

COLLEGE OF ENGINEERING AND COMPUTER SCIENCE

Student Success Center Services

The College of Engineering and Computer Science (ECS) Student Success Center (SSC) supports students with their academic, career, and professional development. Holistic support services are provided through major and GE advising, career advising, and by connecting students to other resources on campus. The SSC also offers support through the MESA Program and free tutoring to all ECS majors.

Tschannen Engineering Building - 1200 Wing
Phone: (916) 278-5426
ecs-ssc@csus.edu

Advising Services

The College of Engineering and Computer Science's Advising Office is dedicated to engaging with students to improve student success and enhance each student's academic and career aspirations through meaningful, customized advising services. The Advising Office improves the student experience by facilitating access to needed resources and expands student opportunities to achieve academic success.

The Advising Office offers and staff can provide assistance with the following advising-related topics:

- General Education & Graduation Requirements (GE/GR)
- Lower-division major and pre-major advising
- Course planning
- Interpretation of University academic policies
- Referrals to other campus resources
- Identifying which courses to complete and transfer from Community Colleges
- Upper division course advising from Faculty Advisors

Current services can be found on the [ECS Advising website](https://www.csus.edu/college/engineering-computer-science/student-success/ecs-advising.html). (<https://www.csus.edu/college/engineering-computer-science/student-success/ecs-advising.html>)

ECS Advising, Counseling, and Tutoring Office
Tschannen Engineering Building, Room 1213
(916) 278-5426
ecs-advising@csus.edu

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, assists 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 opportunities can be found on Handshake (<https://www.csus.edu/college/engineering-computer-science/student-success/career-services/career-handshake.html>) via the [ECS Internship and Career Services website](http://career.ecs.csus.edu) (<http://career.ecs.csus.edu>).

ECS Internship and Career Services Office
Tschannen Engineering Building, Room 1204
(916) 278-7091
ecs-career@csus.edu

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 Tschannen Engineering Building or by emailing ecs-coop@csus.edu.

ECS Internship and Career Services Office
Tschannen Engineering Building, Room 1204
(916) 278-7091
ecs-coop@csus.edu

MESA Program

Participation in the Mathematics, Engineering, and Science Achievement (MESA) Program 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, MESA emphasizes participation by students from communities with low rates of enrollment in engineering majors.

MESA provides an on-campus home for its members with a large 24 hours-a-day study center that encourages study groups. MESA 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.

MESA Program Office
Tschannen Engineering Building, Room 1207
(916) 278-6699
ecs-mesa@csus.edu

ECS Peer-Assisted Learning (PAL) Program

The College of Engineering and Computer Science's Peer-Assisted Learning (PAL) is a curricular structure that encourages cross-year support among students. PAL encourages students to learn cooperatively under the guidance of trained students, called PAL Facilitators, who have been very successful in the same course they facilitate, and have been highly trained in group facilitation and pedagogy.

PAL classes are optional 1-unit courses available for students enrolled in gateway engineering courses. During PAL sessions, students who get stuck and ask a question will be asked to dig deep for what they understand on a basic level and then gently guided (via more questions) to higher and higher levels of competence, until they are able to solve the original problem on their own. Students should take a PAL to optimize their performance in their course, enhance their confidence with the material, and engage with other students.

Additional information about the program and how to enroll can be found on the ECS PAL Website (<https://www.csus.edu/college/engineering-computer-science/student-success/peer-assisted-learning/what-is-pal.html>).

ECS PAL Office
Tschannen Engineering Building, Room 1206
(916) 278-6624
ecs-pal@csus.edu

Computing, Communications, and Academic Technology Services

The College of Engineering and Computer Science's Computing, Communications, and Academic Technology Services (ECS CCATS) team is the Information and Academic Technology (IT/AT) unit for the College. ECS CCATS is a part of the Dean's Office and serves all faculty, staff and students in 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 managing hardware, software, networking, and consulting for both academic and research computing and communications. ECS CCATS manages all ECS computing facilities, including servers for academic computing, databases, learning management systems, cloud computing, and web hosting, as well as forty-two Windows or Linux workstation-equipped laboratories containing 600+ workstations.

ECS CCATS supports physical and virtual servers, running Linux or Windows Server. College servers are available 24/7 from on campus and off campus via VPN access. The College also maintains numerous multimedia classroom facilities and a Zoom-based teleconference facility.

General building hours for all labs are 8 a.m. – 5 p.m., Monday through Friday. However, ECS students can access buildings and labs 24/7 via a key fob. One of these labs also houses the ECS CCATS Help Desk, which is staffed with student consultants and provides direct, on-call faculty, staff, and student support. Multiple remotely accessible labs are also supported and available.

Students and faculty who need assistance with computing, communication, or academic technology issues can contact ECS CCATS directly at the Help Desk or visit the offices of our staff which are open and directly accessible to everyone in the College. In addition, there is on-line help available through the [ECS CCATS web page \(https://www.csus.edu/college/engineering-computer-science/computing-services/\)](https://www.csus.edu/college/engineering-computer-science/computing-services/).

CCATS Help Desk
Riverside Hall, Room 2011
(916) 278-2858
ecs-helpdesk@csus.edu

Center for Information Assurance and Security

The College of Engineering and Computer Science's Center for Information Assurance and Security (CIAS) was established in 2005. The mission of the center 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 collaborations with other education, research, industry, and government institutions.

CIAS has been designated as a National Center of Academic Excellence (CAE) in Information Assurance Education (CAE-IA) since 2007. This designation is jointly sponsored by the National Security Agency (NSA) and Department of Homeland Security (DHS). The designation has to be renewed every five years, to ensure the designated institution meets stringent criteria with respect to curriculum, faculty, research, and institution-wide commitment to information assurance practices and education. CIAS has recently been awarded its re-designation as a CAE in Cyber Defense (CAE-CD) for the academic years 2023-2028. The CAE designation was one of the key factors for the National Science Foundation (NSF) to award Sacramento State over \$7 million in funding as part of the CyberCorps® Scholarship for Service (SFS) program to support students in computer science or computer engineering to become cybersecurity specialists for the academic years 2010-2014, and 2023-2028.

Center for Information Assurance and Security
Riverside Hall, Room 3018
cias@csus.edu

Office of Water Programs

The Office of Water Programs (OWP) is a self-supported program providing cost-effective solutions for protecting and enhancing water resources, public health, and the environment. OWP develops and publishes the industry standard in drinking water and wastewater training materials and provides valuable science-based applied research services in California and elsewhere for a variety of water resource and water quality disciplines, including drinking water, wastewater, stormwater, watershed planning, soils, and groundwater.

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 more than two decades, OWP has also provided training, technical assistance, and applied research services for stormwater, watershed planning, soils, and groundwater disciplines. OWP collaborates with

faculty members in economics, business, engineering, and the sciences to complete its funded projects. OWP's experience spans the areas of stormwater program management, stormwater low impact development (LID), water conservation, technical assistance to small disadvantaged communities, and programming and software tool development using geographic information system (GIS) and other data analysis applications.

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.

Both the training and research programs employ student assistants who gain valuable skills and experience under the direction and mentorship of water sector professionals. OWP also offers competitive fellowship opportunities for graduate students in many disciplines.

Office of Water Programs Office
Modoc Hall, Room 1001
(916) 278-6142

Office of Water Programs Website (<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, and students are encouraged to explore and consider joining one or more of the active ECS Student Clubs and Organizations (<https://www.csus.edu/college/engineering-computer-science/ecs-student-clubs-organizations.html>).

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 (<https://www.csus.edu/college/engineering-computer-science/student-success/career-services/>), 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)
415 North Charles Street
Baltimore, MD 21202-4012
Telephone: (410) 347-7700

The undergraduate Computer Science program is accredited by:
Computing Accreditation Commission of ABET (CAC/ABET)
415 North Charles Street
Baltimore, MD 21202-4012
Telephone: (410) 347-7700

The Construction Management program is accredited by:
American Council for Construction Education (ACCE)
300 Decker Drive, Suite 330
Irving, TX 75062
Telephone: (972) 600-8800

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 ECS Associate Dean for Student Affairs. The program normally includes:

Code	Title	Units
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, and Mechanical 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

Kevan Shafizadeh, Dean

Behnam Arad, Associate Dean for Student Affairs

Suzanne Abshire, Resource Analyst

Petronilla Nyamayaro-Emiru, Budget Resource Analyst

Communications Specialist/Executive Assistant to the Dean

Angie Mendoza, Administrative Support Coordinator/Assistant to the Associate Dean

Samantha Gilson, Student Leadership & Outreach Coordinator

ECS Dean's Office

Riverside Hall, Room 2014

(916) 278-6366 / ecs-doassist@csus.edu

College of Engineering & Computer Science Website (<http://www.ecs.csus.edu/>)