Appendix II

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IIA. Background Information Relative to the Institution

1. General Information

Name of institution: University of California, Riverside. (Legal name: The Regents of the University of California.)

Chief executive: Dr. France A. Córdova, Chancellor. 4148 Hinderaker Hall, University of California, Riverside, CA 92521.

Name of person submitting the completed questionnaire: Dr. Reza Abbaschian, Dean, Bourns College of Engineering, A342 Bourns Hall, University of California, Riverside, CA 92521.

2. Type of Control

The University of California, Riverside, is a publicly controlled institution of higher education and a non-profit 501(c)(3) corporation.

3. Regional or Institutional Accreditation

	Initial	Recent
American Chemical Society	1959	2004
Association of American Medical Colleges and American Medical Association	1977	2005
Commission on Teacher Credentialing	1959	1996 (next is expected in 2007-08)
Western Association of Schools and Colleges	1956	In progress through 2009
Graduate School of Education School Psychology Program	2004	2004
Graduate School of Management by AACSB International	2003	2003

4. Faculty and Students

Table II-1 presents faculty and student counts for the fall 2005 term. For full-time faculty, the table includes professors whose appointments are split between instruction and research (I&R) and organized research (OR). If I count only the I&R portion, we will end up with a large number of part-time faculty. UCR has a large component of agriculture-related faculty, paid by

state OR funds. Many UCR faculty have split I&R and OR appointments. The OR piece only has research responsibilities.

Table II-1. Faculty and Student Count for Institution
School Year: 2005-06

	HEAD COUNT		FTE (see Note 2)	TOTAL STUDENT CREDIT HOURS
	FT	PT		
Tenure Track Faculty	608	2	609.0*	
Other Teaching Faculty (excluding student assistants)	136	105	189.0	
Student Teaching Assistants	0	744	325.0	
Undergraduate Students	14,128	443	14,351.7	207,440.5
Graduate Students	1,964	38	1,989.5	26,326.0
Professional Degree Students	49		49.0	1,275.0

1. Data should be provided here for the fall term immediately preceding the visit.

2. For student teaching assistants, 1 FTE equals 20 hours per week of work (or service). For undergraduate and graduate students, 1 FTE equals 15 credit-hours per term of institutional course work, meaning all courses--engineering, humanities and social sciences, etc. For faculty members, 1 FTE equals what your institution defines as a full-time load.

   *Includes total FTE of the faculty member (instruction and research).

5. Mission

UCR's mission statement is as follows: The University of California, Riverside, is a research university committed to the creation and transmission of knowledge at the highest level, and to the translation of that knowledge for the public good. Our comprehensive programs and services, excellent faculty and staff, and vibrant and attractive physical environment are designed to: provide a high quality learning environment for undergraduate and graduate students; advance human knowledge and accomplishment through research and scholarship; enhance the public good through community service and initiatives; seek preeminence among U.S. research universities, recognizing UCR's quality in every area.

Superimposed over this mission are seven strategic goals articulated by Chancellor France Córdova:

1. To enhance UCR's reputational rankings: UCR will have the profile of an AAU member university
2. To invest in areas of strength: UCR will be recognized for its distinction among all research universities in selected areas which exhibit quality and momentum

3. To expand opportunities for learning and personal growth for all students, undergraduate and graduate: UCR will become a campus of "first choice" for applicants, and students will have a successful experience at UCR
4. To reshape the curriculum: UCR will build on the diversity of its students and the distinction of its faculty, and connect the curriculum to the vision of UCR as an AAU institution
5. To diversify our faculty, staff and graduate population: UCR will be a preeminent research university that has diversity as one of its measures of distinctiveness
6. To build professional schools: UCR will offer expanded professional education in areas that respond to the needs of the state and region and that help to stimulate a knowledge-based economy
7. To forge closer ties with the community: UCR will organize and coordinate with others to achieve common goals for prosperity and sustainability of the Inland Empire through technology transfer, attraction and retention of highly skilled jobs and industries, and responsiveness to regional issues

The vision and mission of the Bourns College of Engineering is to become a nationally recognized leader in engineering research and education. Our mission is to:

1. Produce engineers with the educational foundation and the adaptive skills to serve rapidly evolving technology industries.
2. Conduct nationally recognized engineering research focused at providing a technical edge for the U.S.
3. Contribute to knowledge in both fundamental and applied areas of engineering.
4. Provide a diverse curricula that will instill our students with the imagination, talents, creativity and skills necessary for the varied and rapidly changing requirements of modern life and to enable them to serve in a wide variety of other fields that requires leadership, teamwork, decision making, and problem solving abilities.
5. Be a catalyst for industrial growth in the Inland Empire.

6. Institutional Support Units

This section describes support resources available specifically to engineering students or to all undergraduates at UCR. Section 6.A addresses computing resources at the campus, college, departmental, and lab levels. Section 6.B describes the Science Library. Section 6.C describes the Career Center and the Bourns College of Engineering's own placement programs. Section 6.D describes the Honors program, and Section 6.E describes the Learning Center.

6.A Computing

Computer facilities and services are available from several sources for use by the programs of The Marlan and Rosemary Bourns College of Engineering and its students, faculty, and staff:

1. Campus-wide Computing and Communications (C&C) unit, managed by a full-time professional staff.

2. The College, through its programs of Chemical/Environmental Engineering, Computer Science and Engineering, Electrical Engineering, and Mechanical Engineering, and its Research units.

Details of the facilities and their support follow:

Computing and Communications (C&C)

The C&C unit as a whole (which includes Academic Computing, Institutional Computing, Microcomputing, and Communications) is under the direction of an Associate Vice-Chancellor, who reports to the central administration. The Academic Computing, Microcomputing, and Communications sub-units have primary responsibility for providing network access and general computing facilities and services to the UC Riverside campus. They provide:

- Microcomputer facilities in labs at various campus locations, utilizing PCs and Macintosh computers. These may be used on a scheduled basis for campus courses, as well as on a drop-in basis. Access hours are posted and, during these times, lab assistance and software check-out are available.
- Access to the computers of the San Diego Supercomputing Center, available to all campus researchers, with the financial support of the National Science Foundation, through the Academic Computing sub-unit.
- Support and maintenance of the campus computer networks and world-wide Internet access via the CalREN2 regional gigabit network. All Bourns College of Engineering computing facilities have access to these services.
- On-campus wired and wireless connectivity. Most of the campus is "wired for wireless," enabling portable computers to connect to the network. Additionally, the campus network backbone consists of 10 GB fiber-optic connections, with a minimum of 1 GB capacity to each building on campus. The campus has more than 500,000 feet of fiber-optic conduit, which enables the addition of fiber connectivity essentially on demand.
- Campus-wide site licensing for various software packages.
- Consultation on systems, statistical computing, microcomputing, and instructional technology.
- A microcomputing support group.

Computing and Communications, in conjunction with the UCR Office of Instructional Development, operates media and technology in the classrooms at UCR. All UCR classrooms are designed to Fundamental Classroom Standards established by the Classroom Technology Advisory Group. These standards are:

- Classrooms must contain the capability to present materials from a wide variety of sources, including (at a minimum) VHS video, DVD, a personal computer, and the Internet.
- Classrooms must contain a chalkboard or whiteboard that is available and viewable at the same time digital or analog presentations are underway.

- Classrooms must contain a combination of LCD projectors and/or lighting controls that allow students to take notes and view presentation material at the same time.
- Classrooms must be "self service" thus allowing instruction to occur without the aid of student operators and without the delivery of equipment.
- Based on the academic discipline, sound systems and data projection resolution requirements may drive certain classroom minimum standards.

All classrooms are equipped with a multimedia controller, maintained by Computing and Communications, for operation of a laptop computer, projector, and audio equipment. Internet connectivity is via wireless network. Each controller has a "Help" button for the instructor to use if there is a problem with the equipment. A help desk is staffed full time, and at least one field technician is available on campus during instructional hours. Either the help desk (working remotely) or the field technician (in the classroom) can quickly resolve any problem that occurs. In a survey (most recently conducted in 2005), 95.2% of instructors responded that UCR's available classroom technology either "Completely" or "Mostly" met their pedagogical needs.

UCR has just implemented "clicker" technology in its classrooms. Clickers (known also as Personal Response Systems or PRS) are an emerging technology that allows real-time interactions between the instructor and their students. The interactions are usually in the nature of queries by the instructor with students responding electronically to those queries. The student responses are digitally collected both as a group and individually and the information (data) reflects the individuals' and/or group's consensus to the queries. These data can be immediately displayed as visual feedback, not only to the instructor but also to the queried audience. Information obtained in this way can be manipulated pedagogically and administratively via statistical analysis of the queried data to support programmatic goals of a course, a department or a campus wide initiative.

In actual use on this campus this technology has been shown to:

- Increase attendance (sometimes dramatically)
- Coax participation from normally non-participative students
- Create a more engaging lecture environment
- Computing and Communications has partnered with several academic departments to pilot the use of this technology. After three successful pilot programs, C&C has now equipped all UCR General Assignment classrooms with the hardware and software necessary to utilize this technology.

This technology is new and just now being adopted by instructors. It could become an excellent resource for capturing data for measurement of course objectives and program outcomes in the future.

Computing and Communications has taken a lead role in providing high-performance computing in support of the campus research enterprise. Three programs are under development:

1. A centrally managed, standardized/dedicated cluster of processors, in which researchers pay an annual fee for essentially unlimited use.

2. A collaborative computational cluster, in which each PI can buy a certain amount of hardware, which Computing and Communications with manage. The PI has priority access to the equipment that he or she acquired, plus access to the entire cluster as available.
3. A high-performance computer. The campus (Computer Science and Engineering Department) has a proposal pending now for a Cray system.
4. Departmentally maintained clusters, centrally managed.

Computing and Communications competes in the regular campus budget process for the funding of its permanent staff positions and its equipment purchases. It is also the principal recipient of Instructional Use of Computing funds, which are allocated to the campus annually by the UC Office of the President for the operation, support, and maintenance of computing resources. Although there may be quotas assigned, the campus community is not charged for the bulk of these computing services. Research programs supported by grants are assessed recharges for computing time and consultation services.

While all of the above services and facilities are available to the general campus community, the supported computing labs tend to be crowded and in heavy demand, limiting accessibility except for scheduled lab periods. The programs in engineering make prescribed use of only one of them – a 35-station PC Laboratory in Mathematics (Sproul Hall 2225) used for Matlab computing assignments within a linear algebra course required in the Computer Science program. While it continues to maintain a cooperative relationship with the campus C&C unit, the College provides all of its own computing resources, and is dependent upon C&C only for intra-campus and Internet network access.

Bourns College of Engineering

The computing facilities used by the Bourns College of Engineering are owned and managed by the College and its sub-units. Commodity PCs are now the machines of choice for most of the computing tasks, including instruction, office work and network service. The research laboratories have a variety of workstations (Sun, DEC, SGI) appropriate for their specialized requirements.

Systems administration for the College is handled primarily within its component units. Each department has at least one full-time professional systems administrator and several part-time student assistants. These groups collaborate closely to manage and coordinate their own facilities as well as the integrated computing facilities of the College, such as the networking infrastructure. The systems staff for Chemical/Environmental and Mechanical Engineering also has responsibility for the administrative computing facilities for the Dean's office and Student Affairs.

The Center for Research in Intelligent Systems (CRIS), one of the research units of the College of Engineering, promotes interdisciplinary research for developing computer systems that are flexible, adaptive, and intelligent. Its Visualization and Intelligent Systems Lab (VISLAB) computer facility employs one full time administrative assistant and one part-time system administrator.

The research unit CE-CERT (College of Engineering Center for Environmental Research and Technology) employs one full-time programmer/analyst and several part-time student assistants to perform computer system administration. Further, CE-CERT employs a full-time development engineer to assist staff and students with computer interfacing to analytical instruments and data acquisition hardware and software, in connection with laboratory experiments for some of the upper division engineering courses and student projects.

Listings and descriptions of the College computing facilities follow. While they are listed in various categories, they are all interconnected via local networks and routing hubs, and may be accessed from anywhere (including off-campus) provided that the user has an appropriate account authorization, and is using a secure shell.

College Networking Infrastructure

Bourns Hall houses the Department of Mechanical Engineering, the Department of Chemical and Environmental Engineering (including Bioengineering), and the Dean's Office. Engineering Building II opened in 2005 and houses the Department of Computer Science and Engineering and the Department of Electrical Engineering.

The buildings a have state-of-the-art cabling infrastructure which is designed around optical fiber connections between all thirteen wiring closets. Every lab and office has multiple connections to the network with enhanced category-5 unshielded twisted pair cabling; in addition multiple office and labs have optical fiber connections as well. Essentially every computer and printer belonging to the College (approximately 900 computers in total) is connected to the College's Ethernet-based network infrastructure. The core of the network consists of a pair of redundant Cisco Catalyst 6500 routers, each capable of forwarding 720 million packets per second. These connect to a combined distribution/access layer comprised of stacks of Cisco Catalyst 3750 switches, with a combined port count in excess of 2600 ports including gigabit and power over Ethernet ports. In addition to the wired networking ports, the campus 802.11 wireless network provides coverage to nearly all parts of the engineering buildings, and the rest of campus.

The core network for the College is connected to the UCR campus backbone through a pair of 10 gigabit fiber optic connections. The campus backbone has recently been updated with Cisco Catalyst 6500 enterprise switches, which provide network connections to more than 50 buildings. Off-campus networking is provided by 6 gigabit connections into the Cenic network.

Department of Computer Science and Engineering Computing Facilities

The Department of Computer Science and Engineering maintains servers and teaching labs to support CS, CE, and EE courses, as well as a number of service course in the computing area.

Servers are primarily rack mount 1U servers with between 1 and 8 GB of RAM, and processors that range between 2.4-3.0 GHz Intel Xeons, to 2.0 GHz dual core Opterons. These servers are connected to UPS to provide clean power and provision for graceful shutdown in an emergency, and are monitored 24/7 for network availability and service provision. All of them are remotely

accessible via protocols supported by their operating systems and are additionally manageable via remote console. These servers run a variety of operating systems and provide a range of services as noted below.

There are 3 additional storage servers: 1 FAS 250 Network Appliances Filer with 1 TB of disk space, used to store critical files, and two RAID units running with capacities of 6.4 and 4.0 TB respectively.

Servers running CentOS Linux provide web, email (IMAP and POP), FTP, SQL database, DNS, DHCP, authentication, printing, centralized system logging, rdate, and disk backup services. Quarterly backups are maintained offsite.

Servers running Windows Server 2003 provide domain services and remote login capability via terminal services for instructional purposes. Out of seven servers, two are domain controllers with mirrored root drives.

A 4-way 2.0 GHz Opteron Compute Server with 8 GB of RAM running CentOS Linux provides a complement of free Unix software utilities for software development, productivity, etc, as well as remote desktop services using the NX protocol. There are two secondary compute servers with roughly half the computational resources of the primary server.

Except for the Linux compute servers and public Windows 2003 terminal servers, only system administrators may log in to the other Windows and Linux servers. Any CS student or student taking a CS service course may login (over the network) to the compute servers, either via SSH, or using the NX protocol.

The Computer Science and Engineering Department has seven instructional labs. All but one (in EBU II, room 226) are reserved at least some portion of hours during the weekdays for scheduled labs associated with all lower and upper division Computer Science classes or service courses. All students taking CS courses have 24 hour, 7 day access to the CS computing labs.

Instructional labs are located in EBU II, rooms 127, 129, 132, 133, 135, 136, and 226. PCs in these labs run Linux as their local operating system and access Windows applications via Terminal Services. A full range of free software is provided under the Linux operating system, as well as proprietary software for specific courses such as Maya and Renderman for graphics courses and Xilinx, Cadence, and Synopsys software for embedded systems courses. Windows Terminal servers provide access to software such as Aldec Active HDL for embedded systems courses and Microsoft Visual Studio 2005 for programming courses. Labs are equipped with 24 PCs and an HP networked laser jet printer.

Department of Chemical and Environmental Engineering Computing Facilities

Major computing resources for the Department of Chemical and Environmental Engineering are summarized below. The new Bioengineering program currently shares these resources but will develop its own as it evolves into a free-standing department.

- **Student Lab - Bourns Hall B255**. This is a general-purpose student lab containing about 35 PCs running Windows XP. A variety of software is available for word processing,

spreadsheets, mathematics, computer aided drafting (CAD), engineering applications, and Internet access. Students can access the Unix servers to read e-mail and run large computing jobs. The lab also contains a laser printer and a color flatbed scanner. Access to the room is provided 24 hours a day, 7 days a week through card access.

- **Research**. A number of PCs and Unix workstations are in use by researchers and faculty for a variety of purposes, including interfacing with such equipment as a gas chromatograph and a spectrophotometer. Software such as LabView is used for data acquisition and process control.
- **Server machines for Chemical/Environmental and Mechanical Engineering - Bourns Hall A344.** A variety of servers ranging from Single to Quad Processor Intel Pentiums, as well as Sun SPARCs, and a NetApp are utilized. Operating systems used include Windows 2003, Sun Solaris, and FreeBSD. Their functions include:
    - Compute Servers for general purpose applications such as e-mail, MatLab, and printing.
    - File servers for the storage of user data files
    - E-mail and user authentication servers
    - Web server
    - Backup server
    - Card access server
    - Log server

Department of Electrical Engineering Computing Resources

The integrated network in the Bourns College of Engineering offers one of the nation's most advanced computing environments to the faculty, staff and students of the College. The network provides ultra-performance workstations for educational purpose in course-related research and project.

The fully-integrated network maintains 189 desktop workstations in 6 computing labs that are open to all engineering students. All of these labs are accessible to students 24 hours a day, 7 days a week. Windows XP, 2003 Server, Linux, Unix, and Solaris are all supported operating systems. It also allows the students to access many course-related applications and centralized personal folders, e-mails, printers, and other services on the network. People can also reach their personal servers or common shared folders on the network from any other workstation off campus.

The network operates on the TCP/IP protocol with a connecting speed ranging from 100 to 1000 mega-bit-per-second and some Power Over Ethernet (POE). All the switches in the building are connected at 1 gigabit fiber connection. Connection between the Bourns College of Engineering and Engineering Unit II buildings are based on 10 gigabit fiber and 10 gigabit wide-area-network (WAN) link. Wireless Ethernet is available in student lounges, offices, labs, and other locations in the College of Engineering buildings.

The computing environment of the College is fully combined with a broader group of networks that ties the entire country and the globe together. The students of the Bourns College of

Engineering have the privilege of taking advantage of the state-of-the-art technology in advancing their learning endeavor and research experience at the University.

The Electrical Engineering Department also operates six laboratories for student use:

- Engineering II Room 121: Circuit & Control Systems.
- Engineering II Room 125: Embedded Systems & Logic Design.
- Engineering II Room 126: Advanced Systems & Senior Design.
- Engineering II Room 128: Communication & Intelligent Systems.
- Engineering II Room 137: Electronics & Prototyping Shop.
- Engineering II Room 234: Computer Lab.

The labs are equipped with oscilloscopes, digital multimeters, function generators, power supplies, and desktop computers, with a quantity of 16 each per lab. Each workstation has one set of the equipment listed above except for Lab 125 which only has power supplies and computers. Some fully-licensed and well-known software/tools are provided on the computers for students' use, such as Cadence, Orcad, PSpice, Matlab, and Codewarrier C Development. Students have an opportunity to gain the knowledge to utilize and manipulate the software in achieving the objectives for the certain courses.

The majority of the equipment was purchased for approximately $270,000 in 1998 when the program started. An estimated amount of annual costs of maintenance and upgrades is calculated to be in the range of $3-10k. Although no major upgrades had been done on the equipments, they still function well and have a projected lifetime of about 20 years.

Department of Mechanical Engineering Computing Resources

Major Mechanical Engineering computing resources are as follows:

- **Student Lab – Bourns Hall B207.** This is a general-purpose student lab containing about 35 PCs running Windows XP. A variety of software is available for word processing, spreadsheets, mathematics, computer aided drafting (CAD), engineering applications, and Internet access. Students can access the Unix servers to read e-mail and run large computing jobs. The lab also contains a laser printer and a color flatbed scanner. Access to the room is provided 24 hours a day, 7 days a week through card access.
- **Student Lab – Bourns Hall B238.** This is virtually identical to the Student Lab in Bourns Hall B207 described immediately above.
- **Student Lab - Bourns Hall B213AA.** This lab contains 10 PCs at lab benches all running Windows XP. The bench machines include a hardware data acquisition (daq) board. The daq board, along with LabView software, allows the machines to interface with data collection and control hardware for use in lab experiments. A laser printer is also provided.
- **Research.** Various PCs and Unix workstations are available for use by researchers and faculty, and are used for such computing tasks as model simulation.

Also, as noted above, the Department shares administrative and research server resources with Chemical and Environmental Engineering.

Research Centers

This section describes relevant computing resources of the College's interdisciplinary research centers. While the major purpose of these centers is in support of research, we encourage undergraduates to become involved in research as a way of encouraging retention of engineering students to the bachelor's degree and encouraging them to pursue higher degrees.

The Center for Research in Intelligent Systems (CRIS) promotes interdisciplinary research for developing computer systems that are flexible, adaptive and intelligent. The ultimate goal of the Center is the research and development of autonomous/semiautonomous systems with sensing capabilities that are able to communicate and interact with other intelligent (biological and artificial) systems. These intelligent systems will be able to perform tasks that require understanding of the environment through knowledge, learning, reasoning and planning. Advancements in each of the many enabling technologies required represents a major challenge and will have great impact in a wide range of applications, such as autonomous navigation, manufacturing, robotics, photo-interpretation, space exploration, document understanding, remote sensing, human-computer interaction, environmental monitoring, image communication, digital libraries, data mining, management, economics and health care.

CRIS involves seven laboratories and an interdisciplinary team of faculty members from seven departments (Electrical Engineering, Computer Science, Psychology, Economics, Statistics, Mathematics and Management). More recently, new collaborations have developed with UCR's Biology and Botany/Plant Sciences faculty. The collaborations encourage greater in-depth understanding and broader perspectives than is frequently possible within a single department. CRIS will advance education and research goals of the university through an interdisciplinary graduate program and collaborative research in the intelligent systems area.

The principal CRIS facility is the Visualization and Intelligent Systems Laboratory (VISLab). VISLab occupies approximately 3,000 square feet of modern laboratory facilities. The VISLab is involved in research in the key areas of artificial intelligence, learning and image understanding techniques with application to image exploitation, image data management and autonomous systems.

1. **General Purpose Equipment:** 12 SUN workstations (6 Ultra2s, 4 Ultra1s, 2 Sparc20s) with a total of 4 terabytes of disk space for image storage and processing, 2 SGI workstations (Octane, Indigo), 5 Macintosh computers and 10 Window/NT based computers and associated equipment.
2. **Special Hardware for Image Processing and Computer Vision:** VITec and ITI Image Processors, Media 100xs video production equipment; infrared, laser and video cameras. An outdoor Videoweb laboratory (NSF sponsored program, 2006) is under development that will have a wireless network of about 80 video cameras and other nonimaging sensors. This laboratory will also serve as resource for massive data collection.

3. **Database and GIS Related Software:** Informix Universal Server with text, image, video and geodetic datablades; VIRAGE content-based visual information retrieval package, ESRI Arc/Info Geographic Information System and related GIS Tools.
4. **Modeling, Image Processing, Image Understanding and Learning Related Software Packages:** XPATCH and XPATCH-ES SAR object and scene modelers; PRISM infrared signature modeler; BRL; Matlab Toolboxes for signal processing, image processing, neural networks and optimization. KHOROS image analysis and processing; RADIUS development environment; IUE image understanding environment; KBVision computer vision and image processing; AVS graphics/image processing/visualization; Obvius; Genesis and various UNIX/MAC/PC applications and programming support packages. The laboratory also has a large library of software developed during prior work on image segmentation, feature extraction, target and object recognition, learning and image databases.

The College of Engineering Center for Environmental Research and Technology (CE-CERT) specializes on research in air quality and energy efficiency, particularly as these issues pertain to transportation. CE-CERT is largely self-supported by external contracts and grants and by an endowment. CE-CERT is a recognized leader in the development of experimental capabilities in vehicle exhaust measurement and analysis and tropospheric chemistry. The major experimental labs (light-duty vehicle emissions, heavy-duty vehicle emissions, gas-phase atmospheric chemistry, aerosol-phase atmospheric chemistry, and renewable fuels development) all have integrated computerized data collection systems. Because CE-CERT's research in these areas has regulatory implications, laboratories and procedures have been designed to satisfy the U.S. Environmental Protection Agency's requirements for Quality Assurance and Control.

Two groups specialize in modeling and, therefore, rely heavily on computing resources. The Transportation Systems Research Group operates systems for second-by-second collection of data on a vehicle's operations, and a network of Sun workstations for modeling of vehicle emissions as a function of operating conditions and parameters (known as modal emissions modeling). The Environmental Modeling Group operates regional-scale models of atmospheric fate and transport, including CAMx, MM5, and CMAQ. A large computing cluster (30-50 nodes) and data storage system with a redundant array of independent disks (RAID) is on-site at CE-CERT to support the group's modeling and training activities, which include operation of the Western Regional Modeling Center under contract with the Western Governors' Association.

Computing Services Available to Assist the Students and the Faculty

The campus Computing and Communications unit, with its professional staff, maintains the UC Riverside campus network and its Internet connections. The Marlan and Rosemary Bourns College of Engineering, with its professional computing staff and student assistants, provides full time system support to the students, faculty, and staff in The College.

The College has orientation sessions in the Unix computing labs for incoming students at the beginning of each academic year. For Computer Science students and others taking beginning Computer Science classes, such orientations are built into the initial laboratory sessions.

Accessibility of Computer Facilities to Students and Faculty

All students, faculty, and staff of The College have individual account access to one or more of the College's computing systems, as do all students in service courses offered by the College. All College of Engineering majors are given accounts on the College NFS network when they enter as freshmen or transfers, and those accounts are permanent for the duration of the students' tenure. This gives them unlimited access to these facilities, depending upon their major. Accounts grant access to the appropriate servers and lab machines, as well as to the Internet. Account files are stored centrally, on the servers, and are available seamlessly from each lab machine. Generally, the compute servers are accessible from anywhere on or off campus, via a secure shell. Accounts for students in service courses do not permit general access to the other computing facilities of The College, and they expire when the course has been completed. College systems personnel manage the creation and deletion of quarterly class accounts. They also maintain and update the records for the "permanent" accounts.

The individual password-protected computer accounts are provided subject to rules of usage, privacy, and permission for system monitoring. These are posted in the computing facilities, appear on screens at login, and are acknowledged by user signature when each account is issued.

Computer usage is automatically monitored by the operating systems of the various networked machines.

Physical access to the Bourns Hall and Engineering II general computing facilities is available 24 hours a day, 7 days a week, through an electronic card-key entry system. Appropriate access permits are coded into each card, depending upon the owner's status, major and course registration. Alternately, 24 hour access to the networked facilities is available via a secure shell from other campus locations, and from off-campus locations via modems.

The PCs in the special purpose labs are available only during regular laboratory sessions or scheduled open lab periods.

Students majoring in or taking courses in the College of Engineering are not charged for access to the computing facilities of The College. For other students, the campus facilities operated by C&C are available free of charge.

The salaries of the professional systems administrators and their student assistants are funded from the annual permanent budget of The College.

Funds for the initial purchase of the computing equipment for The College came from the moveable equipment funds allocated for equipping the new Engineering building. Funds for maintenance and replacement, as well operating expenses, for these computing facilities are now included in the annual budget for The College.

6.B Library

Engineering collections are housed in the Science Library. The Science Library has a seating capacity of 1,500 including individual carrels, computer labs and group study rooms. The library

offers 60 computers for students to use in their research and another 32 computers used for information literacy instruction. The library also provides both wired and wireless access to the internet from students' laptop computers.

Current Library hours are:
Monday-Thursday 8:00am – Midnight
Friday 8:00am to 5:00pm
Saturday 10:00am to 5:00pm and Sunday 1:00pm to Midnight.

The Science Library has a professional staff of 7 librarians, all of whom provide reference assistance to engineering students, faculty and staff. Of these librarians, one has subject responsibility for engineering and can help students, faculty and staff with more in depth questions. The Engineering Librarian also conducts tutorials and classes on engineering information topics, and maintains Web pages and path-finders to assist engineering students, faculty and staff in finding the information they need.

The Science Library offers a full range of reference services, including walk-up, telephone, and electronic mail reference services as well as reference by appointment. The Science Library reference desk is staffed 60 hours per week when school is in session and 40 hours per week during inter-session periods. In addition to these standard services, engineering students can get additional reference help from the Engineering Librarian. The Engineering Librarian is available for extended consultation on Senior Design or other research projects. Phone and in-person services are available 9 a.m.-8 p.m. Monday-Thursday, 9 a.m.-5 p.m. on Friday and 1 p.m.-5 p.m. on Saturday and Sunday. A chat reference consortium with the other UC libraries, currently being piloted, has the potential to extend the reference hours to 9 p.m. nightly.

Incoming freshman typically get a library orientation session in their introductory classes. They might also have additional information literacy instruction in classes that require outside research, such as senior design classes. One-on-one or group tutorials are available for any research topic that might be desired and helpful.

Library Collections

Books and Journals
Engineering books are acquired as part of the Science Library's approval plan, ordered from catalogs or suggested by students, faculty and staff. Recently, the library has begun to purchase e-books for engineering and currently maintains a collection of more than 500 electronic books. The library currently subscribes to 121 engineering journals in print, and UCR students have access to more than 1,800 journals online. UCR has access, for example, to all of the journals and proceedings of both IEEE and ACM. Faculty, staff and students may suggest new monographs, journals or other media to be purchased by the library.

Journal Databases Available to Students
UC Riverside students have access to a number of journal databases to assist them in their research in engineering and in other areas of study. The California Digital Library has licensed, across all of the UC schools, INSPEC, Compendex and the Web of Science as well as SciFinder Scholar for chemistry and chemical engineering and Biosis or MEDLINE for biotechnological literature. UCR also licenses Water Resources Abstracts locally.

Other Collections
The Science Library maintains a collection of videotapes applicable engineering in the Media Library. The Media Library has viewing stations and viewing rooms and will check video materials out to instructors to use in their classes.

The following table provides statistical information about UCR's libraries.

	CURRENT COLLECTION RESOURCES	
	Books	Periodicals
Entire Institutional Library	(Volumes) 2,305,526	(Titles) 23,783
Engineering and Computer Science	63,669	121 (+1819 online)

LIBRARY EXPENDITURES*

	2003-2004	2004-2005	2005-2006
Expenditures for Engineering (Total)	$114,317	$126,736	$130,255
Books	$37,000	$48,000	$55,956
Periodicals	$75,517	$75,736	$72,091
E-Book Packages	$1,800	$3,000	$2,208

*All figures are approximate and do not include the large amount of electronic materials that we receive through consortial arrangements with other University of California Schools.

6.C Career Center

The main volume of the Self-Study describes the College's Professional Development Milestones program. This program is designed to work in conjunction with UCR's Career Center to help students prepare for jobs or higher academic pursuits after completion of the bachelor's degree. Services include resume writing workshops, mock interviews, job fairs, and meetings with representatives of individual companies throughout the year.

The College and the Career Center encourage undergraduates to have at least one internship during the summer or during the school year. Internships can be taken for pay and/or for course credit. The for-credit option designates the internship as Engineering 180. It requires a faculty member to sign off on the internship experience as relevant to the student's career development. The faculty member also assigns a parallel project to the student; ideally, this should be something based on the student's work during the internship, or requiring unique resources available at the internship site. The faculty member's grade of the student project serves as the grade for the Engineering 180 course. The employer has no involvement in grading the student.

For every internship, we request that both the student and the employer establish a Learning Agreement. This sets forth the objectives for the internship and asks both the student and the employer, separately, to review the outcomes of the internship at the end of the period. We also encourage the employer to have an end-of-internship meeting with the student to review strengths and weaknesses. The Learning Agreement and review forms are reproduced on the following pages.

The Career Center's mock interview service is conducted in conjunction with student professional societies, including the Society of Women Engineers and the IEEE. In 2005, companies that provided interviewers for this program were Fleetwood Enterprises, Kroger, and Raytheon. In 2006, participating companies were Ambryx Biotechnology, the City of Riverside, Fleetwood, Kroger, and Luminex.

Academic Internship Program Learning Agreement

For students who are **not seeking academic credit**

Complete and return to: Academic Internship Program, Veitch Student Center, NW Wing
Riverside, CA 92521-0211 (951) 827-3631 Fax (951) 827-2447
To Be Submitted Preferably Within 10 Days of Start Date

Please type or print with ink.

STUDENT INFO

Student's ID Number:		Major:	
Name:		Class Level:	
Address:			
City:		State:	Zip:
Local Phone: ( )	Permanent Phone: ( )	e-mail:	

EMPLOYER INFO

Agency Name:			
Address:			
City:		State:	Zip:
Name of Supervisor:		Phone: ( )	
Check one: ( ) Internship ( ) Co-op	Quarter: ( ) Fall ( ) Winter ( ) Spring ( ) Summer		
Duration of Agreement: From _____ To _____		Hours/Week:	Salary:

POSITION INFO

INTERNSHIP PROPOSAL: (Include learning objectives of the internship, duties, responsibilities, and nature of work to be performed)

REQUIRED SIGNATURES

Student Signature	Date	Site Supervisor Signature	Date	Internship Coordinator	Date

Evaluation of Student Intern

Student / Employer Information	
Student:	Student ID#:
Agency/Firm:	
Supervisor:	Title:
Internship Period: From _____ To _____	

Supervisor: Please complete the following evaluation of your intern/co-op student utilizing the rating scale indicated below. Note any qualifications under "comments" that may clarify or elaborate your ratings on particular indicators. Return evaluation to:

Career Center, AIP
Veitch Student Center, N.W. Wing, University of California
Riverside CA 92521-0211 • (951) 827-3631 • Fax (951) 827-2447

1-Superior • 2-More than Satisfactory • 3-Satisfactory • 4-Improvement Needed • 5-Unsatisfactory • N/A

Rating of Student's Performance	***Comments***
___ Accepts and follows directions	_____
___ Works as a team member	_____
___ Student is self-starting on work projects	_____
___ Organizes and completes projects on schedule	_____
___ Amount of work produced	_____
___ Demonstrates interest in career field	_____
___ Written communication	_____
___ Oral communication	_____
___ Analytical ability	_____
___ Research performance in relation to project subject matter	_____
___ Decision making and recommendation ability	_____
___ Overall evaluation of student's performance	_____

Additional Comments:

This report has been discussed with the student intern: _____Yes_____No
NOTE: University policy allows interns to review their internship evaluation.

Signature:_____ Date:_____

Student Evaluation of Internship Experience

Student / Employer Information

Student Name: _____ Student ID#:
Title of Position:
Agency/Firm:
Supervisor: Title:
Internship Period: From To

The objective of the Academic Internship Program (AIP) is to provide students with a meaningful learning experience through means of practical work experience relating to their academic studies or career interests. Please note your perceptions and reactions below. Please return evaluation, prior to end of work period, to:

Career Center, AIP
Veitch Student Center, NW Wing, University of California
Riverside CA 92521-0211 (951) 827-3631 • Fax (951) 827-2447

Evaluation

1-Excellent 2-Good 3-Average 4-Marginal 5-Unsatisfactory

	1	2	3	4	5
Orientation to the position	☐	☐	☐	☐	☐
Task and activities training	☐	☐	☐	☐	☐
Quality of tasks and activities	☐	☐	☐	☐	☐
Communication with supervisor	☐	☐	☐	☐	☐
Acceptance by co-workers	☐	☐	☐	☐	☐
Educational value	☐	☐	☐	☐	☐
Career exploration	☐	☐	☐	☐	☐
Physical environment of the internship	☐	☐	☐	☐	☐
Overall rating	☐	☐	☐	☐	☐

Please attach a brief written statement (one to two paragraphs) describing your internship experience in relation to your academic pursuits and career interests. Would you recommend this internship experience to other students?
If applicable, indicate any comments or suggestions you feel are important for program improvements. Could we use your name and/or excerpts from your evaluation to promote the internship program? Please circle YES or NO. Thank You.

Signature: _____ Date: _____

6.D Honors Program

The University Honors Program (UHP) was established in 1989. It is divided into two key components: the Lower Division Program and the Upper Division Program. Other very important aspects of the program are Personal Growth and Community Service.

Participation in the Lower Division Honors Program is by application. Admission requires that an incoming freshman have a minimum cumulative high school grade-point average of 3.5, SAT scores in the 90th percentile, and an excellent high school record of both scholarship and service. Students with SAT scores below 90th percentile can apply and their application will be considered by the UHP Committee. Students with GPAs below 3.5 will not be considered for the University Honors Program.

All Honors first-year students must complete the First Year Learning Contract each quarter. The contract requires students to meet with the Lower Division Coordinator and the Peer Mentor three times each during Fall quarter, as well as meet with their academic advisor. In addition, students must complete 10 hours of community service and personal growth, attend seminars, and attend a Career Services Orientation.

The Sophomore Applied Learning Component is an opportunity for excellent UCR freshmen to join the UHP at the end of their first year. Applications to the Sophomore Applied Learning Component are accepted only from current first-year freshmen and only during spring quarter. Qualified students will be invited to apply via their campus e-mail account. Applicants must have cumulative UCR GPAs of 3.5 or above. Students who complete all elements of the Applied Learning Component will receive a certificate and a letter from the Director of the University Honors Program, and will have this achievement noted on their official University transcript. Other benefits include recognition in the Commencement book as completing Sophomore Honors. Additional rewards include smaller interactive courses and Honors housing.

To complete the requirements for Lower Division University Honors, a student must take a minimum of four 4-unit Honors courses over two years in addition to the introductory ethics course in the Fall quarter of the first year and the HNPG 10A and 10B series in Winter and Spring quarters. Students must maintain a cumulative GPA of 3.2 or higher to remain in good standing in the Honors program, and must achieve a B or above in all Honors courses.

Students who have completed the Lower Division program may apply to the Upper Division Honors Program. Transfer students with excellent academic records after their first quarter here also may apply. Students who have not participated in Lower Division Honors may apply or be nominated by a faculty member for Upper Division. The distinction of Upper Division is awarded upon graduation to students who complete an approved thesis project and maintain an overall major GPA and cumulative GPA of 3.5 or higher. The thesis tests students' intellectual initiative and provides the opportunity to look ahead to the challenges of careers and graduate or professional school. The experience of working carefully and closely with faculty mentors on a significant project is profound and deeply rewarding. The honors designation appears on the official transcript.

Honors students by nature are high achievers academically. They are self-directed learners and exhibit a wide range of interests. They are traditionally active participants in all aspects of campus life. To assist Honors students in establishing personal direction and a well rounded personal array of experiences, all UHP students are asked to engage in activities leading toward personal growth. Honors students are also asked to become involved in and contributors to the campus or the community. For their Personal Growth experiences, many students choose to become members of student clubs and organizations, take music and art lessons, enroll in classes through the Recreation Center, or participate in study groups through the Learning Center.

The Community Service requirement can be fulfilled through organized charitable efforts conducted by UHP, Staff Assembly, or other organizations.

6.E Learning Center

The Learning Center is a team of educators, counselors, and advanced students who provide a variety of services to help students succeed in their college classes. The Learning Center is for all students who are not satisfied with their current grades and/or academic performance. The center regularly sees first-year students (freshman and transfer) and graduate students, students on academic probation and those on the Dean's List. Any student who wants help can get it, and almost all services are free.

Major services include tutoring, placement testing, and organization of study groups. Another service, GradTrack, is designed to encourage and assist UCR undergraduates who are thinking about going to graduate or professional schools. While services are available to all interested students, GradTrack's special mission is to help underrepresented minority students, low-income and first-generation college students, and other students who have not traditionally aspired to post-baccalaureate education. GradTrack services include faculty mentoring, workshops, individual counseling, and test preparations for CBEST, GMAT, GRE, LSAT, and MCAT.

The Learning Center also is a point of access for peer-to-peer and professional mentoring and counseling, financial aid assistance, and study skills development.

The Learning Center offers a Computer Lab with 29 terminals featuring Microsoft Office software and Internet accessibility. The Computer Lab is also equipped with two disabled-accessible computers, one capable of accessing Dragon Naturally Speaking, Jaws, and Zoom Text. Use of the lab is free, except for a small charge for printing documents.

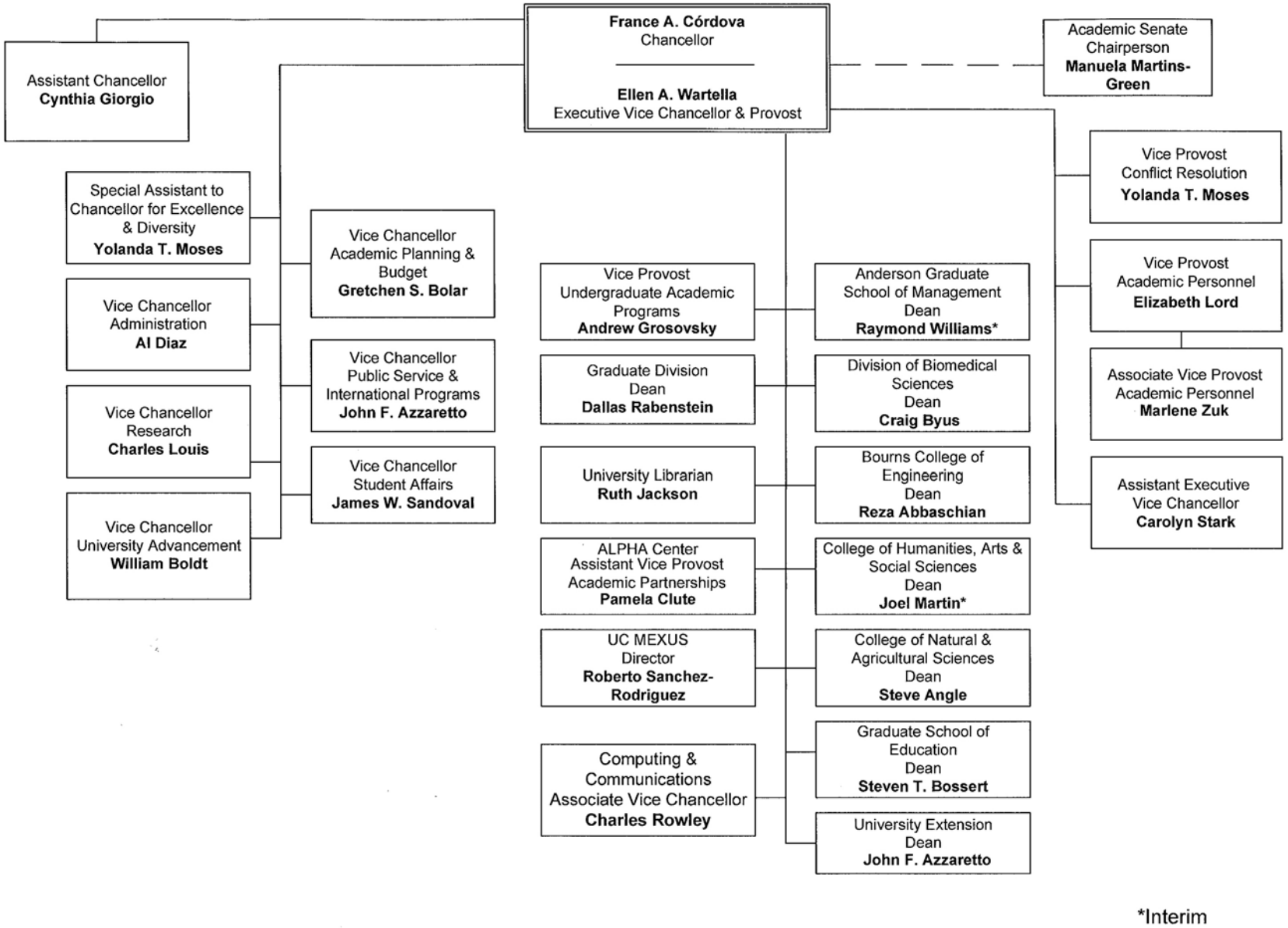
IIB. Background Information Relative to the Engineering Unit

1. Engineering Educational Unit

Provide an organizational chart showing the position of the engineering unit within the institution, listing each official by title, e.g., academic vice president, dean of college of engineering, etc., and label as Table II-2, *Organizational Chart.*

The organizational chart is provided on the following page.

Table II-2. Campus Organizational Chart.



Describe the engineering educational unit, listing those departments, divisions, programs, etc., which teach engineering subjects, conduct engineering research, or perform other engineering educational activities.

The Bourns College of Engineering consists of four departments (Chemical and Environmental Engineering, Computer Science and Engineering, Electrical Engineering, Mechanical Engineering) and four research centers, offering the following degrees. A fifth department, Bioengineering, will become independent of Chemical and Environmental Engineering in the fall of 2006.

Degree	Title	Established/Effective Dates
BS	Bioengineering	Fall 2005
BS	Chemical Engineering: Concentration in Biochemical Engineering	Established fall 1986, first freshmen admitted fall 1990; effective as of fall 2002
BS	Chemical Engineering: Concentration in Biochemistry	Established fall 1986, first freshmen admitted fall 1990; effective through 2001-02 academic year
BS	Chemical Engineering: Concentration in Bioengineering	Effective beginning fall 2003
BS	Chemical Engineering: Concentration in Chemical Engineering	Effective beginning fall 2002
BS	Chemical Engineering: Concentration in Chemistry	Established 1986; first freshmen admitted fall 1990; effective through the 2001-02 academic year
BS	Computer Engineering	Established fall 1999
BS	Computer Science	Established fall 1992
BS	Electrical Engineering	Established fall 1986; first freshmen admitted fall 1989
BS	Environmental Engineering: Concentration in Water Pollution Control	Established fall 1986; first freshmen admitted fall 1990
BS	Information Systems	Established fall 2001
BS	Mechanical Engineering	Established fall 1990; first freshmen admitted fall 1994
MS	Chemical & Environmental Engineering	Established fall 1998
MS	Computer Science	Established fall 1999
MS	Electrical Engineering	Established fall 1999
MS	Mechanical Engineering	Established fall 2001
Ph.D.	Chemical & Environmental Engineering	Established fall 2003
Ph.D.	Computer Science	Established fall 1991
Ph.D.	Electrical Engineering	Established fall 1999
Ph.D.	Mechanical Engineering	Established fall 2001

Give the name and title of the administrative head of the principal education unit and other administrative unit(s).

- Dean: Reza Abbaschian.
- Associate Dean, Graduate Affairs and Research: Mark R. Matsumoto.
- Associate Dean, Undergraduate Affairs: C.V. Ravishankar.
- Associate Dean, Finance and Administration: D. Patrick Hartney.
- Chair, Department of Chemical and Environmental Engineering: Marc Deshusses.
- Chair, Department of Computer Science and Engineering: Thomas H. Payne.
- Chair, Department of Electrical Engineering: Jie Chen. (As of July 1, 2006, Dr. Chen will be succeeded by Dr. Roger Lake.)
- Interim Chair, Department of Mechanical Engineering: Mark R. Matsumoto.
- Director, Center for Research in Intelligent Systems: Bir Bhanu.
- Director, Center for Nanoscale Science and Engineering: Robert C. Haddon.
- Interim Director, College of Engineering-Center for Environmental Research and Technology: Matthew J. Barth.
- Director, Center for Bioengineering: Jerome S. Schultz.

If all engineering programs do not come under a single administrative head, describe the other administrative unit(s) offering programs leading to a degree in engineering, and provide separate data where applicable. Include other units in Table II-2, Organizational Chart.

Not applicable.

Provide a copy of the engineering education unit mission statement.

Section IIA.5 presents the mission statement for the campus and for the Bourns College of Engineering. The Bourns College of Engineering mission statement is repeated here:

The vision and mission of the Bourns College of Engineering is to become a nationally recognized leader in engineering research and education. Our mission is to:

6. Produce engineers with the educational foundation and the adaptive skills to serve rapidly evolving technology industries.
7. Conduct nationally recognized engineering research focused at providing a technical edge for the U.S.
8. Contribute to knowledge in both fundamental and applied areas of engineering.
9. Provide diverse curricula that will instill our students with the imagination, talents, creativity and skills necessary for the varied and rapidly changing requirements of modern life and to enable them to serve in a wide variety of other fields that requires leadership, teamwork, decision making, and problem solving abilities.
10. Be a catalyst for industrial growth in the Inland Empire.

2. Programs Offered and Degrees Granted

List the full titles of all degrees in engineering--undergraduate, graduate, and professional--granted by the institution. If there are differences in the degrees awarded for completion of co-op programs, these should be clearly indicated. (see Table II-3 (Parts 1 and 2))

The undergraduate degree programs are listed below. For additional information, see Table II-3.

- BS, Bioengineering
- BS, Chemical Engineering, Conc. in Biochemical Engineering
- BS, Chemical Engineering, Conc. in Biochemistry
- BS, Chemical Engineering, Conc. in Bioengineering
- BS, Chemical Engineering, Conc. in Chemical Engineering
- BS, Chemical Engineering, Conc. in Chemistry
- BS, Computer Engineering
- BS, Computer Science
- BS, Electrical Engineering
- BS, Environmental Engineering, Conc. in Water Pollution Control
- BS, Environmental Engineering, Conc. in Air Pollution Control
- BS, Information Systems
- BS, Mechanical Engineering

Table II-3 appears on the following pages.

Table II-3 (Part 1). Engineering Programs Offered

Program Title (bachelor's degrees only)[1]	Modes Offered[2]				Nominal Years to Complete	Administrative Head	Administrative Unit or Units (e.g. Dept.) Exercising Budgetary Control	Submitted for Evaluation[3]		Offered, Not Submitted for Evaluation[4]	
	Day	Co-op	Off Campus	Alternative Mode				Now Accred.	Not Now Accred.	Now Accred.	Not Now Accred.
1.BS, Bioengineering	x				4	J.S. Schultz	Bioengineering **(a)**				x
2. BS, Chemical Engineering Conc. in Biochemical Engineering	x				4	M. Deshusses	Chem. & Env. Engr.	x			
3. BS, Chemical Engineering Conc. in Biochemistry	x				4	M. Deshusses	Chem. & Env. Engr.	x			
4. BS, Chemical Engineering Conc. in Bioengineering	x				4	M. Deshusses	Chem. & Env. Engr.	x			
5. BS, Chemical Engineering Conc. in Chemical Engineering	x				4	M. Deshusses	Chem. & Env. Engr.	x			
6. BS, Chemical Engineering Conc. in Chemistry	x				4	M. Deshusses	Chem. & Env. Engr.	x			
7. BS, Computer Engineering	x				4	J. Chen T. Payne	Electrical Engineering Comp. Sci & Engr.	x			
8. BS, Computer Science	x				4	T. Payne	Comp. Sci & Engr.		x		
9. BS, Electrical Engineering	x				4	J. Chen	Electrical Engineering	x			
10. BS, Environmental Engineering Conc. in Water Pollution Control	x				4	M. Deshusses	Chem. & Env. Engr.	x			

11. BS, Environmental Engineering Conc. in Air Pollution Control	x					M. Deshusses	Chem.& Env. Engr.	x			
12. BS, Information Systems	x				4	T. Payne	Comp. Sci & Engr.				x
13. BS, Mechanical Engineering	x				4	S. Mahalingam	Mechanical Engineering	x			

(a) New department as of 2006 as an offshoot of the Chemical & Environmental Engineering Department.

Table II-3 (Part 2). Degrees Awarded and Transcript Designations

Program Title[1]	Modes Offered[2]				Name of Degree Awarded[3]	Designation on Transcript[4]
	Day	Co-op	Off Campus	Alternative Mode		
Bioengineering	x				BS, Bioengineering	BS, Bioengineering
Chemical Engineering	x				BS, Chemical Engineering Conc. in Biochemical Engineering	BS, Chemical Engineering Conc. in Biochemical Engineering
Chemical Engineering	x				BS, Chemical Engineering Conc. in Biochemistry	BS, Chemical Engineering Conc. in Biochemistry
Chemical Engineering	x				BS, Chemical Engineering Conc. in Bioengineering	BS, Chemical Engineering Conc. in Bioengineering
Chemical Engineering	x				BS, Chemical Engineering Conc. in Chemical Engineering	BS, Chemical Engineering Conc. in Chemical Engineering
Chemical Engineering	x				BS, Chemical Engineering Conc. in Chemistry	BS, Chemical Engineering Conc. in Chemistry
Computer Engineering	x				BS, Computer Engineering	BS, Computer Engineering
Computer Science	x				BS, Computer Science	BS, Computer Science
Electrical Engineering	x				BS, Electrical Engineering	BS, Electrical Engineering
Environmental Engineering	x				BS, Environmental Engineering Conc. in Water Pollution Control	BS, Environmental Engineering Conc. in Water Pollution Control
Information Systems	x				BS, Information Systems	BS, Information Systems
Mechanical Engineering	x				BS, Mechanical Engineering	BS, Mechanical Engineering

3. Information Regarding Administrators

Furnish current summary *curriculum vitae* for the administrative head of the engineering educational unit(s) and any associates or assistants who have faculty status or are in responsible charge of a major service unit such as student counseling center, co-op coordination, etc. The summary *curriculum vitae* may be provided in any format but must be limited to one page.

One-page biographical sketches for administrators and department chairs are provided on the following pages.

Reza Abbaschian
Dean, Bourns College of Engineering
Professor of Mechanical Engineering
A342 Bourns Hall, University of California, Riverside, CA 92521 (951) 827-6374 rabba@engr.ucr.edu

Professional Preparation

University of Tehran, Iran	Mining Engineering	B.S., 1965
Michigan Technological University	Metallurgical Engineering	M.S., 1968
University of California, Berkeley	Materials Science and Engineering	Ph.D., 1971

Appointments

2005-present. University of California, Riverside. Dean of the Bourns College of Engineering and Professor of Mechanical Engineering.

1980-2005. University of Florida, Gainesville. Vladimir A. Grodsky Professor of Materials Science and Engineering (February 2000-September 2005). Chairman, Department of Materials Science and Engineering (1987-2002). Acting Chairman, Department of Materials Science and Engineering (1986-1987). Professor (1983-2005), Associate Professor (1980-1983). Provided leadership for the department to move up in ranking to top 10 in the nation according to *U.S. News & World Report*. Expanded the department by adding 16 faculty members, bringing the total to 32. Increased enrollment to 232 graduate students and 110 upper-division undergraduates, with 130 in the Ph.D. program (the largest MSE department in America). Actively promoted diversity: 40 women, 16 African-Americans, 14 Asian-Americans, and 5 Hispanics among the U.S. graduate students.

Summer 1981. NASA Space Processing Laboratory, Marshall Space Flight Center, Huntsville, AL. Visiting Scientist.

March-December 1980. Massachusetts Institute of Technology. Visiting Scientist.

1972-1980. School of Engineering (formerly Pahlavi University), Shiraz, Iran. Associate Professor (1974-1980), Assistant Professor (1972-1974). Chairman, Department of Materials Science and Engineering (1974-1976).

1978-1978. University of Illinois, Urbana. Visiting Associate Professor, Department of Metallurgy and Mining Engineering (sabbatical leave).

1968-1971. University of California, Berkeley. Research Assistant and Post-graduate Research Assistant, Department of Materials Science and Engineering.

Summer 1967. US Steel Corporation, Gary, IN. Research Analyst.

Selected Synergistic Activities

President of ASM International, the nation's largest materials association (installed September 26, 2005). Fellow of ASM since 1992.

2003 ASEE Donald E. Marlowe Award in recognition of "creative and distinguished administrative leadership in engineering and engineering technology education."

Fellow of The Minerals, Metals, & Materials Society, March 2000: the highest award bestowed by TMS to no more than 100 members. TMS Leadership Award for "outstanding leadership in the fields of metallurgy and materials," 1999. TMS Educator Award for "outstanding educator, leader, researcher and inventor who provides a modern standard for today's academician," 1998.

Council on Academic Freedom, Faculty Quality & Faculty Welfare, 2004-present.

Mark R. Matsumoto
Interim Dean, Bourns College of Engineering
A342 Bourns Hall, University of California, Riverside, CA 92521-0425 matsumot@engr.ucr.edu

Professional Preparation

University of California, Irvine	Civil Engineering	B.S., 1977
University of California, Davis	Environmental Engineering	M.S., 1980
University of California, Davis	Environmental Engineering	Ph.D., 1982

Appointments

1994-present. University of California, Riverside. Interim Dean (July 2004-Sept. 2005 and January-June 2002). Associate Dean, Research and Graduate Studies, Bourns College of Engineering, July 1999-present. Professor of Environmental Engineering, 1994-present. Chair, Department of Chemical and Environmental Engineering, 1994-2000.

1983-1994. State University of New York Buffalo, Department of Civil Engineering. Assistant Professor (1983-89), Associate Professor (1989-94).

1978-82. University of California, Davis, Department of Civil Engineering. Research Assistant (1978-79), Postgraduate Research Engineer (1979-81), Assoc. Development Engineer (1981-82).

Synergistic Activities

- Reviewer, *Journal of Environmental Engineering, Water Environment Research, Water Research, Journal of Soil and Sediment Contamination, Journal of Hazardous Materials, Journal of Environmental Quality*, U.S. EPA Small Business Innovative Research Program.
- Editorial Board, *Advances in Environmental Research*.
- Consultant: Orange County Sanitation District, Energy Resource Institute.
- Invited Workshop Contributor: 2002 International Containment Conference Workshop sponsored by U.S. EPA and DoE, and DuPont Corporation.

Chinya V. Ravishankar
Professor of Computer Science and Engineering
Associate Dean, Undergraduate Affairs
A342 Bourns Hall, University of California, Riverside, CA 92521 ravi@engr.ucr.edu (951) 827-5318

Professional Preparation

Indian Institute of Technology, Bombay	Chemical Engineering	B.Tech, 1975
University of Wisconsin-Madison	Computer Sciences	M.S., 1986
University of Wisconsin-Madison	Computer Sciences	Ph.D., 1987

Appointments

1999-present. University of California, Riverside. Professor, Department of Computer Science and Engineering. Associate Dean, Undergraduate Affairs, 2005-present.

1986-1999. University of Michigan, Ann Arbor. Research Scientist (1996-1999), EECS Department and the Information Technology Division. Associate Research Scientist (1991-1996), EECS Department and Information Technology Division. Assistant Professor (1986-1991), Electrical Engineering and Computer Sciences Department.

Synergistic Activities

• Associate Editor, IEEE Transactions on Knowledge and Data Engineering, IEEE Press.
• Program Committee, ACMSIGMOD'99, International Conference on Management of Data, Philadelphia,
PA, May 1999.
• Program Committee, ACM First International Conference on Data Warehousing and On-Line Analytical Processing, Washington D.C., November 7, 1998.
• Program Committee, Ninth International Conference on Scientific and Statistical Databases, 1997.
• Program Committee, Fifth International Symposium on Large Spatial Databases, 1997.
• Program Committee, Tenth International Conference on Distributed Computing Systems, 1990.
• Reviewer for IEEE Transactions on Software Engineering, IEEE Transactions on Parallel & Distributed Systems, IEEE Transactions on Computers, IEEE Transactions on Knowledge & Data Engineering,
and numerous other journals and conferences. Also, reviewer for National Science Foundation, and the National Sciences and Engineering Research Council of Canada.

Marc A. Deshusses
Professor and Chairman, Department of Chemical and Environmental Engineering
A242 Bourns Hall, University of California, Riverside, CA 92521 (951) 827-2477 mdeshuss@engr.ucr.edu

Professional Preparation

Swiss Federal Inst. of Technology, Lausanne	Chemical Engineering	1990
Swiss Federal Inst. of Technology, Zurich	Technical Sciences	Ph.D., 1994
Swiss Federal Inst. of Technology, Zurich	Biochemistry	Postdoctoral, May-July 1994

Appointments

1994-present. University of California, Riverside. Professor and Chair, Department of Chemical and Environmental Engineering (July 2004-present). Associate Professor (2001-2004). Assistant Professor (1994-2001). Faculty member, Environmental Toxicology Graduate Program (1996-present). Faculty member, Microbiology Graduate Program (1997-present).

Synergistic Activities

Memberships: American Chemical Society, American Institute of Chemical Engineers, Air and Waste Management Association, Water Environment Federation, External Advisory Committee, NASA Purdue Advanced Life Support Center (by invitation).

Editorial/Professional: Editorial Board, *Journal of Industrial Microbiology & Biotechnology* [99-02; 03-present]; Editorial Board, *Applied Biochemistry and Biotechnology* [03-present]. Reviewer, *Environmental Science and Technology, Biotechnology and Bioengineering, Chemical Engineering Science, Journal of Environmental Engineering, Environmental Catalysis, Journal of the Air & Waste Management Association.*

Leader for ABET accreditation efforts for both Chemical Engineering and Environmental Engineering Programs [00 - 02] (resulted in 6 years accreditation for both programs).

1997/98 Bourns College of Engineering Outstanding Teaching Award.

Thomas H. Payne
Associate Professor and Chair, Computer Science and Engineering
351 Engineering Building II, Riverside, CA 92521 (951) 827-2244 thp@cs.ucr.edu

Professional Preparation

Marquette University	Mathematics	B.S., 1964
University of Notre Dame	Mathematics	M.S., Ph.D., 1967

Appointments

1967-present. University of California, Riverside. Department of Computer Science and Engineering. Assistant Professor (1967-73). Associate Professor (1973-present). Research area: Efficient implementation of programming language features related to operating systems, such as concurrency, protection, dynamic binding.

Synergistic Activities

Awards and Honors:
- T.J. Watson Memorial Scholarship
- NASA Traineeship

Memberships:
- Sigma Xi
- Association for Symbolic Logic
- Association for Computing Machinery (ACM)
- Mathematics Association of America
- American Mathematical Society

Consulting:
- Consultant for a number of R&D companies in California

Jie Chen
Professor and Chair, Department of Electrical Engineering
343 Engineering Building II, Riverside, CA 92521 (951) 827-3688 jchen@ee.ucr.edu

Professional Preparation

Northwestern Polytechnic Univ., China	Aerospace Engineering	B.S., 1982
University of Michigan	Electrical Engineering	M.S.E., 1987
University of Michigan	Mathematics	M.A., 1987
University of Michigan	Electrical Engineering	Ph.D., 1990

Appointments

1991-1993. Georgia Institute of Technology, Atlanta. Research Fellow.

1994-present. University of California, Riverside. Assistant Professor (1994-1997). Associate Professor 1997-1999). Professor (1999-present).

Synergistic Activities

Professional Societies
- IEEE
- IEEE Control Systems Society

Honors and Awards
- Best Paper Presentation Award, 1993 American Control Conference, San Francisco, CA, June 1993
- Adjunct Professor, by invitation, Northwestern Polytechnic University, China, 1994 – Present
- UCR Regents Fellowship Award, UCR, 1995
- National Science Foundation Career Award, 1996
- SICE International Award, 2004
- Guest Professor, Zhejiang University, China, 1997 – present
- Visiting Fellow, Tokyo Institute of Technology, Tokyo, Japan, July 2000
- Visiting Associate Professor, Hong Kong University of Science and Technology, Hong Kong, P.R. China, January - June 2000
- Guest Professor, Dalian Institute of Technology, Dalian, P.R. China, 8/2001 – present
- Visiting Fellow, School of Quantitative Methods and Mathematical Sciences, University of Western Sydney, Penrith, Australia, May-June, 2004.
- Adjunct Professor, Harbin Institute of Technology-Shenzhen Graduate School, Shenzhen, P.R. China, since April 2004.

Publishing
- Founding Editor-in-Chief, *Journal of Control Science and Engineering*, since April 2006.
- Guest Editor, *IEEE Control Systems Magazine*, since August 2005.
- Associate Editor, *Automatica*, since March 2004.
- Associate Editor, *Journal of Control Theory and Applications*, since March 2004.
- Guest Editor, *IEEE Transactions on Automatic Control*, August 2001--August 2003.
- Associate Editor, *IEEE Transactions on Automatic Control*, January 1997--December 2000.

Bir Bhanu
Professor of Electrical Engineering and Director, Center for Research in Intelligent Systems
219 Engineering Bldg. II, University of California, Riverside, CA 92521 (951) 827-2425 bhanu@cris.ucr.edu

Professional Preparation

Massachusetts Inst. of Technology, RLE	Electrical Engr./Computer Sci.	S.M., 1977
Massachusetts Inst. of Technology, RLE	Electrical Engr./Computer Sci	E.E., 1977
University of Southern California	Electrical Engineering	Ph.D., 1981
University of California, Irvine	Business	MBA, 1984

Appointments

1991-present. University of California, Riverside. Professor of Electrical Engineering and Computer Science and Engineering. Director, Center for Research in Intelligent Systems (1998-present). Director, Visualization Laboratory (1991-present). Founded Electrical Engineering Department at UCR and served as its first Chair (1991-1994).

1986-1991. Honeywell Inc. Senior Honeywell Fellow.

1981-1991. University of Utah. Associate Professor of Computer Science. Leave of absence for the academic year 1986-1987.

1981-1984. Ford Aerospace & Communications Corp. Engineering Specialist.

1980-1981. INRIA, Rocquencourt, France. Research Fellow.

1978. IBM Research Laboratory, San Jose, CA. Academic Associate, Computer Science Department.

Synergistic Activities

1. Eleven U.S. and International Patents (plus four in process) and over 250 reviewed publications, including over 90 Journal Papers, in Computer Vision, Pattern Recognition and Learning. Co-author of books on Computational Learning for Adaptive Computer Vision (Springer 2005), Dynamic Sensor Fusion (SPIE 2005), Computational Algorithms for Fingerprint Recognition (Kluwer 2003), and Co-Editor of book on Computer Vision Beyond The Visible Spectrum, (Springer 2004).
2. Fellow – IEEE, AAAS, IAPR and SPIE for contributions in computer vision, pattern recognition, learning, and education. Senior Honeywell Fellow – Honeywell Inc. Worked on biological imaging at USC Medical School, USC Cancer Research Center (Dr. Marsh and Dr. Tokes) and USC Image Processing Institute. Published papers on biological image segmentation, motion understanding (including a book) and 2D/3D object recognition.
3. Won two outstanding paper awards from Pattern Recognition Society 1989, 1998. Won various awards for research/technical excellence and team efforts from College of Engineering -UCR, Honeywell and IBM. Served as associate editor/guest editor of various IEEE Transactions (Pattern Analysis and Machine Intelligence; Image Processing; Systems, Man and Cybernetics; Robotics and Automation) and several other journals in Computer Vision, Pattern Recognition and Robotics.
4. Chair, IEEE Conference on Computer Vision and Pattern Recognition 1996, DARPA Image Understanding Workshop 1994, IEEE Workshop on Applications of Computer Vision 1992, 2000, Program Chair, IEEE Workshop on Computer Vision Beyond The Visible Spectrum, 1999-2001, Chair, IEEE Workshop on Learning in Computer Vision and Pattern Recognition, 2003-04, Program Committee member of many conferences in Computer Vision and Pattern Recognition, Human Motion and Video Computing.

Robert C. Haddon
Distinguished Professor and Director, Center for Nanoscale Science and Engineering
University of California, Riverside, CA 92521-0425 haddon@ucr.edu

Professional Preparation

Melbourne University, Australia	Chemistry	B. Sc. (Hon), 1966
Pennsylvania State University	Organic Chemistry	Ph. D., 1971
University of Texas at Austin	Organic Chemistry	1972-1973

Appointments

2000-present. University of California, Riverside. Distinguished Professor of Chemistry and Chemical and Environmental Engineering. Director of the Center for Nanoscale Science and Engineering.

1999-present. Carbon Solutions, Inc. Founder and President.

1998-2000. Director, NSF MRSEC Advanced Carbon Materials Center.

1998. CarboLex, Inc. Co-founder and Vice President.

1997-2000. University of Kentucky, Professor of Chemistry and Physics.

1976-97. Bell Telephone Laboratories (AT&T, Lucent Technologies).

1973-76. Australian National University, Queen Elizabeth II Fellow.

Synergistic Activities

Service on the Editorial Advisory Boards of Advanced Materials, J. Amer. Chem. Soc., Chemical Physics Letters, Molecular Crystals and Liquid Crystals and Organizer of the Advanced Materials and Nanotechnology Subdivision of I&EC.

Founder and Chair of the Advanced Materials and Nanotechnology Subdivision of I&EC.

Matthew J. Barth
Associate Professor of Electrical Engineering
Associate Director, Center for Environmental Research and Technology
CE-CERT 022, University of California, Riverside, CA 92521-0434 barth@ee.ucr.edu

Professional Preparation

University of Colorado, Boulder	Electrical Engineering	B.S., 1984
University of California, Santa Barbara	Electrical Engineering	M.S., 1986
University of Tokyo, Japan	Research Student, Sys Engr.	1986-87
University of California, Santa Barbara	Electrical Engineering	Ph.D., 1990

Appointments

1991-present. Assistant then Associate Professor of Electrical Engineering; also Director of Transportation Systems and Vehicle Technology Research, University of California, Riverside, Bourns College of Engineering-Center for Environmental Research and Technology.

1989-91. Visiting Researcher, Department of Systems Engineering, Faculty of Engineering Science, Osaka University, Japan.

1985-89. Graduate Research Assistant, Electrical Engineering and Center for Robotic Systems in Microelectronics, University of California, Santa Barbara.

1985-86. Member of the Technical Staff, Advanced Technology Division, General Research Corporation, Santa Barbara, CA.

1979-84. Undergraduate Research Assistant, Laboratory for Atmospheric and Space Physics, University of Colorado, Boulder.

Research Areas of Interest

Intelligent Transportation Systems, Transportation/Emissions Simulation and Modeling, Vehicle Activity Analysis, Electric Vehicle Technology, Robotics, Computer Vision, and Advanced Sensing and Control.

Jerome S. Schultz
Distinguished Professor of Bioengineering
A242 Bourns Hall, University of California, Riverside, CA 92521 (909) 787-2859 jerome.schultz@ucr.edu

Professional Preparation

Columbia University, NY	Chemical Engineering	B.S., 1954
Columbia University, NY	Chemical Engineering	M.S., 1956
University of Wisconsin	Biochemistry and Chemical Engineering	Ph.D., 1958

Appointments

January 2004. University of California, Riverside. Distinguished Professor of Bioengineering, Department of Chemical and Environmental Engineering.

2001-2002. NASA-Ames Research Center, Division of Fundamental Biology. On leave from University of Pittsburgh, assisted in the development of a strategic plan to integrate biotechnology, nanotechnology, and information technology.

1987-2003. University of Pittsburgh. Chairman, Department of Bioengineering (1998-2002). Distinguished Service Professor of Engineering. Professor of Bioengineering. Professor of Chemical Engineering. Professor of Medicine.

1985-87. National Science Foundation. Deputy Director, Division of Cross-Disciplinary Research. Section Head, Emerging Engineering Systems.

1984. University of Maryland and National Institute for Standards and Technology (NIST). Director of Development, Center for Advanced Research in Biotechnology.

1964-87. University of Michigan. Chairman, Department of Chemical Engineering. Professor of Chemical Engineering.

1983. University of North Carolina, Chapel Hill. Visiting professor on sabbatical from Michigan.

1971-72. University of Nijimegen, Holland. Guest Professor of Physiology.

1958-64. Lederle Laboratories. Group Leader, Biochemical Research. Research and Development Engineer.

Synergistic Activities

- Chairman, Panel to Review International Biosensing Research Trends; Sponsors: NIH, NSF, 2002- .
- Editor in Chief, Biotechnology Progress – 1991-Present.
- NIH Study Sections, 1984-1988, 2004.
- President, American Institute for Medical and Biological Engineering – 1995.
- Member National Academy of Engineering – 1994.

4. Supporting Academic Departments

Table II-4 provides information about supporting academic departments for all academic-supporting units that provide any required portion of the instruction for engineering students in the programs being evaluated.

Table II-4. Supporting Academic Departments
For Academic Year: 2005-06 (October 2005)

Department or Unit	Full-time Faculty Head Count[1]	Part-time Faculty Head Count[2]	FTE Faculty[3]	Teaching Assistants	
				Head Count	FTE
Biochemistry	14	1	14.46	7	3.50
Biology	19	0	19.00	29	13.75
Chemistry	24	1	24.58	71	33.75
English	72	5	74.33	57	28.50
Environmental Sciences	23	0	23.00	5	2.50
Mathematics	36	9	40.13	56	23.62
Physics	30	2	30.90	40	18.00
Statistics	10	0	10.00	19	7.50

Provide data for all academic supporting units, e.g., Mathematics, Physics, Chemistry, English, Computer Science, etc., that provide any portion of the instruction required by the institution for engineering students.

1. the number of full-time faculty members (tenure track plus other teaching faculty, as classified in Table I) exclusive of teaching assistants.
2. the number of part-time, adjunct, or visiting teaching faculty members, exclusive of teaching assistants.
3. the sum of column 1 plus FTE** of column 2.

** For student teaching assistants, 1 FTE equals 20 hours per week of work (or service). For faculty members, 1 FTE equals what your institution defines as a full-time load.

5. Engineering Finances

Provide information about the support expenditures of the engineering unit, report the expenditures for support functions of the engineering educational unit(s) as a whole. The information is to be supplied for each of the three most current fiscal years. For the fiscal year of the visit, provide the budgeted amounts. If it is not possible to provide final budget figures in the report, they should be provided before or at the time of the visit. (see Table II-5)

Table II-5. Support Expenditures
Bourns College of Engineering including Centers and Programs

	1	2	3	4
	2004	2005	2006	2007
Fiscal Year	(prior to previous year)	(previous year)	(current year)	(year of visit)
Operations[1] (not including staff)	1,068,902.67	2,351,722.98	1,911,896.81	
Travel[2]	216,908.39	333,904.33	337,479.84	
* Equipment[3]				
Institutional Funds	1,206,725.57	739,788.62	780,736.96	
Grants and Gifts[4]	1,631,077.95	5,222,613.10	1,866,320.00	
Graduate Teaching Assistants	1,292,254.68	1,358,217.51	1,625,272.82	
Part-time Assistance[5] (other than teaching)	230,240.04	294,862.30	315,086.23	

* Based on University Policy, Equipment purchases of less than $5,000 (per item), not charged to the Equipment Budget Category-BC60

Notes
1. General operating expenses to be included here.
2. Institutionally sponsored, excluding special program grants.
3. Major equipment, excluding equipment primarily used for research. Note that the expenditures under "Equipment" should total the expenditures for Equipment. If they don't, please explain.
4. Including special (not part of institution's annual appropriation) non-recurring equipment purchase programs.
5. Do not include graduate teaching and research assistant or permanent part-time personnel.

6. Engineering Personnel and Policies

a. Personnel

Provide the number of personnel, both full-time and part-time, for the entire engineering unit and for each program being evaluated. (see Table II-6)

Table II-6 is presented below and is based on the following inputs and definitions:

Departments and groups covered:

- Chemical and Environmental Engineering Department
- Computer Sciences & Engineering Department
- Computer Engineering Program
- Electrical Engineering Department
- Mechanical Engineering Department
- Dean's Office (including Development Office, Student Affairs, & MESA)
- Center for Environmental Research and Technology (CE-CERT)
- Center for Nanoscience & Engineering (CNSE)
- Center for Research in Intelligent Systems (CRIS)

Administrative personnel:

- Dean and Associate Deans (Mark Matsumoto and Chinya Ravishankar counted as .50 FTE each)

Faculty:

- All faculty (excludes the Dean and Associate Deans' 50% appointments)

Other faculty excluding student assistants:

- Lecturers
- Adjunct Professors
- Professional Research Series (visiting and non-visiting titles)
- Postgraduates/Visiting Postdoctoral Researchers
- Junior Specialists
- Readers

Student teaching assistants:

- All graduate teaching assistants.

Student research assistants:

- All graduate research assistants.

Technicians/specialists:

- Development Engineers
- Programmer Analysts
- Staff Research Associates

- Laboratory Helpers and Assistants
- Physical Plant Superintendents

Office/clerical employees:

- Senior Analyst (Dean's Executive Assistant-E. Montoya)
- Assistant Analysts and Analysts
- Student Affairs Officers III (L. O'Neill) & Student Affairs Officers I & II
- Computer Resource Spec. II
- Student Assistants I & II

Other:

- Assistant Deans
- Directors & Managers (Functional Area)
- Admin/Coord/Officer (Functional Area)
- Specialist (Functional Area)
- Deputy Director (CE-CERT)
- Management Service Officers (MSOs)
- Administrative Specialist (N. Jahr)
- Prin. & Senior Administrative Analysts
- Student Affairs Officers III & IV (Asst. Director & Director of MESA)
- Senior Writer

Table II-6. Personnel and Students
Bourns College of Engineering

	HEAD COUNT		FTE	RATIO TO FACULTY
	FT	PT		
Administrative	1	2	2.00	
Faculty (tenure-track)	65	4	66.60	
Other Faculty (excluding student Assistants)	29	30	40.98	
Student Teaching Assistants (Grad Only)	17	88	61.00	0.9159
Student Research Assistants (Grad Only)	9	141	79.50	1.1937
Technicians/Specialists	35	8	38.50	0.5781
Office/Clerical Employees	29	105	52.57	0.7893
Others	20	5	22.46	0.3372

Undergraduate Student Enrollment	1251	23	1,262.50	18.9565
Graduate Student Enrollment	300	23	311.50	4.6772

Table II-6. Personnel and Students
Chemical and Environmental Engineering

NOTE: The Department of Chemical and Environmental Engineering supports two degree programs: Chemical Engineering and Environmental Engineering. (The department also has served as an administrative structure for a new Bioengineering Department, which is being established as of Fall 2006.) Faculty and staff are assigned to the department, not to the degree program.

	HEAD COUNT		FTE`	RATIO TO FACULTY
	FT	PT		
Administrative				
Faculty (tenure-track)	12	2	13.00	
Other Faculty (excluding student Assistants)	7	3	9.45	
Student Teaching Assistants	0	11	5.50	0.42
Student Research Assistants		19	9.50	0.73
Technicians/Specialists	3	2	4.62	0.36
Office/Clerical Employees	5	13	6.92	0.53
Others	1		1.00	0.08
Undergraduate Student Enrollment	162	1	162.50	12.50
Graduate Student Enrollment	57	5	59.50	4.58

Table II-6. Personnel and Students
Computer Science and Engineering

	HEAD COUNT		FTE	RATIO TO FACULTY
	FT	PT		
Administrative				
Faculty (tenure-track)	23	1	23.50	
Other Faculty (excluding student Assistants)	3	5	4.16	
Student Teaching Assistants	12	45	34.50	1.47
Student Research Assistants	3	44	25.00	1.06
Technicians/Specialists	2		2.00	0.09
Office/Clerical Employees	3	13	6.81	0.20
Others	1		1.00	0.04
Undergraduate Student Enrollment	316	14	323.00	13.74
Graduate Student Enrollment	133	6	136.00	5.79

Table II-6. Personnel and Students
Computer Engineering

NOTE: Computer Engineering is a degree program, not a department. It is supported jointly by the Department of Computer Science and Engineering and the Department of Electrical Engineering. It has no dedicated faculty or staff.

	HEAD COUNT		FTE`	RATIO TO FACULTY
	FT	PT		
Administrative				
Faculty (tenure-track)				
Other Faculty (excluding student Assistants)				
Student Teaching Assistants				
Student Research Assistants				
Technicians/Specialists				
Office/Clerical Employees				
Others				

Undergraduate Student Enrollment	160	1	160.50	
Graduate Student Enrollment				

Table II-6. Personnel and Students
Electrical Engineering

	HEAD COUNT		FTE	RATIO TO FACULTY
	FT	PT		
Administrative				
Faculty (tenure-track)	18	1	18.10	
Other Faculty (excluding student Assistants)	5	5	7.01	
Student Teaching Assistants	5	12	11.00	0.61
Student Research Assistants		25	12.50	0.69
Technicians/Specialists	2	1	2.50	0.14
Office/Clerical Employees	3	4	4.03	0.22
Others	1		1.00	0.06

Undergraduate Student Enrollment	190	3	191.50	10.58
Graduate Student Enrollment	76	8	80.00	4.42

Table II-6. Personnel and Students
Mechanical Engineering

	HEAD COUNT		FTE	RATIO TO FACULTY
	FT	PT		
Administrative				
Faculty (tenure-track)	12		12.00	
Other Faculty (excluding student Assistants)	2	8	4.05	
Student Teaching Assistants		20	10.00	0.83
Student Research Assistants		20	10.00	0.83
Technicians/Specialists	2	1	2.17	0.18
Office/Clerical Employees	2	9	4.08	0.34
Others	1		1.00	0.08

Undergraduate Student Enrollment	285	4	287.00	23.92
Graduate Student Enrollment	34	4	36.00	3.00

Table II-6. Personnel and Students
Undeclared Engineering Majors

NOTE: There is no "undeclared" department or degree in engineering. Data here are presented for the sake of completeness in the calculations of ratios per student enrolled.

	HEAD COUNT		FTE	RATIO TO FACULTY
	FT	PT		
Administrative				
Faculty (tenure-track)				
Other Faculty (excluding student Assistants)				
Student Teaching Assistants				
Student Research Assistants				
Technicians/Specialists				
Office/Clerical Employees				
Others[5]				

Undergraduate Student Enrollment	138	0	138.00	
Graduate Student Enrollment				

b. Faculty Salaries, Benefits, and Other Policies

Briefly summarize the promotion and tenure system and the processes used to determine faculty salaries. Faculty salary data may be provided at the option of the institution. (see Table II-7)

Merit, Promotion, and Tenure Process

The University of California utilizes a rank and step system as a basis for its merit, promotion, and tenure process for its Professorial series (see the UC *Academic Personnel Manual*, http://www.ucop.edu/acadadv/acadpers/apm/). At each consideration for a merit increase, promotion, and tenure a faculty evaluation file is prepared and reviewed at multiple administrative levels – department faculty, department chair, dean, campus Academic Senate, and Provost and Chancellor. Each reviewing body makes a recommendation for merit increase, promotion, or tenure, to the Provost and Chancellor for their final decisions.

Reviewing bodies which advise on actions concerning appointees in the Professor and corresponding series, are instructed to use the following criteria for appointment, promotion and appraisal.

The review committee is to judge the candidate with respect to the proposed rank and duties, considering the record of the candidate's performance in (1) teaching, (2) research and other creative work, (3) professional activity, and (4) University and public service. Mentoring and advising of students or new faculty members is encouraged and given recognition in the teaching or service categories of academic personnel actions. In evaluating the candidate's qualifications within these areas, the review committee exercises reasonable flexibility, balancing, when the case requires, heavier commitments and responsibilities in another. The review committee must judge whether the candidate is engaging in a program of work that is both sound and productive.

As the University enters new fields of endeavor and refocuses its ongoing activities, cases will arise in which the proper work of faculty members departs markedly from established academic patterns. In such cases, the review committees must take exceptional care to apply the criteria with sufficient flexibility. However, flexibility does not entail a relaxation of high standards. **Superior intellectual attainment, as evidenced both in teaching and in research or other creative achievement, is an indispensable qualification for appointment or promotion to tenure positions.** Insistence upon this standard for holders of the professorship is necessary for maintenance of the quality of the University as an institution dedicated to the discovery and transmission of knowledge. Consideration should be given to changes in emphasis and interest that may occur in an academic career.

In teaching, clearly demonstrated evidence of high quality in teaching is an essential criterion for appointment, advancement, or promotion. It is the responsibility of the department chair to submit meaningful statements, accompanied by evidence, of the candidate's teaching effectiveness at lower-division, upper-division, and graduate levels of instruction. More than one kind of evidence should accompany each file.

In the area of research there should be evidence that the candidate is continuously and effectively engaged in creative activity of high quality and significance. Publications in research and other creative accomplishment should be evaluated, not merely enumerated. The quality of publication outlets and impact of the research in the field are important factors.

System of Rank and Step

A. The "step" of an appointee is indicated by a Roman numeral after the rank, e.g., Assistant professor, Step II; Associate Professor, Step II; Professor, Step II. The step is *not* part of the title or the rank. It is an indicator of the stage of merit advancement of and individual within a rank. Salary guidelines are associated with specific ranks and steps.

B. Years at rank and step for appointees are recorded in their individual salary history records as follows:

    1. An academic-year (9-month) appointee who has served at least two full quarters or one full semester in any fiscal year (July 1 through June 30) receives one year of credit at rank and step.

    2. An academic-year (9-month) appointee who has served just one quarter in any fiscal year (July 1 through June 30) does not receive credit for that year at rank and step.

    3. A fiscal-year (11-month) appointee who is appointed during the period July 1 through January 1 receives one year's credit at rank and step.

    4. A fiscal-year (11-month) appointee who is appointed during the period January 2 through June 30 does not receive credit for that year at rank and step.

Normal Periods of Service

A. *Instructor*: Service in the rank of Instructor is limited to two years.

B. *Assistant Professor*: The total period of University service with the title Assistant Professor, or with this and certain other titles, shall not exceed eight years. There are six possible steps with the Assistant Professor rank. The normal period of service at a given step in this rank is two years. Only Assistant Professor, Steps II through IV are normally used. A faculty member must be at Assistant Professor Step IV or higher to be considered for tenure. Steps V and VI are used in exceptional situations and with proper justification (e.g. faculty members initial appointment is at Step III, has progressed steadily and has a few years remaining at rank before mandatory tenure review in the seventh year at rank).

C. *Associate Professor:* Faculty members with tenure must be appointed at the rank of Associate Professor or Professor. There are five possible steps with the Associate Professor rank. The normal total period of service in the rank of Associate Professor is six years. The normal period of service for Associate Professor, Steps I through III is two years. Steps IV and V may be used in exceptional situations and with proper justification. Service at Associate Professor, Step IV, will normally be partly or entirely in lieu of service at

Professor, Step I, for which the normal period of service is three years if such service. The situation for Associate Professor, Step V, and Professor, Step II, is exactly analogous to that for Associate Professor, Step IV and Professor, Step I.

D. *Professor*: There are nine possible steps with the Professor rank. The normal period of service is three years for Professor, Steps I through IV. Service at Step V may be of indefinite duration. Advancement to Professor, Step VI usually does not occur after less than three years of service at Step V and is granted on evidence of great scholarly distinction and national or international recognition, highly meritorious service, and evidence of excellent University teaching. Service at Professor, Step VI and higher, may be of indefinite duration. Advancement from Professor, Step VI to the next step usually does not occur after less than three years of service and is only granted on evidence of continuing great distinction, national or international recognition, highly meritorious service and excellent teaching performance.

   Advancement to an above-scale salary is reserved for scholars and teachers of the highest distinction whose work has been internationally recognized and acclaimed and whose teaching performance is excellent. Except in rare and compelling cases, advancement will not occur after less than four years at Step IX. Moreover, mere length of service and continued good performance at Step IX is not a justification for further salary advancement.

   There must be a demonstration of additional merit and distinction beyond the performance on which advancement to Step IX was based. A further merit increase in salary for a person already serving at an above-scale salary level must be justified by new evidence of merit and distinction. Continued good service is not an adequate justification. Intervals between such salary increases may be indefinite, and only in the most superior cases where there is strong and compelling evidence will increase at intervals shorter than four years be approved.

Off-Scale Salaries

When properly justified, appointment or advancement to a position with an off-scale salary may be approved in exceptional situations, for example, when necessary to meet competitive conditions. A salary for an appointee at a certain rank and step is designated as off-scale if the salary is not that associated with the given rank and step in the published salary scale for the relevant title series.

The Chancellor in consultation with the appropriate committee(s) of the Division of the Academic Senate, and the appropriate Vice President develops local procedures for the implementation of the off-scale policy. Such procedures shall include the criteria for appointment or advancement to a position with an off-scale salary, as well as for an appointee's continuation with an off-scale salary or return to an on-scale salary. When an individual is placed on an off-scale salary, the appointee must be notified of this action and the authorization plus any limitation shall be noted on the appropriate campus approval document.

Table II-7. University of California Systemwide Faculty Salary Scales for Business, Management, and Engineering (not including off-scale amounts)

Rank	Step	Years at Step	Annual	Monthly
Assistant Professor	I	2	$61,600	$5,133.33
	II	2	64,700	5,391.67
	III	2	67,900	5,658.33
	IV	2	71,500	5,958.33
	V	2	74,600	6,216.67
	VI	2	77,300	6,441.67
Associate Professor	I	2	74,700	6,225,00
	II	2	77,400	6,450.00
	III	2	80,500	6,708.33
	IV	3	82,800	6,900.00
	V	3	85,400	7,116.67
Professor	I	3	82,900	6,908.33
	II	3	85,500	7,125.00
	III	3	90,900	7,575.00
	IV	3	97,400	8,116.67
	V	-	104,800	8,733.33
	VI	-	113,000	9,416.67
	VII	-	121,000	10,083.33
	VIII	-	130,200	10,850.00
	IX	-	141,500	11,791.67

* Last updated October 2004.

c. Faculty Workload

Describe the faculty workload policy for the engineering unit. Define what constitutes a full-time load.

The faculty workload components are defined by the review criteria for merit advancement, promotion, and tenure.

A central pervasive mission of the University of California as well as the Bourns College of Engineering is discovering and advancing knowledge. Thus, a significant portion of a faculty member's time is to be spent on research. Faculty members are expected to engage in meaningful research that contributes to the advancement of knowledge in both fundamental and applied areas of engineering, provides a technical edge for the U.S., and serves as a catalyst for industrial growth in the Inland Empire region of California. This requires faculty members to be highly active in identifying relevant research foci; establishing a network of collaborators and industrial partners; seeking extramural funding to support his/her research efforts; assembling a talented group of undergraduates, graduate students, and post-doctoral researchers; and disseminating their findings at conferences, invited seminars, peer-reviewed publications, and technical reports. Research and professional service are closely aligned. Through his/her research efforts, a faculty member has numerous opportunities to provide professional service.

The nominal faculty teaching workload in The Marlan and Rosemary Bourns College of Engineering is four quarter lecture courses per academic year. Junior faculty will teach fewer courses when possible. Faculty members with a significant service load, e.g. department chair, are also given a lower teaching load. In addition to lecture courses, faculty members are expected to mentor graduate students and undergraduates as part of their individual research endeavors.

Beyond the teaching, research, and professional service components, each faculty member is expected to contribute to the well-being of the department, college, and campus via service. Service opportunities consist of regular and irregular responsibilities. Regular responsibilities include service on department (e.g. faculty search, undergraduate studies, graduate studies) college-wide (e.g. Executive Committee, student club advisor), and Academic Senate committees (e.g. Committee on Educational Policy, Committee on Academic Personnel, etc.). Irregular responsibilities include service at various events such as open house, undergraduate recruitment events, community college workshops, science fair judging, MESA events, etc.

d. Supervision of Part-time Faculty

Describe the policy for the supervision and evaluation of part-time faculty personnel.

Part-time faculty, lecturers, are interviewed and carefully screened before being hired. Within Southern California, there are many well-qualified individuals willing to teach part-time. All lecturers are supervised by a regular faculty member and undergo the same course evaluation process that ladder-rank faculty members undergo. Lecturers are provided with a prescribed syllabus and often with course notes. They are entitled to office space and are expected to hold office hours with students.

7. Engineering Enrollment and Degree Data

Provide enrollment and degree statistics for the engineering educational unit as a whole and for each program being evaluated for the current and preceding five (5) academic years. (see Table II-8)

Table II-8. Engineering Enrollment and Degree Data

Engineering education unit as a whole: (numbers include IS, Freshmen and Transfers)

Year	AY	FT/PT	Enrollment Year					Total UG	Total Grad	Degrees Conferred*			
			1st	2nd	3rd	4th	5th**			BS	MS	PhD	Other
Current	2005	FT	423	237	264	348	2	1274	291	243	108	36	
		PT											
1	2004	FT	547	300	259	411		1517	302	239	27	6	
		PT											
2	2003	FT	512	354	333	455		1654	270	237	19	4	
		PT											
3	2002	FT	594	384	320	451		1749	208	182	20	0	
		PT											
4	2001	FT	666	282	275	393		1616	179	124	16	1	
		PT											
5	2000 ***	FT	529	199	256	287		1272	144	84	7	1	
		PT											

* Total number of bachelor's degrees conferred will not add up to the sum of the number of degrees conferred per program on the department-level tables below because the College of Engineering also awards bachelor's degrees in the Information Systems program, which is not undergoing accreditation review this year.

** Student status is recorded by standing (e.g., freshman, sophomore), not by year, so accurate data for fifth-year undergraduates are unavailable.

*** 2000 has one Limited student. Thus, the total disagrees with the enrollment year numbers total by 1.

Chemical and Environmental Engineering (combined)

(Total for both freshmen and transfers, CHEN and ENEN)

Year	AY	FT/ PT	Enrollment Year					Total UG	Total Grad	Degrees Conferred			
			1st	2nd	3rd	4th	5th			BS	MS	PhD	Other
Current	2005	FT	52	28	37	37		154	55	43	5	5	
		PT											
1	2004	FT	88	16	18	31		153	53	17	5	3	
		PT											
2	2003	FT	35	19	23	31		108	48	52	6	0	
		PT											
3	2002	FT	33	24	18	30		105	36	13	4	0	
		PT											
4	2001	FT	41	14	13	28		96	26	13	1	0	
		PT											
5	2000	FT	27	8	13	22		70	19	12			
		PT											

Computer Engineering

(No graduate program, includes freshmen and transfer)

Year	AY	FT/ PT	Enrollment Year					Total UG	Total Grad	Degrees Conferred			
			1st	2nd	3rd	4th	5th			BS	MS	PhD	Other
Current	2005	FT	66	20	44	32		162		24			
		PT											
1	2004	FT	79	48	31	48		206		20			
		PT											
2	2003	FT	72	62	45	45		224		9			
		PT											
3	2002	FT	95	72	32	25		224		6			
		PT											
4	2001	FT	107	39	19	15		180		3			
		PT											
5	2000	FT	79	14	10	14		117		2			
		PT											

Computer Science

(Includes Freshmen and Transfer)

Year	AY	FT/ PT	Enrollment Year					Total UG	Total Grad	Degrees Conferred			
			1st	2nd	3rd	4th	5th			BS	MS	PhD	Other
Current	2005	FT	61	60	40	119	2	282	124	80	25	8	
		PT											
1	2004	FT	76	69	88	165		398	141	138	22	3	
		PT											
2	2003	FT	122	128	147	240		637	131	115	13	4	
		PT											
3	2002	FT	196	155	181	279		811	103	112	16	0	
		PT											
4	2001	FT	239	155	195	251		840	88	71	15	1	
		PT											
5	2000	FT	227	125	167	176		695	79	44	7	1	
		PT											

Electrical Engineering

(Includes Freshmen and Transfer)

Year	AY	FT/ PT	Enrollment Year					Total UG	Total Grad	Degrees Conferred*I			
			1st	2nd	3rd	4th	5th			BS	MS	PhD	Other
Current	2005	FT	51	34	38	71		194	77	48	72	19	
		PT											
1	2004	FT	51	35	46	68		200	71	29			
		PT											
2	2003	FT	45	28	52	55		180	68	32			
		PT											
3	2002	FT	43	36	27	55		161	51	26			
		PT											
4	2001	FT	46	23	20	54		143	57	24			
		PT											
5	2000	FT	37	22	34	39		132	46	16			
		PT											

***** The numbers indicated under MS and PhD are the total numbers from 2000 to 2005. Breakdown numbers per year were unavailable.

Mechanical Engineering

Program: MCEN (includes Freshmen and Transfer)

Year	AY	FT/ PT	Enrollment Year					Total UG	Total Grad	Degrees Conferred			
			1st	2nd	3rd	4th	5th			BS	MS	PhD	Other
Current	2005	FT	112	58	47	68		285	35	22	6	4	
		PT											
1	2004	FT	112	73	47	53		285	37	22			
		PT											
2	2003	FT	132	62	41	50		285	23	26			
		PT											
3	2002	FT	129	39	35	39		242	18	24			
		PT											
4	2001	FT	79	26	22	41		168	8	13			
		PT											
5	2000	FT	49	20	25	30		124	0	10			
		PT											

8. Definition of Credit Unit

The EAC assumes that one semester or quarter credit hour normally represents one class hour or three laboratory hours per week. One academic year normally represents at least 28 weeks of classes, exclusive of final examinations. If other standards are used by this institution, the differences should be indicated.

Policies at the University of California, Riverside, correspond to these definitions. An academic year consists of three 10-week quarters, or 30 weeks.

9. Admission and Graduation Requirements, Basic Programs

Data and information presented in this section should apply to all programs listed under "Programs Offered and Degrees Granted" as being part of the engineering educational unit. If there are exceptions for any of the programs being submitted for evaluation, note them here and describe each one specifically in the Self-Study Report under "Program Modes" for the program in question.

A. Admission of Students

1. Describe the general criteria and procedures for admitting students to engineering programs.

UCR seeks to recruit and retain an academically strong student body that has demonstrated the rigorous preparation needed for admission to a major research institution and reflects the diversity of our state and region. Admission to UCR requires (1) satisfaction of the University of California minimum admission requirements and (2) selection by UCR according to the principles of Comprehensive Review, as determined by the UCR faculty.

Meeting UC minimum admission requirements will not guarantee admission to UCR. Applicants who seek to increase their likelihood for admission should strive for achievement well beyond UC minimum requirements. Final determination of admission will be made within the context of campus enrollment goals.

There are three paths to satisfying the university's minimum admission requirements for freshman students: Eligibility in the Statewide Context, Eligibility in the Local Context, and Eligibility by Examination Alone.

1. Eligibility in Statewide Context

This is the path by which most students attain UC eligibility. To be eligible in the statewide context, students must satisfy the subject, scholarship, and examination requirements described below.

Subject Requirement Students must complete or have validated 15 units of high school courses to fulfill the subject requirement. At least 7 of those 15 units must be taken or validated in the last two years of high school. (A unit is equal to an academic year or two semesters of study.) This sequence of courses, called the "a-g" Subject Requirement, is as follows:

A. History/Social Sciences ..... 2 years
B. English..... 4 years
C. Mathematics ..... 3 years required, 4 years recommended
D. Laboratory Science ..... 2 years required, 3 years recommended
E. Language other than English ..... 2 years required, 3 years recommended
F. Visual and Performing Arts ..... 1 year
G. College Preparatory Electives ..... 1 year

The University will accept only those "a-g" courses that appear on the official UC Certified Course List for the California high school the student attended. The UC-certified course list is available at www.ucop.edu/doorways/list.

Scholarship Requirement The Scholarship Requirement defines the grade point average (GPA) students must attain in the "a-g" subjects and the scores from the SAT Reasoning Test (or ACT Assessment plus Writing) and SAT Subject Tests that must be earned to be eligible for admission to the university. Students qualifying for admission in the statewide context must present an "a-g" GPA and test score total that meets the criteria on the Eligibility Index in this section.

Honors Courses The university assigns extra points for up to four yearlong university-certified honors level, Advanced Placement, and/or UC-designated International Baccalaureate courses taken in grades 10, 11, and 12: A=5 points, B=4 points, C=3 points. College-level courses in the "a-g" college preparatory subjects that are transferable to the university are also assigned honors grade points. A maximum of two yearlong courses taken in grade 10 are assigned honors points. Grades of D are not assigned extra honors points. (Extra points will be awarded to 10th graders only when they take honors courses that have been certified by the university as honors-level courses.) Acceptable honors-level courses include Advanced Placement courses, specific Standard Level and all Higher Level International Baccalaureate courses, and college courses that are transferable to the university.

Examination Requirement Students must submit the following test scores taken no later than December of the senior year:

- Either the SAT Reasoning Test or the ACT Assessment plus Writing. The critical reading, mathematics, and writing scores on the SAT Reasoning Test must be from the same sitting. Students must report each test score from the ACT Assessment plus Writing and the composite score.
- Two SAT Subject Tests in two different areas: history/social studies, English (literature only), mathematics (Level 2 only), science, or languages.

2. Eligibility in the Local Context
Under the Eligibility in the Local Context (ELC) path, the top 4% of students at each participating California high school are designated UC eligible and guaranteed admission to one of UC's nine general campuses, though not necessarily at their first-choice campus.

To be considered for ELC, a student must complete 11 specific units of the subject requirement by the end of the junior year. The 11 units include 1 unit of history/social science, 3 units of

English, 3 units of mathematics, 1 unit of laboratory science, 1 unit of language other than English, and 2 units chosen from among the other subject requirements. With the assistance of each participating high school, the university will identify the top four percent of students on the basis of GPA in the required course work.

The university notifies ELC students of their status at the beginning of their senior year. A student designated UC eligible through ELC must submit the UC undergraduate application during the November filing period and complete remaining eligibility requirements by appropriate deadlines — including the subject and examination requirements — to be considered fully eligible.

3. Eligibility by Examination Alone
To qualify for Eligibility by Examination, students must satisfy the same examination requirement as students who are eligible in the statewide context. That is, students must complete the ACT Assessment plus Writing or the SAT Reasoning Test, and two SAT Subject Tests. Students must achieve a test score total, calculated according to the UC Eligibility Index, of at least 3450 (nonresidents must present a total of 3550 or higher). Additionally, students who take the SAT Reasoning Test must score at least 580 on each of its three components; students who take the ACT Assessment plus Writing must score at least 25 in mathematics, science, reading and English/writing. All students qualifying by this path must score at least 580 on each of their two SAT Subject Tests.

Students may not qualify for Eligibility by Examination if they have completed a transferable college course in any academic subject covered by the SAT Subject Tests. An applicant who is currently attending high school may qualify for admission to the university by examination alone without completing a high school program.

High School Proficiency Examination If a student does not have a high school diploma, the university will accept the Certificate of Proficiency awarded by the State Board of Education upon successful completion of the California High School Proficiency Examination. The university also will accept proficiency examinations from other states, or the General Education Development (GED) Certificate, in place of a diploma. However, a student must still meet the subject, scholarship and examination requirements.

Nonresidents of California
Two paths to UC eligibility exist for nonresidents at the freshman level. The first is the same as described under Eligibility in the Statewide Context and the second is the same as described under Eligibility by Examination Alone, with the following exception:

Scholarship Requirement Students whose GPA is 3.40 or above satisfy the minimum scholarship requirement if they achieve the test score total indicated in the Eligibility Index under Nonresidents.

In addition to the general UC admissions requirements, the Bourns College of Engineering includes the following criteria:

Algebra.....2 years
Plane Geometry.....1 year
Trigonometry (often contained in Precalculus or Algebra II, strongly suggested) .....1-2 years
Chemistry or Physics, with laboratory (preferably both) .....1 year

2. Provide a history of admission standards for freshmen showing admission standards for students enrolled in engineering programs directly from high school for the current and last five academic years. (see **Table II-9)**

Table II-9 below provides this information.

Table II-9. History of Admissions Standards for Freshmen.

Academic Year	Composite ACT		Composite SAT		Percentile Rank in High School		Number of New Students Enrolled
	MIN*	AVG*	MIN*	AVG	MIN*	AVG*	
2005				1109			292
2004				1096			452
2003				1109			316
2002				1107			414
2001				1103			510
2000				1085			416

* Data not available.

3. Describe how advanced placement course credits are evaluated from programs not accredited by the EAC either at this institution or elsewhere.

As noted earlier, the University assigns extra points for up to four yearlong university-certified honors level, Advanced Placement, and/or UC-designated International Baccalaureate courses taken in grades 10, 11, and 12: A=5 points, B=4 points, C=3 points. College-level courses in the "a-g" college preparatory subjects that are transferable to the university are also assigned honors grade points. A maximum of two yearlong courses taken in grade 10 are assigned honors points. Grades of D are not assigned extra honors points. (Extra points will be awarded to 10th graders only when they take honors courses that have been certified by the university as honors-level courses.) Acceptable honors-level courses include Advanced Placement courses, specific Standard Level and all Higher Level International Baccalaureate courses, and college courses that are transferable to the university.

4. Describe special admission requirements for entry into the upper division or professional programs in the engineering educational unit.

None.

5. Describe the policies regarding admission of transfer students from other institutions to the engineering programs and how these policies are enforced. List such special requirements as minimum grade-point average and course requirements. Describe any general articulation agreements with other

institutions. If the transfer of "D" grades is permitted, explain the circumstances in which this occurs.

Transfer students must meet the following criteria and complete the courses listed below as required for the major you wish to pursue.

General Requirements for All Transfer Admits:

- A cumulative GPA of at least 2.80.
- A GPA of 2.5 or more in a minimum of 2 sequences, excluding English Composition, such as Math 9A, 9B, 9C, or Phys 40A, 40B, 40C.
- Completion of the following course sequences prior to enrollment:
    - One year of college level English Composition (English 1A, 1B, 1C)
    - One year of single variable calculus (Math 9A, 9B, 9C)

Additional Major-Specific Requirements to be completed prior to transfer:

Bioengineering Major (BIEN). The following courses must be completed before enrollment:

- two courses in general chemistry with labs (Chem 1A, 1B)
- one course in introduction to cellular and molecular biology with lab (Biol 5A/LA)

A minimum of THREE (3) additional approved courses from the list below:

- one course in introduction to organismal biology (Biol 5B)
- one course in introduction to evolution and ecology (Biol 5C)
- one course in general chemistry with lab (Chem 1C)
- three courses in calculus based physics with labs (Phys 40A, 40B, 40C)

Chemical Engineering Major (CHEN). The following course(s) *must* be completed prior to enrollment:

- two courses in general chemistry with labs (Chem 1A, 1B)
- one course in calculus based physics with lab (Phys 40A)

A minimum of THREE (3) additional approved courses from the list below:

- one course in general chemistry with lab (Chem 1C)
- one course in introduction to cellular and molecular biology with lab (Biol 5A/LA)
- two courses in organic chemistry with labs (Chem 112A, 112B)
- two courses in calculus based physics with labs (Phys 40B, 40C)

Computer Engineering Major (CEN). The following course(s) *must* be completed prior to enrollment:

- one course in computer programming (CS 10)
- one course in object oriented programming (CS 12)
- one course in calculus based physics with lab (Phys 40A)

A minimum of THREE (3) additional approved courses from the list below:

- two courses in calculus based physics with labs (Phys 40B, 40C)
- one course in introduction to discrete structures (CS/Math 11)
- one course in machine organization and assembly language programming (CS 61)
- one course in engineering circuit analysis I with lab (EE 1A/LA*)

Computer Science Major (ENCS). The following course(s) *must* be completed prior to enrollment:

- one course in computer programming (CS 10)
- one course in object oriented programming (CS 12)
- one course in calculus based physics with lab (Phys 40A)

A minimum of THREE (3) additional approved courses from the list below:

- two courses in calculus based physics with labs (Phys 40B, 40C)
- one course in data structures (CS 14)
- one course in machine organization and assembly language programming (CS 61)
- one course in introduction to discrete structures (CS/Math 11)
- one course in calculus of several variables I (Math 10A)

Electrical Engineering Major (ELEN). The following course(s) *must* be completed prior to enrollment:

- one course in computer programming (CS 10)
- one course in machine organization and assembly language programming (CS 61)
- one course in calculus based physics with lab (Phys 40A)

A minimum of THREE (3) additional approved courses from the list below:

- two courses in calculus based physics with labs (Phys 40B, 40C)
- one course in introduction to ordinary differential equations (Math 46)
- one course in calculus of several variables I (Math 10A)
- one course in engineering circuit analysis I with lab (EE 1A/LA*)
- one course in engineering circuit analysis II (EE 1B)

Environmental Engineering Major (ENEN). The following course(s) *must* be completed prior to enrollment:

- two courses in general chemistry with labs (Chem 1A, B)
- one course in calculus based physics with lab (Phys 40A)

A minimum of THREE (3) additional approved courses from the list below:

- one course in general chemistry with lab (Chem 1C)
- two courses in organic chemistry with labs (Chem 112A, 112B)
- one course in introduction to cellular and molecular biology with lab (Biol 5A/LA)

two courses in calculus based physics with labs (Phys 40B, 40C)

Information Systems Major (IS). The following course(s) *must* be completed prior to enrollment:

- two courses in principles of accounting I, II (BSAD 20A, 20B)
- one course in computer programming (CS 10)

A minimum of THREE (3) additional approved courses from the list below:

- one course in introduction to discrete structures (CS/Math 11)
- one course in object oriented programming (CS 12)
- one course in data structures (CS 14)
- one course in machine organization and assembly language programming (CS 61)
- one course in introduction to macroeconomics (ECON 2)

- one course in introduction to microeconomics (ECON 3)

Mechanical Engineering Major (MCEN). The following course(s) *must* be completed prior to enrollment:

- one course in calculus based physics with lab (Phys 40A)
- two courses in general chemistry with labs (Chem 1A, 1B)

A minimum of THREE (3) additional approved courses from the list below:

- two courses in calculus based physics with labs (Phys 40B, 40C)
- one course in engineering circuit analysis I with lab (EE 1A/LA*)
- one course in introduction to mechanical engineering-problem solving/computation (ME 1C*)
- one course in engineering graphics with computer applications (ME 9)
- one course in statics (ME 10*)
- one course in introduction to engineering computation (ME 18*)

Note: Courses marked with an asterisk (*) are typically not offered at community colleges, but can be taken at UCR during the summer session prior to enrollment.

Highly Recommended Courses for Each Major: In addition to the required coursework above, applicants are strongly encouraged to complete all the recommended courses below prior to enrollment, although they are not required for Transfer Admission. Completing this coursework prior to enrollment at UCR is critical to maintaining normal progress in the upper-division engineering curriculum and to finishing all degree requirements within two years of enrollment at UC Riverside (provided a full-time study load is maintained at UCR).

The most competitive applicants will have completed most of the recommended major preparation courses.

The recommended courses for each major in the Bourns College of Engineering are as follows.

Recommended Courses	BCoE Engineering Major							
	Bio. Engr. (BIEN)	**Chem. Engr. (CHEN)**	**Comp. Engr. (CEN)**	**Comp. Sci. (ENCS)**	**Elect. Engr. (ELEN)**	**Env. Engr. (ENEN)**	**Info. Syst. (IS)**	**Mech. Engr. (ME)**
Biology	5B, 5C	5A/LA [1] 5B, 5C [2]				5A/LA		
Chemistry	1C, 112A, 112B, 112C	1C, 112A, 112B, 112C			1A	1C, 112A, 112B		
Comp. Sci.	10	10	14, 61, 11†	14, 61, 11†		10	12, 14, 61, 11†	
Economics							2, 3	
Electrical Engr.			1A/LA*, 1B*		1A/LA*, 1B*			
Math	10A, 46	10A, 10B, 46	10A, 10B, 46, 11†	10A, 11†	10A, 10B, 46	10A, 10B, 46	10A, 11†	10A, 10B, 46
Mech. Engr.					10	10		1C*, 9, 10*, 18*
Physics	40A, 40B, 40C	40B, 40C	40B, 40C	40B, 40C	40B, 40C	40B, 40C		40B, 40C
Biology elective[3]			2, 3, or 5A/LA	2, 3, or 5A/LA	2, 3, or 5A/LA		2, 3, or 5A/LA	
Hum. & Soc. Sciences**	2 courses	3 courses	3 courses	3 courses	2 courses	4 courses	5 courses	3 courses

Notes:

* These courses are typically *NOT* offered at the community college, but can be taken at UCR during the summer session prior to enrollment.

** Prior to enrollment at UCR, a student can take the indicated number of courses in the Humanities and Social Science areas to fulfill breadth requirements for the Bourns College of Engineering. Students can visit http://www.engr.ucr.edu/studentaffairs/policies/breadth.shtml for an explanation of breadth course requirements and for a complete list of approved breadth courses for the Bourns College of Engineering.

† Computer Science 11 is equivalent to Math 11.

Articulation

The state of California has in place a Master Plan for higher education which recognizes a special role for the community colleges in the state as feeder institutions into the institutions of higher education that are part of the University of California and the California State systems. A series of course articulation agreements form the backbone of this relationship.

Course articulations under the Master Plan are in the form of a series of written agreements developed between two institutions to accept and use a specific course that has been completed on a sending campus to meet a specific course requirement on a receiving campus. Faculty in each discipline review courses to determine comparable content and approve all agreements. The agreements authorize the acceptance of one course "in lieu of" another for transferring students. Articulated courses are not to be construed as "equivalent," but rather as comparable courses, i.e., the content is such that similar outcomes are assured and advancement to the next level of

[1] Biology 5A/LA is required for all Chemical Engineering concentrations
[2] Biology 5B, 5C is required for only the bioengineering concentration within the Chemical Engineering major.
[3] Students can choose to take Biology 2, 3, or 5A/LA to satisfy the biology elective requirement for majors in the Bourns College of Engineering.

instruction is appropriate. Course articulation helps smooth transition and progression through the educational system in California through the transfer of students from one campus to another. It provides a link between faculties, campuses, and segments. Articulation promotes "unity" in the educational system and contributes substantially to the additional three goals stated in the renewed Master Plan, July 1987: "Equity, quality, and efficiency." The implementation of a course articulation mechanism as a part of the transfer function is required to be an institutional priority in support of the total transfer function.

The transfer process is facilitated through a statewide course numbering system for courses called the California Articulation Number (CAN) system. The foundation of the CAN system is discipline-based bilateral articulation agreements. Courses in the system are lower division major preparation core courses and support courses. Inter-segmental faculty committees have created succinct course descriptions in 35 disciplines currently in CAN. This activity has promoted communication and the spirit of cooperation. The descriptions are reviewed by faculty on four-year campuses on two and four year cycles to insure currency and appropriateness of courses for major preparation.

Quality control and the integrity of the CAN System are maintained by an annual review of the courses that have been identified, articulated, and qualified to meet the criteria. This review is facilitated on each campus by an articulation officer who works with the faculty. The CAN System, based on course-to-course articulation, simplifies the identification of transferable lower division major preparation courses. It can be used with a high degree of confidence by students, faculty, and staff.

UC Riverside, and the Bourns College of Engineering have an extensive series of articulation agreements in place with community colleges and other institutions in California, all available online at the website http://www.assist.org. The design of the web interface makes it very easy for students, counselors, and faculty to query the database of articulation agreements and to quickly identify correspondences between courses.

The articulation agreement between feeder institutions in California and various programs in our college are available at http://www.assist.org.

6. Provide a history of transfer engineering student statistics. (see **Table II-10**)

Table II-10. History of Transfer Engineering Students

A. Total Students

Academic Year	Number of Transfer Students Enrolled
2005	35
2004	35
2003	59
2002	58
2001	102
2000	103

B. Chemical Engineering

Academic Year	Number of Transfer Students Enrolled
2005	4
2004	4
2003	4
2002	2
2001	4
2000	3

C. Computer Engineering

Academic Year	Number of Transfer Students Enrolled
2005	2
2004	1
2003	1
2002	4
2001	3
2000	5

D. Computer Science

Academic Year	Number of Transfer Students Enrolled
2005	11
2004	17
2003	31
2002	38
2001	87
2000	85

E. Electrical Engineering

Academic Year	Number of Transfer Students Enrolled
2005	12
2004	9
2003	14
2002	7
2001	3
2000	7

F. Environmental Engineering

Academic Year	Number of Transfer Students Enrolled
2005	3
2004	0
2003	1
2002	0
2001	1
2000	0

G. Mechanical Engineering

Academic Year	Number of Transfer Students Enrolled
2005	3
2004	2
2003	7
2002	3
2001	4
2000	3

B. Requirements for Graduation

1. Describe the process used at the college and/or university levels to certify that graduation requirements complying with EAC criteria have been met by each graduate. Provide a sample of any work sheet or check-off sheet used for this purpose.

The graduation requirements are the combination of University, college, and major requirements particular to the degree being sought by an individual. ABET requirements are folded into the college and major requirements of each undergraduate engineering degree offered by the College. In the creation of each degree, ABET criteria were carefully considered so as to make certain that the specific curricular requirements of each discipline, as well as the categories of math and basic science, engineering topics, and humanities and social sciences, would be satisfied. As established majors are updated, the curricular criteria of ABET continue to be incorporated. The breadth, or college, requirements of the Bourns College of Engineering receive the same treatment in their modification, as well.

By satisfaction of all degree requirements, a student can be assured of satisfaction of ABET requirements as well. The primary tool used in verifying the completion of all graduation requirements is the electronic degree audit of the campus student information system. This computerized degree check compares the course work of an individual student to the Senate-approved, ABET-compatible degree requirements as printed in the *General Catalog* of the institution. The audit is an electronic representation of the degree requirements printed in the *Catalog*, and is maintained annually by the Associate Registrar to reflect any approved degree changes or additions. As in the *Catalog*, the audit includes University, college, and major requirements. It goes beyond this, however, and also identifies the courses which apply toward the satisfaction of each requirement. The audit identifies requirements which have been satisfied and which are still to be completed, allowing for satisfaction of both single course requirements as well as requirements which have a range of acceptable options. This comprehensive approach alleviates the need for separate paper tracking sheets and reduces the human error factor. As such, hardcopy tracking of graduation requirements is no longer done.

Once students file their Applications for Graduation (normally three weeks prior to the beginning of the graduation quarter), the Student Affairs Officer performs a preliminary degree check to assess completion of all University, College, major, and ABET requirements.

Students also have access to their own degree audit via a secure web interface. Bourns College of Engineering students are especially adept at utilizing this tool to assess their own degree progress. The audit takes the place of the preliminary as well as the final degree check that were formerly performed manually. As such, hardcopy tracking of graduation requirements is no longer done.

Upon receipt of final grades, a final degree check is performed, and students are cleared to graduate if they have satisfied all listed requirements. If the requirements are not satisfied, the student is notified by the Registrar's Office and asked to contact their College Office.

UC Riverside is on the quarter system, with three academic quarters to the year. Each quarter consist of ten weeks of instruction and one week for final examinations. The value assigned to a course is determined at the rate of one unit for every three hours of student work required each week. The typical course carries four quarter units of credit.

The cooperative work/study (co-op) mode is not available in the engineering programs at UC Riverside.

The undergraduate programs in the Marlan and Rosemary Bourns College of Engineering are offered only in the traditional day-time mode.

2. If modes other than traditional on-campus instruction are employed in any programs, the additional modes of instruction should be listed and described in relation to the applicable programs. The institutional and/or engineering unit policies under which the alternate modes are offered should be summarized.

Not applicable.

3. Indicate the grade-point average required for graduation. If there are differences in requirements among the regular and alternative program modes, please explain.

All undergraduates must maintain a 2.0 in their cumulative GPA and a 2.0 GPA in their major. The cumulative GPA is only that earned in the University of California system. No other grades are included. The major GPA is defined individually for each engineering discipline, but generally includes the upper-division course work in the major, including the technical electives (even if in a related discipline). Grades below 2.0 may be balanced by grades sufficiently above 2.0 to achieve the desired average, except in English Composition, which permits no grades below C-.

10. Non-academic Support Units

Provide information about units that support only the engineering academic programs.

10 A. Undergraduate Research Program

In 1998, the Boyer Commission of the Carnegie Commission on Higher Education issued a report critical of research universities for not providing undergraduates with "maximal opportunities for intellectual and creative development." Partly in response, the University of California has targeted undergraduate research opportunities as a key mechanism for improving undergraduate education. The Bourns College of Engineering in 2002 created a new position, Director of Undergraduate Research, to organize and maintain a program of undergraduate research opportunities via research assistant opportunities in faculty labs and interdisciplinary centers, summer research experience at other institutions, and summer internships.

The UC perspective is that undergraduate students benefit by pursuing their baccalaureate education at a research university as opposed to a teaching university or a liberal arts college. Students who are immersed in the process of knowledge creation understand and appreciate the culture of research. In that context, we encourage undergraduate research as a means to:

1. Develop in undergraduates an enthusiasm for and ability to do research.
2. Increase availability of undergraduate research experiences.
3. Increase faculty interaction with students outside the classroom.

This program works closely with the Vice Chancellor for Research program to encourage undergraduates to participate in research during the academic year and/or during the summer. Students are provided with meaningful research opportunities in which they work under the supervision of faculty, postdoctoral associates, and graduate students. (This helps build teaching skills among postdocs and graduate students while contributing to the undergraduate's education and skills.) Depending on the lab and the project, undergraduates sometimes create their own individual projects to pursue, and sometimes participate in a larger research effort. We encourage our students to prepare papers and posters on their experiences for the Southern California Conference on Undergraduate Research (SCCUR) and other events that accept

research presentations by undergraduates. SCCUR typically attracts more than 1,000 undergraduates each year from throughout Southern California; UCR was the host of the November 2005 event (see photos).

UCR was the host of the Southern California Conference on Undergraduate Research in November 2005. The event attracted more than 1,000 undergraduates, who gave talks or exhibited posters on their research experiences and findings.

In addition to contributing to retention and advancement, research opportunities open a window to the teaching of ethics. Students learn about the context and consequences of their research while working on projects. Additionally, those who work on projects that involve human or animal subjects must go through our Institutional Review Board training, and they gain experience with the process of establishing and abiding by ethical research protocols. As engineering research continues to blur the line between humans, other organisms, and machines, this will be an increasingly important type of experience for our students to have.

10 B. CE-CERT Research Advancement Program (RAP)

The College of Engineering-Center for Environmental Research and Technology (CE-CERT) has an endowment set aside to support undergraduate student researchers in its laboratories. Historically, we have used these funds to (1) help recruit desirable students as freshmen, thus assuring them of a meaningful freshman research experience and a source of income; (2) leverage Federal funding on research projects that require cost sharing, thus providing one or more undergraduate students with the opportunity to work alongside faculty, graduate students, and staff researchers on Government-supported research projects; and (3) leverage other recruitment incentives and support mechanisms, such as Regents Fellows scholarships.

RAP supports five to eight students per year, in one-year increments of $5,000 each. Typically, a student who starts on a RAP fellowship as a freshman advances to a paid position on another research project later. However, there is no rule requiring that RAP support only freshmen.

All student researchers at CE-CERT, whether supported by RAP or other funds, are encouraged to prepare posters and papers on their work. Since 2003, CE-CERT has conducted an annual undergraduate research conference to highlight its undergraduates' work, named after benefactor

Jim Guthrie. The list of presentations from the most recent event, October 2005, is provided below to give an example of the types of work undergraduates are doing at CE-CERT.

Student Name	Presentation Title
Andrés Aguirre	Flowability Study of Wood-Coal Mixtures
Ahn Vu	Computer Vision Application Using Orthogonal Omni-Directional Cameras
Anthony Oyatayo (Mech. Eng.); Luis A. Gonzalez-Argueta (Elect. Engr.)	Wireless Sensor Networks for Machinery Monitoring Case Study: Application to Gear Systems
Jordan Barta	The Study of Hot Gas Cleanup from the Hydrogasification of High Sulfur Content Feedstock
Christopher Salam	Using the Packed-Bed Column Technique to Quantify and Analyze Bacterial Adhesion
Megan Nix	Electrochemically Functionalized Single-Walled Carbon Nanotube Gas Sensor
Marie Donnelly	Production of Energetic Gases from Commingled Coal and Wood Slurries Using Hydrogasification and Steam Pyrolysis

CE-CERT also supports many capstone Senior Design Projects for College of Engineering students in all disciplines. It should be noted that the Interim Director of CE-CERT, Dr. Matthew Barth, also is the Senior Design coordinator for the Electrical Engineering Department.

10 C. Student Organizations

UCR's rich cultural diversity provides an excellent environment for supporting graduate students from underrepresented groups. The College of Engineering hosts student chapters of numerous professional societies built around technical specialties and ethnic backgrounds. These include:

- Air and Waste Management Association (AWMA).
- American Institute of Chemical Engineering (AIChE).
- American Society of Mechanical Engineers (ASME).
- Association for Computing Machinery (ACM).
- Institute of Electrical and Electronic Engineers (IEEE).
- Linux Users Group (LUG).
- National Society of Black Engineers (NSBE).
- Society of Automotive Engineers (SAE).
- Society of Hispanic Professional Engineers (SHPE).
- Society of Women Engineers (SWE).
- Tau Beta Pi.

Additionally, at the campuswide level, organizations and programs include the African Student Programs; Chicano Student Programs; Native American Student Programs; Asian Pacific Student Programs; Women's Resource Center; Education Opportunity Program/Student Affirmative Action; the Mathematics, Engineering and Science Achievement (MESA) Engineering Program; and the Minority Career Development Program.

These organizations provide an affinity network of graduate and undergraduate students for the Fellows. They hold regular meetings, often with guests speakers from industry or other academic institutions, and thus help the members develop professional contacts that can lead to internships, postdoctoral fellowships, and full-time jobs.