

COLLEGE OF ENGINEERING AND COMPUTER SCIENCE

Support Programs

Internship and Career Services

Career planning services are available through the College of Engineering and Computer Science including professional development workshops, job listings, information sessions, job fairs, and guest speakers from the industry and government. The College of Engineering and Computer Science, with programs accredited by ABET (CAC and EAC) and ACCE, employs a director to assist students in choice of major, career planning, and obtaining career-related experience during their education, and in finding professional-level employment at graduation. Students in engineering, computer science, and construction management are encouraged to take advantage of career and internship services early in their educational process and to obtain experience available in a wide range of business, industry, and government organizations in the greater Sacramento area. Through these opportunities, students gain valuable experience and information about how engineering, computer science and construction management principles are applied in the real world.

Information is available on a wealth of career related topics including demand for engineering, computer science, and construction management majors, salary ranges, corporate contacts, and industry trends. Current job listings can be found on the ECS Career Services website at <http://career.ecs.csus.edu>.

Neysa Bush, Director
ECS, Internship and Career Programs
Santa Clara Hall 1204
(916) 278-7091
nbush@csus.edu (cici@csus.edu)

Computing, Communications, and Academic Technology Services

The College of Engineering and Computer Science's Computing, Communications, and Academic Technology Services unit (abbreviated ECS Computing Services) is the integrated Information and Academic Technology (IT/AT) unit for the College. ECS Computing Services is a part of the Dean's Office and serves all faculty, staff and students of the College. It is the College unit charged with implementing and supporting the ECS Information Technology Plan and provides comprehensive IT/AT support to the College.

This support includes hardware, software, networking, and consulting for both academic and research computing and communications. ECS Computing Services manages all of the College's computing facilities, including servers for academic computing, DB, LMS, cloud storage, and web hosting, as well as 42 Windows 7/10 or Linux workstation-equipped laboratories containing 600+ workstations and the College's local area network. Computer accounts are maintained for approximately 3,000 faculty, staff, students and projects.

The ECS Computing Services unit was founded in 1986 when the College procured its first two minicomputers, a pair of DEC VAX 11/785s. The organization has evolved significantly over the years and today is focused on supporting a highly distributed and virtualized computing and communications environment.

The 42 computer equipped laboratories are located in three buildings occupied by the College - Riverside Hall, Santa Clara Hall, and the first floor of the Academic Information Resource Center (AIRC). Examples of specific labs include: Open Labs, Structures Lab, Mechanical Processes Lab, Service Courses Lab, Operating Systems Lab, Special Projects Labs, Computer Architecture Lab, Network and Communications Lab, Programming Labs, Security and Forensics Lab, Circuit Design Lab, Senior Project Design Labs, Mixed Signal Design Lab, Mechanical Design Lab, Construction Management Lab, Robotics Lab, Environmental Engineering Lab, Digital Signal Processing Lab, Virtual Instrumentation Lab, Biomedical Lab, Graduate Projects Design Labs, Biomechanics Lab, Power Lab, Computer Integrated Manufacturing Lab, Mechatronics Lab, 3D Modeling Lab, Automotive Engineering, and an Energy Systems Lab. General building hours for all labs are 7 a.m. to 9 p.m. Monday through Thursday, 7 a.m. to 5 p.m. on Friday, and 11 a.m. to 2 p.m. on Saturday. ECS students are each given a digital access key that allows them to have 24/7 building and lab access. One of these open labs also houses the ECS Computing Services Help Desk, which is staffed with student consultants and provide faculty, staff, and student support seven days a week during the academic semester.

Standard software packages such as Word, Excel, and PowerPoint are provided and distributed by ECS Computing Services. In addition, department-specific software packages such as MentorGraphics, AutoCAD, ProEngineer, Patran, Synopsys, Labview, and SolidWorks are maintained and supported. Linux and Windows 7/10 are the dominant desktop operating systems in use.

The College has an in-house data center for servers and network infrastructure. There are approximately 30 physical servers in the College Data Center, running Linux or MS Windows Server. Approximately ten of those servers host another 70 customized Virtual Servers in a highly redundant Virtual Center. College servers are available 24/7 from on-campus and off-campus via VPN access, which includes Terminal Services Servers that contain all the applications software installed in college computer labs. The College also maintains numerous multimedia classroom facilities and a internet-based teleconference facility.

Additional information, documentation check-out, forms, centralized printer/plotter output, lab support, and user consulting are available at the Help Desk in the main ECS Computing Services Lab in 2011 Riverside Hall, (916) 278-6690. Further information may also be obtained from the ECS Web page at www.ecs.csus.edu (<http://www.ecs.csus.edu>).

Mike Wimple, Director
ECS Computing Services
Riverside Hall 2011
278-7351

Center for Information Assurance and Security

The mission of the Center for Information Assurance and Security is to advance knowledge of information assurance and security practices through:

- Education, training, and awareness programs in information assurance and security issues and practices.
- Applied research in information assurance and security.
- Developing interdisciplinary programs in information assurance and security.

- Outreach programs to assist our community, including community colleges, K-12 schools, industry, and government in information assurance and security issues.
- Forming collaboration with other education, research, industry, and government institutions as partners.

Isaac Ghansah, Director
Center for Information Assurance and Security
Riverside Hall 2009
278-7659

Cooperative Education Program

The College endorses cooperative education (co-op) as a means to enrich a student's education. Cooperative education relates theory to practice, provides "learning by doing" and connects students with industry. The co-op program provides periods of university study with paid work experience in the student's major field of study. Students are encouraged to participate in the co-op plan by completing at least one four- to six-month work period before obtaining their degree. Credit is granted for successful completion of the co-op requirements. Students interested in the Cooperative Education Program should apply in 1204 Santa Clara Hall.

ECS Internship and Career Services
Santa Clara Hall 1204
(916) 278-6756
careercenter@csus.edu (<http://www.careercenter@csus.edu>)

MESA Engineering Program (MEP)

Santa Clara Hall, Room 1213
(916) 278-6699

Participation in the MESA Engineering (MEP) increases the probability that students will be successful in their engineering coursework. Focusing on the recruitment, retention, and graduation of highly motivated students from educationally and financially disadvantaged backgrounds, MEP emphasizes participation by students from communities with low rates of enrollment in engineering majors.

MEP provides an on-campus home for its members with a large 24 hours-a-day study center that encourages study groups. MEP provides professional development, a freshman orientation course, and counseling. The program assists in the coordination of tutoring, counseling, and professional development services for all students in the College of Engineering and Computer Science.

Office of Water Programs

The Office of Water Programs (OWP) is a self-supported program. OWP provides training, technical assistance, and applied research management services for a variety of water resource and water quality disciplines: drinking water, wastewater, stormwater, watershed planning and soils and groundwater. The mission of OWP is to provide cost-effective solutions for protecting and enhancing water resources, public health, and the environment.

Since 1972, OWP has provided high-quality training programs for operators of water treatment plants, water distribution systems, wastewater collection systems, and municipal/industrial wastewater treatment and reclamation facilities, as well as for pretreatment facility inspectors, environmental compliance inspectors, and utility managers. As an internationally recognized training leader, OWP publishes a

continually evolving library of print, electronic, and online training materials to meet the changing needs of water industry operators, managers and administrators seeking professional development. For the last 20 years, OWP has also provided training, technical assistance and applied research services for stormwater, watershed planning, soils, and groundwater disciplines. OWP collaborates with a number of civil and environmental engineering organizations and California state agencies on various projects related to statewide stormwater management practices. OWP's stormwater experience spans the areas of program management, regulatory compliance, siting and design of treatment devices (including stormwater low impact development [LID]), monitoring planning and oversight, data analysis, modeling, geographic information system (GIS) programming and software tool development.

OWP also serves as the U.S. Environmental Protection Agency (USEPA) Region 9 Environmental Finance Center (EFC), which supports the region's rural, disadvantaged, and tribal communities in financial planning and asset management to better enable funding environmental and public health services in the short term and to better adapt to regulatory, technological and resource changes in the future.

Ramzi J. Mahmood, Director
Modoc Hall 1001
278-6142
www.owp.csus.edu (<http://www.owp.csus.edu>)

Preparation High School

Students entering as freshmen build primarily upon the foundations established in high school: mathematics, physical sciences, computer programming and oral and written communication. High school study for all majors should include:

- Algebra: 2 years
- Plane Geometry: 1 year
- Trigonometry: 1/2 year
- Chemistry: 1 year
- Physics: 1 year
- Mechanical Drawing: 1 year (only for civil and mechanical engineering majors)

Computer literacy and programming, analytic geometry and calculus are desirable.

Transfer

Students transferring from community colleges with at least 65 transferable units including physics, calculus and differential equations, chemistry, computer programming and lower division engineering courses as listed in this catalog for each program, may complete their engineering, computer science or construction management bachelor of science degree programs within four semesters of additional full-time study. Articulation agreements with most of the community colleges in Northern California state exact course equivalencies. Community college counseling staff are prepared to answer questions regarding articulation. Students planning to transfer from community colleges or four-year institutions with upper division standing are advised to parallel closely the appropriate California State University, Sacramento engineering, construction management or computer science program in the lower division. Completion of General Education (GE) requirements before transfer is NOT recommended or desirable, but rather, emphasis should be placed on taking prescribed basic science and engineering

courses. Students should be aware that some of the major requirements also satisfy GE requirements.

Professional Development

Engineering, computer science and construction management students are encouraged to become acquainted with the functions and the branches within their fields to evaluate their own interests and abilities more carefully. For this purpose, student chapters of national organizations have been established in the college. It is to the student's advantage to become affiliated with the technical society in their interest area soon after enrolling in the university. Students with high scholastic achievement may be invited to join Tau Beta Pi, the national engineering honor society or Upsilon Pi Epsilon, the national computer science honor society.

Whenever possible, students should consider summer and part-time employment in a professional organization or an industry related to their major interest. Students are encouraged to take advantage of internship and career services. (See above.) This employment will provide the undergraduate student with practical experience in real world problems. The College's Internship and Career Services Office, working with the faculty and local industry, assists students in securing employment.

Bachelor of Science

Bachelor of Science degree programs are offered in Civil Engineering, Computer Engineering, Computer Science, Construction Management, Electrical and Electronic Engineering, and Mechanical Engineering. The undergraduate engineering programs are accredited by:

Engineering Accreditation Commission of ABET (EAC/ABET)
111 Market Place, Suite 1050
Baltimore, MD 21202-4012
Telephone: (410) 347-7700

The undergraduate computer science program is accredited by:
Computing Accreditation Commission of ABET (CAC/ABET)
111 Market Place, Suite 1050
Baltimore, MD 21202-4012
Telephone: (410) 347-7700

The Construction Management program is accredited by:
American Council for Construction Education (ACCE)
1300 Hudson Lane, Suite 3
Monroe, LA 71201-6054
Telephone: (318) 323-2413

Students in the College of Engineering and Computer Science are required to meet the general education requirements of the University.

Engineering students must satisfy the 16-unit humanities and social science requirement of EAC/ABET. Construction Management students must satisfy the 18-unit humanities and social science requirements of ACCE. Students should consult with their advisers to determine which courses meet accreditation requirements for social sciences and humanities. By choosing carefully, the student can satisfy the University's General Education requirements with these courses.

While the objective of a broad liberal education is served through independent humanities and social science courses, it is recommended that some courses in these subject areas be at an advanced level rather than a selection of unrelated beginning courses. Courses treating such subjects as accounting, industrial management, finance, personnel administration, art and music skills, introductory language, and ROTC

studies do not fulfill the accreditation humanities-social science requirement.

Enrollment in upper division courses offered by the college is normally restricted to students who have satisfactorily completed all lower division requirements and who have been admitted to one of the majors in the college. Within each program, different patterns of study are possible through a judicious choice of electives.

Minor In Engineering

Non-majors in engineering may elect to minor in this field. Minor requirements may be satisfied by completing 21 approved units, of which 12 must be upper division. Students who have not completed the lower division requirements in calculus, including differential equations, physics, chemistry, and a few engineering courses will find it difficult to complete this minor in the four-year program due to the prerequisite requirements of upper division engineering courses.

Students wishing to minor in engineering must have their minor program approved by the Associate Dean of the College of Engineering and Computer Science. The program should normally include:

ENGR 17	Introductory Circuit Analysis	3
ENGR 30	Analytic Mechanics: Statics	3
ENGR 45	Engineering Materials	3
ENGR 110	Analytic Mechanics - Dynamics	3
ENGR 112	Mechanics Of Materials	3
ENGR 124	Thermodynamics	3
ENGR 132	Fluid Mechanics	3

Master of Science

While graduates of baccalaureate programs enjoy successful careers in many aspects of engineering and computer science, graduate study is becoming more desirable for qualified students who expect to practice in research and development, teaching, management and many areas of design.

The MS degree programs offered in the College of Engineering and Computer Science include Civil Engineering, Computer Engineering, Computer Science, Electrical and Electronic Engineering, Mechanical Engineering, and Software Engineering.

In addition, special interdisciplinary studies are possible in selected areas chosen by the student in consultation with the faculty of the College.

The Master of Science programs require a minimum of 30 units of approved graduate study. The option availability of Plan A, B, or C is indicated with each specialization. Refer to the appropriate sections for detailed information concerning admission and degree requirements.

General information on admission requirements and general graduate study regulations are listed in the section, "Graduate Degree Curricula," of this catalog.

Note: Each graduate course is administered by one of the academic departments in the College. Information on these courses may be obtained in any of the academic department sections of the Catalog.

Departments/Programs

Programs of instruction leading to the following degrees offered by the college are listed in the catalog in separate sections.

- Civil Engineering, BS, MS
- Computer Science, BS, MS
- Computer Engineering, BS, MS
- Construction Management, BS
- Electrical & Electronic Engineering, BS, MS
- Mechanical Engineering, BS, MS

Contact Information

Lorenzo Smith, Dean

Kevan Shafizadeh, Associate Dean

Fausta Romo, Administrative Analyst Specialist

Denise Anderson, Administrative Support Coordinator

Suzanne Abshire, Administrative Support Coordinator

ECS Dean's Office

Riverside Hall 2014

(916) 278-6366

www.ecs.csus.edu (<http://www.ecs.csus.edu>)