UC San Diego

JACOBS SCHOOL OF ENGINEERING
Aiiso Yufeng Li Family Department of
Chemical and Nano Engineering

Chemical Engineering
NanoEngineering

Undergraduate Student Handbook

2025-2026

Welcome to the Aiiso Yufeng Li Family Department of Chemical and Nano Engineering Department!

Congratulations on being admitted to UC San Diego and to the Aiiso Yufeng Li Family Department of Chemical and Nano Engineering in the Jacobs School of Engineering. This student handbook will help you become familiar with your program, requirements, expectations, and processes. For any additional questions or concerns, please contact the Department of Chemical and Nano Engineering Student Affairs Office. For detailed department information, please visit the department website: https://cne.ucsd.edu.

Chemical and Nano Engineering Undergraduate Student Affairs

The Department of Chemical and Nano Engineering Student Affairs Office has an undergraduate advising team to assist students with academic plans, major requirements, and general program questions. The advising offices are located in the Structural & Materials Engineering (SME) Building, 2nd floor, room 241B. All advising questions and inquiries should be submitted via the Virtual Advising Center (VAC)* or discussed in drop-in hours or scheduled appointments. Information in regards to petitions, EASy requests, 199 approval forms, academic plans and tentative schedules can be found on our website.

**For questions regarding general education requirements, students must contact their College Advisors at their College Academic Advising Office.*

Departmental Focus

The Department of Chemical and Nano Engineering specializes in nanoscale science, chemical engineering, and technology. These areas have the potential to make valuable advances in different areas that include new materials, biology and medicine, energy conversion, sensors, and environmental remediation, to name a few. The Chemical Engineering undergraduate program is designed to support and foster chemical engineering as a profession that interfaces engineering and all aspects of sciences (physics, chemistry, biology). The NanoEngineering undergraduate degree program focuses on integrating the nanoscale science, technology, and engineering disciplines necessary for successful careers in the evolving nanotechnology industry.

The Department of Chemical and Nano Engineering offers undergraduate programs leading to B.S. degrees in **Chemical Engineering** and **NanoEngineering.** The Chemical Engineering Program is accredited by the Engineering Accreditation Commission of ABET, under the commission's General Criteria and Program Criteria for Chemical, Biochemical, Biomolecular Engineering. The NanoEngineering Program is accredited by the Engineering Accreditation Commission of ABET, under the commission's General Criteria with no applicable program criteria.

Program Objectives:

The Chemical Engineering (CENG) Program Educational Objectives are:

To produce chemical engineering alumni who, a few years after completing the program:

1. will be employed in a wide range of industrial, professional, and academic environments using their strong technical chemical engineering education and communication skills.
2. work with a strong sense of humanistic values and professionalism such that they can conduct themselves ethically and knowledgeably regarding technological impact in societal issues.
3. work collaboratively in multidisciplinary teams to solve complex problems that may require different approaches and viewpoints.
4. will continue their personal improvement and multidisciplinary development, enabling them to respond to rapidly changing technological environments throughout their career.

The CENG Program's Educational Objectives can be found on the NanoEngineering Department's UC San Diego-hosted website which is accessible to the public at:
https://cne.ucsd.edu/index.php/undergrad-programs/degree/bs-chemical-engineering/abet

The NanoEngineering (NANO) Program is based on a comprehensive curriculum with the essential elements for a strong engineering background. The mission of the NANO Program is to provide a multidisciplinary education in nanoscale science and technology. The Program's Educational Objectives are:

1. NanoEngineering graduates will have a strong technical background, enabling them to be successful in careers that cross traditional areas of applied science and engineering
2. NanoEngineering graduates will be fluent in a multidisciplinary body of knowledge for participating in and seeding new technologies.
3. NanoEngineering graduates will constitute a high-technology workforce with professional, scientific, and technical skills.
4. NanoEngineering graduates will conduct themselves ethically and knowledgeably in a wide range

of professional environments.

The NANO Program's Educational Objectives can be found on the NanoEngineering Department's UC San Diego-hosted website which is accessible to the public at:
https://cne.ucsd.edu/undergrad-programs/degree/bs-NanoEngineering/abet

Chemical Engineering Curriculum Plan

The B.S. program in Chemical Engineering prepares graduates by placing a strong emphasis on the development of communication skills, both written and oral. Experiences are provided which enhance the ability of graduates to work effectively in team efforts. Whether the career goal is industry, or graduate or professional school, the curriculum has a strong emphasis on developing problem-solving skills and the ability to think and learn independently.

The Chemical Engineering curriculum is designed to be completed in four years for incoming first-year students. For transfer students the curriculum will take two-years to complete. All CENG core courses are taught **only once per year** and are scheduled to be consistent with the curriculum shown below. Students are encouraged to follow the curriculum as designed. Every course (except CENG 4, and CENG 199) **must be taken for a letter grade**.

The curriculum includes Technical Electives or an Area of Specialization. These courses help prepare graduates for a career in various fields, rather than solely traditional chemical and petrochemical industries. Students can select three electives in different areas, to enhance breadth of knowledge. However, selecting three courses within the same discipline allows for an area of specialization. All eligible courses are pre-approved.

To receive a B.S. in Chemical Engineering, students must complete 139 units (plus the college general education requirements). The unit breakdown is as follows:

- **General education requirement (varied units)** - Intended to fulfill the general education requirements (G.E.) from respective College.
- **Basic sciences and mathematics (fifty-four units)** – Includes twenty-four units of mathematics, fourteen units of physics, and sixteen units of chemistry.
- **Chemistry core (twelve units)** – Three advanced chemistry electives must be selected from among the pre-approved courses.
- **Chemical engineering core (thirty-three units)** – Covers chemical process modeling, solution thermodynamics, transport phenomena, chemical reaction engineering, process control, and unit operations.
- **Process laboratory and design (sixteen units)** – This requirement is crucial to fulfilling the Chemical Engineering Program (B.S.) goals by providing hands-on and experiential instruction in the areas of project design, unit operations, hazards analysis, ethics, and economic analysis.
- **General engineering (twelve units)** – Covers basics in computer programming, probability and statistics, and instrumentation.
- **Electives in an area of specialization (twelve units)** – Electives are intended to broaden and enhance professional goals. They may be chosen to achieve either breadth or depth in one's education. All electives must be upper-division courses in engineering and are pre-approved.

Incoming Chemical Engineering First-Year Curriculum Plan

All courses are 4-units unless stated below

FIRST YEAR		
Fall	**Winter**	**Spring**
CENG 4 (1 unit)	CHEM 6B	CHEM 6C
CENG 15	MATH 20B	CHEM 7L
CHEM 6A	PHYS 2A	MATH 20C
MATH 20A	G.E.	PHYS 2B
SECOND YEAR		
Fall	**Winter**	**Spring**
CENG 100	**CENG 102**	**CENG 113**
MATH 18	MATH 20D	MATH 20E
PHYS 2C + 2CL (2-units)	Adv. Chem. (1)	Adv. Chem. (2)
G.E.	G.E.	G.E.
THIRD YEAR		
Fall	**Winter**	**Spring**
CENG 101A	**CENG 101B**	**CENG 101C**
CENG 170	**CENG 114**	**A.S./T.E. (1)**
Adv. Chem. (3)	G.E.	G.E.
G.E.		
FOURTH YEAR		
Fall	**Winter**	**Spring**
CENG 120	**CENG 124A**	**CENG 124B**
CENG 122	**CENG 176A**	**CENG 176B**
A.S./T.E. (2)	A.S./T.E. (3)	G.E.
G.E.	G.E.	

CENG 4: This course should be taken in the first Fall Quarter. Students will not graduate without taking CENG 4.

CENG 15: Offered in the Fall and may be offered in the Winter Quarter. If you cannot register for CENG 15 in the Fall, you may enroll in CENG 15 in the Winter.

Chemistry Core: Must be selected from CHEM 41A-C, 130, 131, 132, 114A (or BIBC 100), 114B (or BIBC 102), 120A, 120B,.

Area of Specialization/ Technical Electives (A.S./T.E.) : Electives are intended to broaden and enhance professional goals. They must be upper-division courses in engineering.
Pre-approved courses are listed here:: https://ne.ucsd.edu/undergrad-programs/degree/bs-chemical-engineering/technical-electives

G.E. Courses (various courses): This requirement varies by college and must be discussed with your college advisor.

Incoming Chemical Engineering Transfer Curriculum Plans

Two-Year Plan

FIRST YEAR @ UC SAN DIEGO		
Fall	**Winter**	**Spring**
CENG 4 (1-unit)	**CENG 15**	**CENG 101C**
CENG 100	**CENG 101B**	**CENG 113**
CENG 101A	**CENG 102**	**CENG 170**
MATH 20E	**CENG 114**	Adv. Chem. (1)
G.E.		G.E.
SECOND YEAR @ UC SAN DIEGO		
Fall	**Winter**	**Spring**
CENG 120	**CENG 124A**	**CENG 124B**
CENG 122	**CENG 176A**	**CENG 176B**
Adv. Chem. (2)	Adv. Chem. (3)	G.E.
A.S./T.E. (1)	A.S./T.E. (2)	A.S./T.E. (3)

Three-Year Plan (only with College approval)

FIRST YEAR @ UC SAN DIEGO		
Fall	**Winter**	**Spring**
CENG 4 (1-unit)	**CENG 102**	**CENG 113**
CENG 15	MATH 20E	**CENG 170**
CENG 100	Adv. Chem. (1)	Adv. Chem. (2)
G.E.	G.E.	G.E.
SECOND YEAR @ UC SAN DIEGO		
Fall	**Winter**	**Spring**
CENG 101A	**CENG 101B**	**CENG 101C**
Adv. Chem. (3)	**CENG 114**	A.S./T.E. (1)
G.E.	G.E.	G.E.
THIRD YEAR @ UC SAN DIEGO		
Fall	**Winter**	**Spring**
CENG 120	**CENG 124A**	**CENG 124B**
CENG 122	**CENG 176A**	**CENG 176B**
A.S./T.E. (2)	A.S./T.E. (3)	G.E.

CENG 4: This course should be taken in the first Fall Quarter. Students will not graduate without taking CENG 4.

CENG 15: Offered in the Fall and may be offered in the Winter Quarter. If you cannot register for CENG 15 in the Fall, you may enroll in CENG 15 in the Winter.

Chemistry Core: Must be selected from CHEM 41A-C, 130, 131, 132, 114A (or BIBC 100), 114B (or BIBC 102), 120A, 120B.

Area of Specialization/ Technical Electives (A.S./T.E.) : Electives are intended to broaden and enhance professional goals. They must be upper-division courses in engineering.Pre-approved list.

G.E. Courses: This requirement varies by college and must be discussed with your college advisor.

The following courses are also required for all Chemical Engineering transfer students as a major requirement and to move forward in the major:

***MATH**: MATH 20A-E, 18.*

***CHEMISTRY**: CHEM 6A-C, 7L*

***PHYSICS**: PHYS 2A-C, CL*

NanoEngineering Curriculum Plan

The B.S. program in NanoEngineering is tailored to provide breadth and flexibility by taking advantage of the strength of basic sciences and other engineering disciplines at UC San Diego. The intention is to graduate nanoengineers who are multidisciplinary and can work in a broad spectrum of industries.

The NanoEngineering curriculum is designed to be completed in four years for incoming first-year students. For transfer students the curriculum will take two-years to complete. All NANO courses are taught **only once per year** and are scheduled to be consistent with the curriculum below. Every course (except NANO 4 and NANO 199) **must be taken for a letter grade**. To graduate, students must maintain an overall GPA of at least 2.0 and the department requires at least a C- grade in each major core course.

The curriculum includes five Nano elective courses. Students can select any available upper division non-core Nano classes to meet this requirement.

To receive a B.S. in NanoEngineering, students must complete 137 units (plus the College general education requirements). The unit breakdown is as follows:

- **General education requirements (varied units)** – Intended to fulfill the general education requirements (G.E.) from the respective College.
- **Basic sciences and mathematics (sixty units)** – Includes twenty-four units of mathematics, sixteen units of physics, sixteen units of chemistry, and four units of biology.
- **Engineering Preparation (twelve units)** – Covers basics in computer programming, circuit analysis, and circuits lab.
- **Nanoengineering core (forty-five units)** – 3 one-unit courses and eleven four-unit core courses.
- **Nanoengineering electives (twenty units)** – Must be chosen from among the upper-division NANO courses offered by the department, or a NANO graduate course that has been approved by a student petition.

Incoming NanoEngineering First-Year Curriculum Plan

All courses are 4-units unless stated below

FIRST YEAR		
Fall	**Winter**	**Spring**
NANO 4 (1 unit)*	**NANO 11***	CHEM 6C
NANO 15*	CHEM 6B	MATH 18
CHEM 6A	MATH 20B	MATH 20C
MATH 20A	G.E.	PHYS 2A
G.E.		
SECOND YEAR		
Fall	**Winter**	**Spring**
NANO 20L (1 unit)	**NANO 104**	**NANO 108**
NANO 102	BILD 1	PHYS 2D
CHEM 7L	MATH 20E	G.E.
MATH 20D	PHYS 2C	G.E.
PHYS 2B		
THIRD YEAR		
Fall	**Winter**	**Spring**
NANO 110*	**NANO 107**	**NANO 112**
NE Elective (1)	**NANO 111***	**NANO 115L**
G.E.	**NANO 117**	NE Elective (2)
G.E.	G.E.	G.E.
FOURTH YEAR		
Fall	**Winter**	**Spring**
NANO 119 (1 unit)	**NANO 120A**	**NANO 120B**
NANO 148*	NE Elective (4)	NE Elective (5)
NE Elective (3)	G.E.	G.E.
G.E.	G.E.	G.E.

NANO 4: This course should be taken in the first Fall Quarter. Students will not graduate without taking NANO 4.

NANO 11: In the 2025-26 academic year, NANO 11 will be offered in the Fall. It will return to winter in the following academic years.

NANO 15: Offered in the Fall and may be offered in the Winter Quarter. If you cannot register for NANO 15 in the Fall, you may enroll in NANO 15 in the Winter.

NANO 110: Effective Fall 2025, NANO 110 will now be taken in Year 3 (formerly in Year 4). In the 2025-26 academic year, NANO 110 will be offered in the Winter. It will return to Fall in the following academic years.

NANO 111: In the 2025-26 academic year, NANO 111 will be offered in the fall. Effective Winter 2027, NANO 111 will be moved to winter quarter (formerly offered in fall quarter).

NANO 148: Effective Fall 2025, NANO 148 will now be taken in Year 4 (formerly Year 3).

NanoEngineering Electives (twenty units): This requirement must be chosen from among the upper-division NANO courses (NANO 100 – 199) offered by the Department.

G.E. Courses (various units): This requirement varies by college and must be discussed with your college advisor.

Incoming NanoEngineering Transfer Curriculum Plans

Two-Year Plan

FIRST YEAR @ UC SAN DIEGO		
Fall	**Winter**	**Spring**
NANO 4 (1 unit)	**NANO 11**	**NANO 108**
NANO 15	**NANO 104**	**NANO 115L**
NANO 20L (1 unit)	**NANO 107**	BILD 1
NANO 102	G.E.	NE Elective (1)
MATH 20E		
SECOND YEAR @ UC SAN DIEGO		
Fall	**Winter**	**Spring**
NANO 110	**NANO 117**	**NANO 112**
NANO 111*	**NANO 120A**	**NANO 120B**
NANO 119 (1 unit)	NE Elective (2)	NE Elective (4)
NANO 148	NE Elective (3)	NE Elective (5)

Three-Year Plan (only with College approval)

FIRST YEAR @ UC SAN DIEGO		
Fall	**Winter**	**Spring**
NANO 4 (1 unit)	**NANO 11**	**NANO 108**
NANO 20L (1 unit)	**NANO 15**	G.E.
NANO 102	**NANO 104**	G.E.
MATH 20E	G.E.	G.E.
SECOND YEAR @ UC SAN DIEGO		
Fall	**Winter**	**Spring**
NANO 148	**NANO 107**	**NANO 112**
NANO 111*	**NANO 117**	**NANO 115L**
G.E.	NE Elective (1)	NE Elective (2)
THIRD YEAR @ UC SAN DIEGO		
Fall	**Winter**	**Spring**
NANO 110	**NANO 120A**	**NANO 120B**
NANO 119 (1 unit)	NE Elective (4)	NE Elective (5)
NE Elective (3)	G.E.	G.E.
G.E.	G.E.	G.E.

NANO 4: This course should be taken in the first Fall Quarter. Students will not graduate without taking NANO 4.

NANO 11: In the 2025-26 academic year, NANO 11 will be offered in the Fall. It will return to winter in the following academic years.

NANO 15: Offered in the Fall and may be offered in the Winter Quarter. If you cannot register for NANO 15 in the Fall, you may enroll in NANO 15 in the Winter.

NANO 110: Effective Fall 2025, NANO 110 will now be taken in Year 3 (formerly in Year 4). In the 2025-26 academic year, NANO 110 will be offered in the Winter. It will return to Fall in the following academic years.

NANO 111: In the 2025-26 academic year, NANO 111 will be offered in the Fall. Effective Winter 2027, NANO 111 will be moved to Winter quarter (formerly offered in fall quarter).

NANO 148: Effective Fall 2025, NANO 148 will now be taken in Year 4 (formerly Year 3).

NanoEngineering Electives (twenty units): This requirement must be chosen from among the upper-division NANO courses (NANO 100 –199).

G.E. Courses (various units): This requirement varies by college and must be discussed with your college advisor.

The following courses are also required for all NanoEngineering transfer students as a major requirement and to move forward in the major: ***MATH****: MATH 20A-E, 18,* ***CHEMISTRY****: CHEM 6A-C, 7L,* ***PHYSICS****: PHYS 2A-D,* ***BIOLOGY:*** *BILD 1*

Academic Opportunities

Additional academic opportunities not required in the NanoEngineering or Chemical Engineering curriculum plans are available to undergraduates. The Jacobs School of Engineering, and UC San Diego as a whole, offer a number of student resources to promote a well-rounded and enriching academic experience.

CENG 199 or NANO 199 – How to enroll:

First Quarter

1. The student contacts a faculty member within the department and discusses the possibility of a Special Studies project in the faculty member's field of competence. The faculty member must agree to serve as the faculty advisor for two consecutive quarters of 199 enrollment.

2. The student obtains a **CENG 199 Contract** or **NANO 199 Contract** from our website, and discusses with the faculty advisor the nature of the project, frequency of contact, prerequisite knowledge needed, and the means of evaluation, which is a graded final report. The contract also provides information about receiving credit for two Technical Electives (TEs) or NanoEngineering (NE) Electives upon completion of two consecutive quarters. The contract must be completed, approved, and processed prior to enrolling in a 199 course.

3. After obtaining the faculty member's approval, the student submits the following two forms online through the **Enrollment Authorization System (EASy):**

- **Special Studies course request** (to request to enroll in the 199 course)
- **CENG 199 Contract** or **NANO 199 Contract** form. The 199 Contract form must be uploaded and attached in the "Supporting Documents" field in EASy, along with the Special Studies course request.
  Click **here for instructions on how to submit a Special Studies request and upload documents in EASy**

4. After the request is approved by the faculty and Department Chair, the EASy system will pre-authorize the student to enroll in the 199 course. The student will be notified through email.

5. The student must enroll themself in the 199 course through **WebReg**. Enrollment is not automatic, so the student must check their schedule and confirm their enrollment in the 199 course.

Second Quarter

1. Prior to the start of the second quarter, the student submits another **Special Studies Course request** online through **EASy**. Click **here** for instructions on how to submit a Special Studies enrollment request.

2. After the request is approved by the faculty and Department Chair, the EASy system will pre-authorize the student to enroll in the 199 course. The student will be notified through email.

3. The student must enroll themself in the 199 course through **WebReg.** Enrollment is not automatic, so the student must check their schedule and confirm their enrollment in the 199 course.

4. As discussed previously with the faculty advisor, a required final report must be submitted at the completion of the second quarter. The 199 course is graded on a P/NP basis. In order for 199 credit to be used as a technical elective, the instructor will assign a letter grade on the final report.

5. After completion of the two quarters, the student will submit the following documents online:

- **Undergraduate Student Petition** (requesting to have the work accepted as two TEs or NE Elective courses)
- The graded final report. It must be uploaded and submitted with the **Undergraduate Student Petition.**

6. The petition and final report will be reviewed by the Undergraduate Affairs Committee and Department Chair. If the petition and final report are approved, the student's degree audit will be updated to reflect credit for two TEs or NE Electives.

Internships

There are a range of resources available to assist students in finding an internship relevant to their field of study:

- ➔ The Jacobs School Job & Internship portal allows students to create and upload their own profile and resume, view and apply to a variety of internship opportunities, and gain access to potential employers. https://jacobsschool.ucsd.edu/cap/job-internship
- ➔ The Academic Internship Program offers students an opportunity to apply academic knowledge and analytical skills in professional settings while earning academic credit. https://aip.ucsd.edu/
- ➔ UC San Diego Career Center lists hundreds of internships through both the AIP and Handshake portals. Mico-internships and research opportunities are also available through the career center. https://career.ucsd.edu/

Study Abroad

Unique opportunities to fulfill your Chemical Engineering or NanoEngineering prerequisites, or college G.E.s are available at many host institutions worldwide through the University of California's Education Abroad Program (EAP) or Opportunities Abroad Program (OAP). ***Because of the sequential nature of many of your required courses in the major, timing of your study abroad program will be critical if you plan to graduate in four years***. Careful planning with a department advisor will ensure you are aware of all opportunities available to you in fulfilling department requirements. Complete and submit a petition for each course you plan to take to the Aiiso Yufeng Li Department of Chemical and Nano Engineering for major courses, or to the home department of other courses, the quarter before you leave. For more information, contact the Study Abroad Office at https://studyabroad.ucsd.edu, and meet with one of their advisors. Be sure to return and discuss your plans with your college and major department advisors.

Student Resources and Organizations

UC San Diego
JACOBS SCHOOL OF ENGINEERING

Corporate Affiliates Program (CAP) provides custom services to achieve your corporate goals. Available services include industry access, research, leadership, and employment and internship opportunities. CAP works with some of the top engineering companies.

Academic Internship Program (AIP) allows students to engage in the community and explore careers through experiential learning. Students are given opportunities to engage in research and work in partnerships with different departments, programs, and faculty. Visit their website at aip.ucsd.edu.

idea
engineering student center

IDEA Center supports several programs that promote academic and professional development for undergraduate students across all engineering departments. The IDEA Center provides information on engineering student organizations, success workshops, mentoring and internship programs, and tutoring. The IDEA Center is in Jacobs Hall (EBU-1) Room 1400, or online: https://jacobsschool.ucsd.edu/idea

UC San Diego
CAREER CENTER

UC San Diego Career Center helps students determine and fulfill their career goals. The Center delivers a wide range of services across two programmatic units:

The Career Education and Advising team (CEA) empowers students to develop and utilize their self-awareness, professional development skills, and proven resources to identify and pursue career employment and professional school admission.

The Industry Engagement team (IE) connects students with bona fide career opportunities, as well as experiential positions, including internships, part-time on- and off-campus jobs, work-study positions, and Peace Corps service. Visit their website at: career.ucsd.edu.

UC San Diego
STUDENT HEALTH AND WELL-BEING
Counseling and Psychological Services

Counseling and Psychological Services (CAPS) has been an integral member of the UCSD community since the late 1960's. We are accredited by the International Association of Counseling Services (IACS). Our integrative and student-centered services are designed to support students towards their academic success and personal development and well-being while at UC San Diego. Please visit their website at https://caps.ucsd.edu/.

UC San Diego Basic Needs Initiatives is a collection of services provided by campus partners to work with both undergraduate and graduate students who have concerns with access to Basic Needs resources. The Hub's services are categorized by Food Security, Housing Resources, and Financial Wellness. Please visit their website at https://basicneeds.ucsd.edu/.

AIChE – **American Institute of Chemical Engineers** This student organization aims to promote the professional development of undergraduate and graduate chemical engineers at UC San Diego and to foster a community among its members through social activities, career-building events, and service opportunities. Please visit their website at https://aiche.ucsd.edu.

NETS – NanoEngineering and Technology Society This student organization at UC San Diego is dedicated to building and supporting the NanoEngineering community of students, faculty, and corporate affiliates through academic and professional advancement, social and networking events, and outreach opportunities. Please visit their website at https://netsucsd.weebly.com