... AG 401 (4)
Genetics and Human Issues .......................................... BIO 300 (4)
Environment and Society .............................................. BIO 304 (4)
Chemistry in Life, Civilization, and World ......................... CHM 210 (4)
Computers and Society ............................................... CS 375 (4)
Seminar in Natural Resource Economics ............................ EC 429 (4)
Seminar in Environmental Economics ............................... EC 435 (4)
Air Resource Management ............................................ EC 436 (4)
Waste Management ..................................................... EC 438 (4)
Water Resource Management ......................................... EC 439 (4)
Industry Studies ........................................................ EC 441 (4)
Asset Allocation in Technical Decision Making ...................... EGR 403 (4)
Role of Design Professionals in Society ............................. EGR/BUS 445 (4)
Politics of Food and Agriculture ..................................... FMA 313 (3)
Food Safety and Current Issues ...................................... FST 325 (4)
Environment Law ....................................................... GEO 413 (4)
Studies of a Blue Planet .............................................. GSC 320 (4)
Natural Disasters ....................................................... GSC 350 (4)
Agriculture and International Development ......................... FN/IA 445 (4)
Ethics, Environment and Society ..................................... PHL 330 (4)
Bioethics ................................................................. PHL 433 (4)
Understanding Rationality through Urban Planning ............... URP 302 (4)
Planning Policy Analysis ............................................. URP 334/334A (2/2)
Cities in a Global Economy ............................................ URP 475 (4)

Environmental Factors in Regional Planning ....................... URP 487 (4)

Elective Core Units .................................................... 19-20

Required Support Course
Logic and Computing .................................................. CS/PHL 218 (4)

Elective Support Courses
Select 1 course from the following: ................................... 3-4
Statistics with Applications ............................................ STA 120 (4)
Statistical Methods in Engineering and the Physical Sciences .................................................. STA 309 (3)
Select 1 course from the following: ................................... 4
Ways of Doing: The Industrial Age ..................................... IGE 222 (4)
Principles of Sociology ............................................... SOC 201 (4)

Elective Support Units .................................................. 7-8

Other Requirements
Qualifying Minor
A Qualifying Minor (i.e., a minor in Biological Sciences, Chemistry, Computer Science, Geological Sciences, Physics, Mathematics, Statistics, Comparative Systems Analysis, or Computer Information Systems)

Qualifying Minor Units ............................................... 29-42

Unrestricted Electives .................................................. 8-31
Select a sufficient number of courses so that the total from “Elective Core,” “Unrestricted Support,” “Other Requirements,” “G.E.,” and “Unrestricted Electives” is at least 149 units.

GENERAL EDUCATION REQUIREMENTS

Students should consult the catalog website www.csupomona.edu/~academic/catalog/ for current information regarding this requirement. Unless specific courses are stated under Support Courses, see the list of approved courses under General Education Requirements, Areas A through E.

Area A. Communication and Critical Thinking (12 units)
1. Oral Communication
2. Written Communication
3. Critical Thinking

Area B. Mathematics and Natural Sciences (16 units)
1. Physical Science
2. Biological Science
3. Laboratory Activity
4. Mathematics/Quantitative Reasoning
5. Science and Technology Synthesis

Area C. Humanities (16 units)
1. Visual and Performing Arts
2. Philosophy and Civilization
3. Literature and Foreign Language
4. Humanities Synthesis

Area D. Social Sciences (20 units)
1. U.S. History, Constitution, and American Ideals
2. History, Economics, and Political Science
3. Sociology, Anthropology, Ethnic and Gender Studies
4. Social Science Synthesis

Area E. Lifelong Understanding and Self-development (4 units)
## COURSE DESCRIPTIONS

**STS 201 Introduction to Science, Technology, and Society (4)**
Examines the interrelation among science, technology, and society. History of STS as an interdisciplinary field, and case studies focusing on STS in practice. 4 lecture problem-solving.

**STS 461 Science, Technology, and Society Capstone Seminar (4)**
Intensive study of the historical, social, political, economic, and ethical dimensions of a topic in science or technology. Selection and development of project for STS majors and minors. 4 seminars. Prerequisites: STS 201 and senior standing.

**STS 462, STS 463 Science, Technology, and Society Senior Project (3) (3)**
Implementation of project development in STS 461. Project results presented in a formal report to the campus community. 3/3 field work. Prerequisite STS 461. Open only to STS majors.

## SCIENCE, TECHNOLOGY, AND SOCIETY MINOR

**Peter Ross, Director**

The Science, Technology, and Society (STS) Minor is an interdisciplinary program which integrates knowledge in the natural sciences and in technology as well as in the humanities and social sciences. However, the goals of the STS Minor are quite different from those of the STS Major, and the Minor serves a distinct group of students.

The STS Minor requires science and technology majors to systematically consider the historical, social, cultural, political, and ethical aspects of science and technology. This gives science and technology majors a better understanding of important practical aspects of science and technology, in particular, the complex interaction between science and technology on the one hand and society on the other. Such practical understanding helps put in clearer focus such issues as political influence on science and technology funding and the public understanding of science and technology.

In providing this broadening of perspective on science and technology, the STS Minor prepares science and technology majors to be better sensitive to social needs and to better understand the public’s complex reaction to science and technology. In addition, the STS Minor also facilitates communication across disciplinary standpoints, even across standpoints as diverse as those in the natural sciences, engineering, the humanities, and the social sciences.

In sum, the STS Minor provides science and technology majors with a sense of how science and technology exists in a broader human context. (By contrast the Major opens opportunities for writing- and argument-intensive science- and technology-related careers (such as those in science- and technology-related law and public policy) which are alternative to careers as scientists and technologists.)

### Required

**Introduction to Science, Technology, and Society .STS 201 (4)**

**Select 12 units from the curriculum requirements of a minor in Biological Sciences, Chemistry, Computer Science, Geological Sciences, Physics, Mathematics, Statistics, Comparative Systems Analysis, Computer Information Systems, or Regenerative Studies**

- Philosophy of Science .PHL 483 (4)
- Science, Technology, and Society .STS 463 (4)

### History of Science and Technology

**Select 1 course from the following:**

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
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<tr>
<td>History of Anthropological Theory .ANT 380</td>
<td>4</td>
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<tr>
<td>History and Philosophy of Chemistry .CHM 306</td>
<td>4</td>
</tr>
<tr>
<td>History and Philosophy of Systems Science .CSA 300</td>
<td>4</td>
</tr>
<tr>
<td>History of American Science and Technology .HST 408</td>
<td>4</td>
</tr>
<tr>
<td>The Scientific Revolution .HST 421</td>
<td>4</td>
</tr>
<tr>
<td>Modern Science in World History .HST 423</td>
<td>4</td>
</tr>
<tr>
<td>History of Technology in Music .MU 310</td>
<td>4</td>
</tr>
<tr>
<td>History of Physics .PHY 306</td>
<td>4</td>
</tr>
</tbody>
</table>

### Social and Cultural Studies of Science and Technology

**Select 1 course from the following:**

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plants and Civilization .AGR 311</td>
<td>4</td>
</tr>
<tr>
<td>Beyond Curie: Women in Math .GSC 347</td>
<td>4</td>
</tr>
<tr>
<td>Science and Engineering .EGR/EIS/SCI 475</td>
<td>4</td>
</tr>
<tr>
<td>Gender, Identity and Technology .EWS 425</td>
<td>4</td>
</tr>
<tr>
<td>Visions of Science and Technology .JIG 320</td>
<td>4</td>
</tr>
<tr>
<td>Energy and Society .BS 301</td>
<td>4</td>
</tr>
<tr>
<td>Life Support Processes .RS 301</td>
<td>4</td>
</tr>
<tr>
<td>Organization for Regenerative Practices .RS 303</td>
<td>4</td>
</tr>
<tr>
<td>Sustainable Communities .RS 450</td>
<td>4</td>
</tr>
</tbody>
</table>

### Ethics and Policy of Science and Technology

**Select 1 course from the following:**

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethical Issues in Food, Agricultural and Apparel Industries .AG 401</td>
<td>4</td>
</tr>
<tr>
<td>Genetics and Human Issues .BIO 300</td>
<td>4</td>
</tr>
<tr>
<td>Environment and Society .BIO 304</td>
<td>4</td>
</tr>
<tr>
<td>Computers and Society .CS 375</td>
<td>4</td>
</tr>
<tr>
<td>Ethical Considerations in Technology and Applied Science .EGR 402</td>
<td>4</td>
</tr>
<tr>
<td>Asset Allocation in Technical Decision Making .EGR 403</td>
<td>4</td>
</tr>
<tr>
<td>Role of Design Professionals in Society .EGR/BUS 445</td>
<td>4</td>
</tr>
<tr>
<td>Food Safety and Current Issues .FST 325</td>
<td>4</td>
</tr>
<tr>
<td>Environmental Law .GEO 413</td>
<td>4</td>
</tr>
<tr>
<td>Studies of a Blue Planet .GSC 320</td>
<td>4</td>
</tr>
<tr>
<td>Natural Disasters .GSC 350</td>
<td>4</td>
</tr>
<tr>
<td>Agriculture and International Development .FN/IA 445</td>
<td>4</td>
</tr>
<tr>
<td>Ethics, Environment and Society .PHL 330</td>
<td>4</td>
</tr>
<tr>
<td>Bioethics .PHL 433</td>
<td>4</td>
</tr>
<tr>
<td>Cities in a Global Economy .URP 475</td>
<td>4</td>
</tr>
</tbody>
</table>

Total Units: 36

### ENVIRONMENTAL HEALTH SPECIALIST MINOR

The minor provides Biological Sciences majors, Agricultural Biology majors, and other majors with courses which prepare students for careers in the California Department of Health Services as Environmental Health Specialists. Increasing awareness of pollution and other health-related environmental problems has led to a demand for specialists to enforce and administer laws governing water, food, and air contamination, noise, land use planning, occupational health hazards, and animal vectors of disease. Many job opportunities exist in California for individuals trained as Environmental Health Specialists according to the California Department of Health Services.

The California Health and Safety Code outlines the standards for admission to the state internship program to become a registered
specialist. The minimum educational qualifications are possession of a bachelor's degree from an approved institution with a minimum of 45 quarter units of basic science. The basic science requirement would be met by most students in Biological Sciences and in Agriculture. Students interested in more information may contact Dr. Richard Kaoe or Dr. Lester Young (Horticulture/Plant and Soil Sciences Department), or Dr. John Chan (Biological Sciences Department).

Core Courses

Basic Biology ........................................ BIO 115/115L (5)
or Foundations of Biology ....................... BIO 123/123L (5)
General Chemistry .................................. CHM 121/121L (4)
General Chemistry .................................. CHM 122/122L (4)
Elements of Organic Chemistry ................. CHM 201 (3)
Fundamentals of Physics .......................... PHY 102 (4)
College Algebra ..................................... MAT 105 (4)
Statistics with Applications ................. STA 120 (4)

Units ..................................................... (28)

Support Courses

Required of all students:
Public Administration .......................... PLS 314 (4)
Introduction to Arthropods ................. PLT 233 (4)
or Introduction to Entomology ............... ZOO 426/426L (4)
Basic Microbiology .............................. MIC 201/201 (5)
General Epidemiology ............................ MIC 330 (4)
Units ..................................................... (17)
Select 3 courses from the following:
Applied Microbiology ............................. MIC 310/310L (5)
Water Pollution Biology ..................... BIO 420 (3)
Radiation Biology ................................. BIO 431/431 (5)
Air Pollution Problems ......................... CHM 460 (3)
Public Health Entomology ............... ZOO 435/435 (4)
Units ..................................................... (10-14)
Select 3 courses from the following:
Pesticide and Hazardous Material Laws ........ PLT 303 (3)
Urban Pest Management ...................... PLT 324/324L (4)
Invertebrate Vector Control .................. PLT 342/342L (4)
Postharvest Physiology ..................... PLT 351/351L (4)
Units ..................................................... (11-12)
Total units for the minor ....................... (68-72)

INTERDISCIPLINARY MINOR IN GEOGRAPHIC INFORMATION SYSTEMS

The interdisciplinary GIS Minor was created for Cal Poly Pomona students whose majors include engineering, business, design, science, urban planning, education, agriculture, social sciences, and humanities in an effort to create a GIS-literate campus. The minor serves students who are interested in the application of GIS to their area of knowledge, or who seek to develop their skills in GIS-related areas. GIS technology offers new and powerful ways of combining data, mapping and spatial analysis to support research, management and policy-making. GIS users are trained in spatial modeling and know how to manipulate digital data, create databases, and develop software. The GIS minor provides fundamentals of GIS for students without previous work in GIS, but allows for modifications to the core for students with prior experience.

Components of the program include: data acquisition and manipulation, development of spatial thinking and visualization skills, creation of models and use of analytic methods; programming; problem solving using applied GIS technology; learning to create effective output; process management; GIS theory and ethics; and an interdisciplinary focus.

For more information students may contact Boykin Witherspoon III, Minor Coordinator, Center for GIS Research, (909) 869-6913, or look on the web at www.cgisr.csupomona.edu/

Core Courses

Introduction to Interdisciplinary GIS Studies

ENV/EGR/CLS/SCI 215/215A (4)
or Introduction to GIS ............................. GEO 240/240A (4)
Visual Basic for Geographic Information Systems ... EGR 302/302A (4)
or Computer Cartography ................... GEO 421/421L (4)
Advanced Geographic Information Systems I .......................... GEO 442/442A (4)
Advanced Geographic Information Systems II .......................... GEO 443/443A (4)
Total Core Units .................................. 16

All GIS minors must take at least 12 units outside of their Major in order to be awarded the GIS Minor. These 12 units must approved by the GIS Minor Coordinator.

Electives

All GIS Minors are required to take 12 units in upper division GIS elective courses to complete the program in consultation with the GIS Minor coordinator and the GIS advisor for the student’s department. All electives must have the approval of the GIS Minor coordinator.

Course Descriptions

ENV/EGR/CLS/SCI 215/215A Introduction to Interdisciplinary GIS Studies (3/1)

Introduction to GIS and cartographic principles. Interdisciplinary overview of geographic information system (GIS) applications, and basic computer cartography techniques. Diagnostic assessment of student skills and development of study plans. 3 hours lecture/problem-solving, 2 hours activity.

GEO 240/240A Introduction to Geographic Information Systems (3/1)

Concepts in the framework of geographic information systems. Basic techniques for the computer processing of geographical systems analysis and modeling, 3 hours lecture/problem-solving, 2 hours activity. Prerequisites: GEO 105/105A or permission of instructor.

EGR 302/302A Visual Basic for Geographic Information Systems (3/1)

Logical methods and techniques in algorithm development. The Visual Basic environment and Visual Basic programming. Structure of object oriented programs. Concept of class organization and manipulation. Programming Geographical Information Systems (GIS) related algorithms using Visual Basic and their integration in the GIS environment. 3 hours lecture, 2 hours activity. Pre-requisite: MAT106 or STA120.

GEO 421/421L Computer Cartography (3/1)

Explore the fundamentals of cartographic communication principles, processes, and technology. Obtain basic skills in designing and making effective maps with Geographic Information Systems and current computer technology, including interactive mapping and web based mapping. 3 lectures/problem solving, 1 three-hour laboratory. Prerequisites: GEO 240/240A or consent of instructor.
**GEO 442/442A Advanced Geographic Information Systems I (3/1)**
First course in a two course project based sequence. Technical issues in geographic information, including data structures and applied spatial statistics. Progress toward completion of a research project. 3 hours lecture/problem solving, 2 hours activity. Prerequisites: GEO 240/240A or EGR/ENV/CLS/SCI 215/215A, or consent of instructor.

**GEO 443/443A Advanced Geographic Information Systems II (3/1)**
Second course in a two course project based sequence. Technical issues in geographic information, including data structures and applied spatial statistics. Completion of a research project. 3 hours lecture/problem solving, 2 hours activity. Prerequisites: GEO 442/442A, or consent of instructor.

**INTERDISCIPLINARY MINOR IN INTERNATIONAL STUDIES**
The interdisciplinary International Studies minor was created for Cal Poly Pomona students in any major who want to complement their major degree studies with a self-structured course of study that will enhance their understanding of the world in which they will be living. The minor requires that students participate in at least one program of study outside the United States and that they either demonstrate or gain proficiency in a language other than English equivalent to at least one year of university-level study. Coursework selected for the minor, along with the overseas experience and language acquisition, should help the student gain an appreciation for the history, culture, and social systems in another part of the world.

The minor works closely with the Cal Poly Pomona International Center which offers a wide range of international study programs ranging from intensive courses over a few weeks during a school break to quarter-, semester- and year-long programs at overseas locations. The coursework required includes an introductory course designed in part to help prepare students for the overseas experience and a capstone seminar designed to help students evaluate the overseas experience when they return to campus. The additional coursework is drawn from the many offerings that various departments across campus already provide to their students. Each student will develop an agreement with an International Study Minor adviser about which courses will best serve the student’s interests and needs.

Depending on whether the student is required to learn a completely new language for the minor, the number of units required by the major ranges from 29 (the student is already competent in a second language) to 41 (the student needs to take three quarters of a foreign language at Cal Poly Pomona).

For more information, students may contact the College of Letters, Arts, and Social Sciences Dean’s Office at (909) 869-3500.

<table>
<thead>
<tr>
<th><strong>Core Courses</strong></th>
<th><strong>(5 units)</strong></th>
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</thead>
<tbody>
<tr>
<td>Introduction to International Studies</td>
<td>CLS 205 (2)</td>
</tr>
<tr>
<td>Capstone Seminar in International Studies</td>
<td>CLS 405 (3)</td>
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<table>
<thead>
<tr>
<th><strong>Theme Courses</strong></th>
<th><strong>(12 units)</strong></th>
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<tbody>
<tr>
<td>Select 4 units of course work from each of the following three clusters of courses for a total of 12 units.</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Cultural Courses (select 4 units)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultures in Performance</td>
</tr>
<tr>
<td>Magic, Shamanism and Religion</td>
</tr>
<tr>
<td>History of Japanese Art</td>
</tr>
<tr>
<td>Art of Mexico, Central and South America</td>
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<tr>
<td>Art of the Ancient Near East</td>
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<tr>
<td>Intercultural Communication</td>
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</tbody>
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<table>
<thead>
<tr>
<th><strong>Literature</strong></th>
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<tbody>
<tr>
<td>Literature of the Third World</td>
</tr>
<tr>
<td>Literature of Exile</td>
</tr>
<tr>
<td>20th Century British Literature</td>
</tr>
<tr>
<td>Latin American Women Writers in Translation</td>
</tr>
<tr>
<td>French Civilization</td>
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<tr>
<td>Contemporary France</td>
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</tbody>
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<tr>
<th><strong>Art</strong></th>
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<tbody>
<tr>
<td>Intro to the Literature of the French-speaking World</td>
</tr>
<tr>
<td>German Civilization</td>
</tr>
<tr>
<td>Chinese Culture and Civilization</td>
</tr>
<tr>
<td>Musics of Mexico</td>
</tr>
<tr>
<td>Music Histories of Europe, North and South America</td>
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</table>

<table>
<thead>
<tr>
<th><strong>History</strong></th>
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</thead>
<tbody>
<tr>
<td>History Courses (select 4 units)</td>
</tr>
<tr>
<td>China Since 1800</td>
</tr>
<tr>
<td>Modern India</td>
</tr>
<tr>
<td>South Asia</td>
</tr>
<tr>
<td>Modern Southeast Asia</td>
</tr>
<tr>
<td>Middle East: Ottoman Empire</td>
</tr>
<tr>
<td>Middle East: Problems of the 20th Century</td>
</tr>
<tr>
<td>Colonial Africa</td>
</tr>
<tr>
<td>African Nationalism and Decolonization</td>
</tr>
<tr>
<td>Latin America: Colonial Period</td>
</tr>
<tr>
<td>Latin America: The Era of Nation-Building</td>
</tr>
<tr>
<td>Latin America since 1900</td>
</tr>
<tr>
<td>The Caribbean</td>
</tr>
<tr>
<td>Britain to 1689</td>
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<tr>
<td>Britain since 1689</td>
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<tr>
<td>Medieval Russia</td>
</tr>
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<td>Imperial Russia</td>
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<td>Soviet Union</td>
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<tr>
<td>East Central Europe</td>
</tr>
<tr>
<td>Brazil</td>
</tr>
<tr>
<td>Mexico to 1810</td>
</tr>
<tr>
<td>Mexican History since 1810</td>
</tr>
<tr>
<td>China Since 1949</td>
</tr>
<tr>
<td>Japan to 1868</td>
</tr>
<tr>
<td>Women in Asia</td>
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<table>
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<tr>
<th><strong>Social Science</strong> (select 4 units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthropology of Development</td>
</tr>
<tr>
<td>Language and Culture</td>
</tr>
<tr>
<td>Social Anthropology</td>
</tr>
<tr>
<td>Culture Areas of the World</td>
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<tr>
<td>Economic Development</td>
</tr>
<tr>
<td>Comparative Economic Systems</td>
</tr>
<tr>
<td>Economywide Country Studies</td>
</tr>
<tr>
<td>Legal Aspects of International Business</td>
</tr>
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</table>
Tourism in a Globalizing World ............................. GEO 345 (4)
Geography of Asia ................................. GEO 357 (4)
Geography of Africa ................................. GEO 358 (4)
Europe: Land and People ............................. GEO 359 (4)
Politics of Developing Areas ............................. PLS 342 (4)
Sub-Saharan Governments and Politics ............................. PLS 442 (4)
Latin American Governments and Politics ............................. PLS 444 (4)
Middle Eastern Governments and Politics ............................. PLS 446 (4)
Russian Republic ........................................ PLS 447 (4)
East Asian Governments and Politics ............................. PLS 448 (4)
Southeast Asian Governments and Politics ............................. PLS 449 (4)
Multicultural Psychology ...................................... PSY 325 (4)
Social Change ............................................. SOC 340 (4)

**Foreign Language (0–12 units)**
Students must demonstrate competence in a language other than English at the level expected of a student who completed the first three quarters of language study at Cal Poly Pomona. The Foreign Language program may test the student for proficiency or the student may complete the requirement by coursework. Language proficiency is not limited to languages offered at Cal Poly Pomona. Students who are not U.S. citizens and who are not native-English speakers will be deemed to have met this requirement upon completion of ENG 104.

**Overseas Study (4–12 units)**
Students are required to participate in one of the Cal Poly Pomona international study programs or one of the CSU system-wide international study programs. Other international study programs may be approved as equivalents.

**Electives (0–8 units)**
Students who earn 12 units in overseas study are not required to take additional courses. Students who earn fewer than 12 units in overseas study should select additional course offerings from among the Cultural, History, and Social Science course offerings so that the total of Overseas Study and Electives is equal to 12 units. However, 4 units earned in overseas study is a minimum requirement for the minor.

**PHYSIOLOGY MINOR**
The Physiology Minor can be taken by students from any department in the University but it is particularly appropriate for students with the following majors: Animal Science (AS), Psychology (PSY), Biology (BIO), Biotechnology (BTC), Chemistry (CHM), Electrical and Computer Engineering (ECE Biomedical Engineering), Foods and Nutrition (FN), Kinesiology and Health Promotion (KHP), Biology (BIO), Microbiology (MIC), and Zoology (ZOO). It is intended to assist students interested in physiology to discover and prepare for careers in: medicine; dentistry; veterinary science; high school teaching; graduate study in general or comparative physiology, kinesiology, exercise physiology or physiological psychology; and, allied health professions such as human and animal nutrition, exercise and health counseling, biomedical engineering, and domestic animal reproduction. It will do this by exposing students to the diversity of disciplines and careers available to people with an understanding of physiology. It will also provide them with a broad basic background and then permit them to tailor a program of advanced courses to suit their general interests and career goals. The program is administered by a steering committee composed of the following individuals: S. Bassin (KHP), D. Clark (ECE), E. Cogger (AVS), D. Lewis (HNFS), N. Harkey (BHS), D. Hoyt (BIO/ZOO), P. Mobley (CHM), and S. Eskandari (BIO/ZOO). Students interested in more information should contact Dr. Sepehr Eskandari.

**Requirements**
(Prequisites listed in parentheses)
Assumed entry level skills: high school chemistry and algebra.

**Core (required of all students)**
- Basic Biology (none) ................................. BIO 115/115L (5)
- or Foundations of Biology ............................ BIO 123/123L (5)
- General Chemistry (none) ............................ CHM 121/121L (4)
- General Chemistry (CHM 121/121L) ............................ CHM 122/122L (4)
- Statistics with Applications ............................ STA 120 (4)
- Units .................................................. (17)

**Restricted Electives**
- Anatomy (select one course)
  - Human Anatomy (BIO 115/115L)
  - or BIO 121/L, 122/L and 123/L ............................ ZOO 234/234L (4)
  - Comparative Vertebrate Anatomy (ZOO 138/138L)
  - or BIO 121/L, 122/L and 123/L ............................ ZOO 451/451L (5)
  - Anatomy & Physiology of Domestic Animals
    - (BIO 115/115L) ................................. AVS 350 (5)
    - Neuroanatomy (BIO 115/115L)
    - or BIO 121/L, 122/L and 123/L ............................ BIO 426/426L (5)
    - Units .................................................. (4-5)

- Physiology (select one course)
  - Human Physiology (BIO 115/115L) ............................ ZOO 235/235L (4)
  - Animal Physiology (BIO 211/L, BIO 310, CHM 123/L, PHY 123/L, ZOO 138/L)
  - or ZOO 201/L or ZOO 238/L ............................ ZOO 428/428L (5)
  - Units .................................................. (4-5)

**Chemistry**
- Elements of Organic Chemistry
  - or equivalent (CHM 122) ............................ CHM 201 (3)
- Elements of Organic Chemistry Lab (CHM 122) ............................ CHM 250L (1)
- Units .................................................. (4)

- Total Units, Restricted Electives .................................................. (12-14)

**Advanced Physiology Courses**
One or more courses from each of the following four clusters totaling at least 20 units. Two courses must be from outside the major school.

**Physicochemical Principles**
- Elements of Biochemistry (CHM 201, CHM 250L) ............................ CHM 321 (4)
- Biochemistry (CHM 315, CHM 317) ............................ CHM 327 (4)
- Biochemistry (CHM 327) ............................ CHM 328 (4)
- Biochemistry (CHM 328) ............................ CHM 329 (4)
- Elements of Physical Chemistry
  - (MAT 116, CHM 123, PHY 133) ............................ CHM 304 (4)
- Elements of Physical Chemistry (CHM 304) ............................ CHM 305 (3)
- Thermodynamics (PHY 132) ............................ ME 301 (4)
- Thermodynamics (ME 301, MAT 215) ............................ ME 302 (4)
- Fluid Mechanics (ME 215, PHY 132) ............................ ME 311 (3)
- Fluid Mechanics (ME 301, ME 311) ............................ ME 312 (4)
- Cellular Physiology (CHM 201) ............................ BIO 435/435L (4)
- Advanced Cell Biology (BIO 435, CHM 327)
  - or consent) ............................................. BIO 535 (4)
Biophysics (PHY 123 or consent) ....................... PHY 410 (4)

**Physiology**

Neuroscience (CHM 201/250L or CHM 314/317L) . BIO 424 (4)
Physiological Ecology (ZOO 428/428L or consent of instructor) .................. ZOO 440/440L (4)
Endocrinology (CHM 327, ZOO 428/428L and/or consent) .................... BIO 520/520L (4)

**Physiological Systems**

Physiological Psychology (BHS 204, 205, PHY 202, 203) . PSY 303 (5)
Mammalian Endocrinology (AVS 350) .................. AVS 412 (4)
Physiology of Lactation (AVS 350 and AVS 412) . AVS 413 (3)
Reproductive Physiology of Food Animals (AVS 350 or ZOO 428/428L) ................ AVS 414 (4)
Avian Physiology (none) .................. PSY 431 (3)

**Biomedical Instrumentation and Measurements**

Biomedical Instrumentation and Measurements (BIO 115/115L, ECE 323 or ECE 333 or consent) . ECE 435 (3)
Biomedical Instrumentation and Measurements Laboratory (ECE 435 concurrent) . ECE 485 (1)

**Nutrition**

Nutrition .................. FN 235 (3)
Advanced Nutrient Metabolism I (CHM 321, FN 235, ZOO 235/235L) .................. FN 433 (4)
Advanced Nutrient Metabolism II (FN 433) .................. FN 434 (4)
Medical Nutrition Therapy I (FN 434) .................. FN 443 (3)
Medical Nutrition Therapy II (FN 443) .................. FN 444 (3)
Animal Nutrition (CHM 321) .................. AVS 402 (4)
Ruminant Nutrition (CHM 321) .................. AVS 403 (4)
Advanced Nutrition (FN 434) .................. FN 533 (3)
Recent Advances in Nutrient Metabolism (consent) .................. FN 535 (2)
Nutrition Through the Life Cycle (FN 433) .................. FN 536 (3)
Biological Control Systems (upper division course in control systems) .................. EGR 588 (4)

**Ergonomics**

Physiology of Exercise (ZOO 235/235L) .................. KIN 303/303L (3/1)
Lifespan Motor Development (Junior or Senior standing) .................. KIN 312/312A (3/1)
Growth, Aging, and Physical Activity .................. KIN 365/365A (3/1)
Biomechanical Kinesiology (KIN 302) .................. KIN 402/402L (3/1)
Physiology of Exercise II (KIN 303/303L) .................. KIN 403/403L (3/1)
Motor Learning & Human Performance (KIN 303/303L, 425/425A) .................. KIN 430/430L (3/1)
Sports Medicine (KIN 303/303L) .................. KIN 455 (4)
Exercise Metabolism and Weight Control (KIN 303/303L, FN 205 or FN 235 and FN 236L) .................. KIN 456 (3)
Advanced Motor Learning & Human Performance (KIN 430/430L) .................. KIN 580 (3)
Advanced Motor Development (KIN 312/312A) .................. KIN 583 (3)

Total Units—Advanced Courses .................. (20)
Total Units—Minor .......................... (49-51)

**QUANTITATIVE RESEARCH MINOR**

The Quantitative Research Minor may be taken by students having any major in the University other than Mathematics. This is particularly appropriate for students having majors in the following areas: Operations Management, Marketing Management, Agricultural Business Management, Animal Science, Psychology, Sociology, Economics, Political Science, Kinesiology, Biological Sciences, Urban and Regional Planning. The minor is intended to prepare students to perform quantitative analyses within their area of interest by providing the working knowledge required in statistics, principles of experimental design, survey and data analysis techniques. This includes learning to understand and use some of the statistical software packages available on computers. Students are expected to complete a project in their major having a significant quantitative component.

The project is jointly directed by the Statistics Coordinator and a faculty advisor selected from the student's own department. Through such experience our graduates become more able and prepared to perform quantitative studies in their chosen field of employment. For more information students may contact any of the following reference sources: Dr. D. S. Gill (Statistics Coordinator), Dr. John Korey (Political Science), Dr. David Horner (Psychology and Sociology), Dr. Ralph Miller (Technology and Operations Management), Dr. Vernon Stauble (Marketing Management), Dr. Richard Wilson (Urban and Regional Planning), Dr. David Moriarty (Biological Sciences), Dr. Anne E. Bresnock (Economics), Dr. Wanda Rainbolt (Kinesiology and Health Promotion) or Nancy Merlino (Food Marketing and Agribusiness Management).

**Requirements**

**Core**

Statistics with Applications .................. STA 120 (4)
Sampling Survey Methods .................. STA 310 (4)
Units .................................................. (8)

**Intermediate (Choose one sequence)**

Managerial Statistics .................. TOM 302 (4)
Advanced Managerial Statistics .................. TOM 380 (4)

Data Management for Agribusiness .................. FMA 375 (4)
Advanced Managerial Statistics .................. TOM 380 (4)

**Statistics for Behavior Sciences**

Statistics in the Behavioral Sciences .................. BHS 307/307A (3/1)
Policy Analysis and Program Evaluation .................. PLS 417/417A (3/1)

**Statistical Computing**

Nonparametric Statistics .................. STA 420 (4)

Statistics Computing .................. STA 210 (4)

Biometrics .................. BIO 411 (3)

Planning Research Methods I .................. URP 331/331L (4/2)
Planning Research Methods II .................. URP 332/332L (4/2)

Econometrics .................. EC 421 (4)

Units .................................................. (7-12)

**Applied Methods (Choose one course from each group)**

**GROUP I**

Marketing Research I .................. IBM 408 (4)
Real Estate Market Analysis .................. FRL 483 (4)
Survey Research .................. SOC 433/433A (3/1)

**GROUP II**

Project Design and Development .................. TOM 460 (4)
Experimental Psychology: Research, Design and Methodology .................. PSY 433/433L (4/1)
ANNOVA and Design of Experiments .......... STA 435 (4)
Units .................................................. (8-9)

Project
Students will do a quantitative research project in their major field of study. .......... (4)

Total units for the minor ........................................ (27-32)

TOTAL QUALITY MANAGEMENT MINOR
The Total Quality Management (TQM) Minor may be taken by students having any major in the University. It is particularly appropriate for students having majors in the following areas: Technology and Operations Management, Industrial and Manufacturing Engineering, Management and Human Resources, International Business and Marketing. The Minor is intended to allow students to gain the knowledge and skills necessary for effective application of quality management techniques in manufacturing, service, and not-for-profit organizations. The Total Quality Management Minor will help fill the need for graduates, especially from business and engineering, who are trained in the concepts, techniques, tools and methods of analysis used for the continuous improvement of product, service, and process quality. Computer-based approaches are used wherever they are available and appropriate. For more information, students may contact any of the following faculty members: Dr. John Knox (Operations Management), Dr. Peggy Snyder (Management and Human Resources), and Professor Phil Rosenkrantz (Industrial and Manufacturing Engineering).

Core Requirements

Prerequisites (12-26 units)
Completion of one of the following prerequisite options is required. In most instances, the prerequisites listed in an option package are part of the existing curriculum for the student in the indicated academic program area.

OPTION 1: (Business, Engineering Technology, and some Science majors.
Also, all majors not included in Options 2 and 3 below)
Statistics with Applications ................. STA 120 (4)
Operations Management ..................... TOM 301 (4)
Managerial Statistics .......................... TOM 302 (4)

OPTION 2: (Engineering, and some Science majors)
Analytic Geometry and Calculus I .......... MAT 114 (4)
Analytic Geometry and Calculus II .......... MAT 115 (4)
Analytic Geometry and Calculus III ........ MAT 116 (4)
Calculus of Several Variables I ............. MAT 214 (3)
Statistical Methods in Engineering and the Physical Sciences ................. STA 309 (4)
Engineering Probability and Statistics ....... IME 312 (4)

OPTION 3: (Mathematics majors)
Analytic Geometry and Calculus I .......... MAT 114 (4)
Analytic Geometry and Calculus II .......... MAT 115 (4)
Analytic Geometry and Calculus III ......... MAT 116 (4)
Calculus of Several Variables I ............. MAT 214 (3)
Calculus of Several Variables II .......... MAT 215 (3)
Applied Probability Theory .................. STA 241 (4)
Applied Statistics ................................... STA 341 (4)

Core Requirements (16 units)
(Note: OM majors are required to substitute a course outside their major, with minor advisor approval, for TOM 401.)

Processes and Measurement ............................ IME 280 (4)
Total Quality Management ............................ TOM 401 (4)
Quality Management ....................................... TOM 435 (4)
or Quality Control by Statistical Methods ....... IME 415 (4)
Total Quality Management Implementation ...... MHR 417 (4)

Directed Elective Courses (8 units)
Production and Inventory Management .......... TOM 432 (4)
Materials and Inventory Management ............ TOM 433 (4)
Purchasing Management .............................. TOM 434 (4)
Operations Management in Services ............ TOM 453 (4)
Just-In-Time Production .............................. TOM 455 (4)
Project Design and Development ................ TOM 460 (4)
First Line Management ................................ MHR 313 (4)
Training and Development ........................ MHR 405 (4)
Advanced Organizational Behavior ............ MHR 438 (4)
Design of Experiments .............................. IME 435/435L (3/1)
Fundamentals of Human Factors
Engineering/Laboratory ............................ IE 225/225L (3/1)
Principles of Productivity Engineering ........ IE 392 (3)
Reliability Concepts and Techniques ............ IE 419 (3)
Human Engineering in Design/Laboratory .... ME 438/448L (2/1)
Geometric Dimensioning and Tolerancing/Laboratory .... MFE 323/323L (2/1)
Intro to Computer Integrated
Manufacturing/Laboratory .......................... MFE 450/450L (3/1)
Productivity Engineering ............................ MFE 484 (3)
Advanced Human Factors in Engineering Design . EGR 539 (4)
Nondestructive Evaluation I ............. ETP 437/437L (1/1)
Nondestructive Evaluation II .............. ETP 438/438L (1/1)
Analysis of Variance and Design of Experiments STA 435 (4)

Total Core and Elective Units Requied .................. (24 units)
ATHLETIC DEPARTMENT

Brian Swanson, Director of Athletics
Tracee Passeggi, Associate Director of Athletics

Mike Ashman
Paul Caliguiri
Paul Helms
Greg Kamansky
Sandy Kriezel

Ruem Malasarn
Jim Sackett
Paul Thomas
Scott Tsuji
Rosie Wegrich

The Department of Intercollegiate Athletics offers opportunities for men and women in a wide variety of sports, which include (m) baseball, basketball, cross country, soccer, tennis, track and field and (w) volleyball. The University is a member of the National Collegiate Athletic Association (NCAA), Division II and competes in the California Collegiate Athletic Association (CCAA) conference. These opportunities are open to all qualified students. The University has gained National and International recognition from the performances of its many outstanding athletic teams.

Mission Statement

The mission statement for the Department of Intercollegiate Athletics is an integral part of the educational environment of the total university which allows the student to develop mental, physical, social, and emotional discipline, to develop the ability to work with others, and to enhance decision-making and leadership skills. Intercollegiate Athletics can also serve as a university focal point for public relations and social interaction.

Course Descriptions

KIN 181–195 Competitive Athletics (2)
May be taken by those students who compete on an intercollegiate athletic team and may be repeated for additional credit as long as normal academic progress is maintained.

181 Intercollegiate Basketball (Women)
182 Intercollegiate Baseball
183 Intercollegiate Basketball (Men)
184 Intercollegiate Soccer (Women)
185 Intercollegiate Cross Country (Men)
186 Intercollegiate Soccer (Men)
190 Intercollegiate Tennis (Men)
191 Intercollegiate Track and Field (Men)
192 Intercollegiate Volleyball (Women)
193 Intercollegiate Cross Country (Women)
194 Intercollegiate Tennis (Women)
195 Intercollegiate Track and Field (Women)