Cañada College

ENGINEERING

Comprehensive Program Review Presentation

Engineering Program, Division of Science and Health

March 21, 2025

What is Engineering?

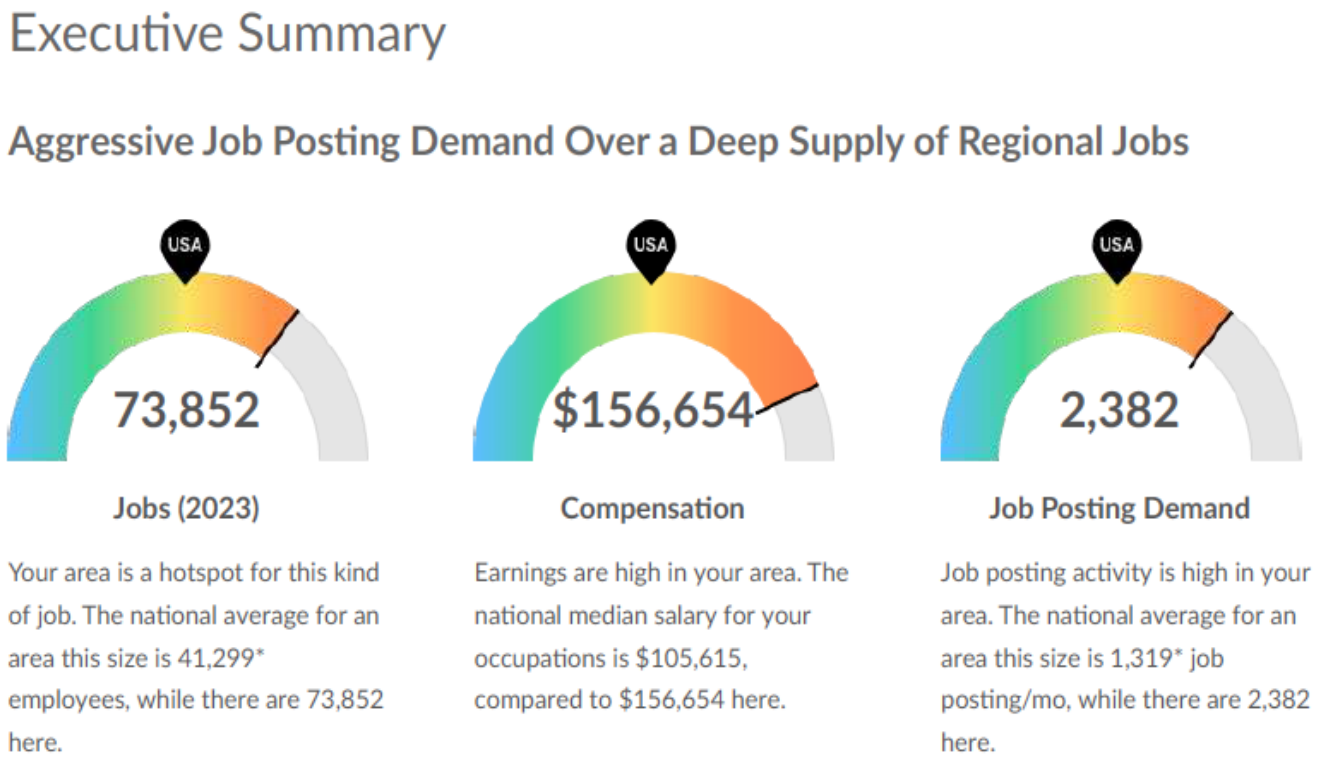
"Engineering is the profession in which a knowledge of the mathematical and natural sciences (Physics, Chemistry, Biology..), gained by study, experience, and practice, is applied with judgment to develop ways to utilize, economically, the materials and forces of nature for the benefit of [hu]mankind."

Engineering is at the APEX of STEM undergraduate studies due to necessary training in math and science

Community & Labor Needs in Engineering

- *Engineering is the largest STEM Profession with > 1M jobs*
- *It is one of the highest paid professions*
- *Local region continues to be strong for engineering jobs*

	Region	Nationwide
Average # Jobs	74k	42k
Median Salary	$156k	$105k



Lightcast Data for Engineering Profession in Region

Region: Santa Clara, Alameda, San Francisco, San Mateo, Contra Costa
Data for: 2023-24

Engineering @ Cañada College

Aligns with College Mission to engage and empower students in transforming their lives and communities through quality education

1. Cañada College's Engineering program is a transfer program that offers the lower-division courses needed by students to transfer to four-year programs in **any** field of engineering.

2. The mission of the program is to educate students from a diverse population to become productive members of the engineering professions and society at large.

3. The department combines excellence in teaching theoretical principles and concepts with practical hands-on experience and the development of technical proficiency and communications skills.

4. The departments work closely with the College's Mathematics, Physics, Computer Science, and Chemistry departments, as well as the College's Student Services Division and four-year engineering programs to maximize students' opportunity for timely completion of courses and successful transfer.

5. Although primarily transfer programs, courses are also available for students who are seeking to update job skills related to engineering as well as through Dual-enrollment program of the SHSD.

6. Engineering students receive academic support services and professional development opportunities from the College's STEM Center (including the Mathematics, Engineering, and Science Achievement (MESA) Program).

Current Engineering Team

Ramki Kalyanaraman, Ph.D.
Professor
Joined: Fall 2019

Lance Lund
Adjunct Instructor

Vinit Shah, Ph.D.
Adjunct Instructor

1 Full time + 1 to 2 Adjunct Faculty/Semester

Academic Programs

A.S. Degree, 60 Units

39-43 Major Units

- 23 CORE Units in Math, Physics Chemistry
- Another 10-12 Units from Math/CS/Chem/Phys

Complete Core Courses, 23 units		Units
CHEM 210	General Chemistry I	5 units
MATH 251	Analytical Geometry and Calculus I	5 units
MATH 252	Analytical Geometry and Calculus II	5 units
PHYS 250	Physics with Calculus I	4 units
PHYS 260	Physics with Calculus II	4 units

Remaining 17-21 Units

- 6-8 Units from ENGR classes
- Rest are Gen Ed

List A, complete 6-8 units from the following:		Units
ENGR 100	Introduction to Engineering	3 units
ENGR 210	Engineering Graphics	4 units
ENGR 215	Computational Methods for Engineers and Scientists	3 units
ENGR 230	Statics	3 units
ENGR 240	Engineering Dynamics	3 units
ENGR 260	Circuits and Devices	3 units
ENGR 261	Circuits and Devices Laboratory	1 unit
ENGR 270	Materials Science	4 units

Approximately 10% of Units are Engineering

Academic Programs

2 Certificates of Achievement

CA in Engineering

Complete Core Courses, 26-28 units		Units
CHEM 210	General Chemistry I	5 units
ENGL 100	Reading and Composition	3 units
	OR	
ENGL 105	Reading and Composition with Support	5 units
MATH 251	Analytical Geometry and Calculus I	5 units
MATH 252	Analytical Geometry and Calculus II	5 units
PHYS 250	Physics with Calculus I	4 units
PHYS 260	Physics with Calculus II	4 units

+

6-8 Units from ENGR classes

CA in Math for Surveying and Computer-Aided Design

Major: Core and Selective Requirements

Complete Core Courses the following courses		Units
CHEM 210	General Chemistry I	5 units
ENGR 210	Engineering Graphics	4 units
MATH 251	Analytical Geometry and Calculus I	5 units
MATH 252	Analytical Geometry and Calculus II	5 units
PHYS 250	Physics with Calculus I	4 units

Total Required Units: 23

Overview of Engineering Classes

Class	NAME	# UNITS	TYPE	Modalities Offered
ENGR 100	Introduction to Engineering	3 units	Lecture + Lab	Hybrid, In-Person, Dual enrolled
ENGR 210	Engineering Graphics	4 units	Lecture + Lab	Hybrid, In-Person
ENGR 215	Computational Methods for Engineers and Scientists	3 units	Lecture + Lab	Hybrid, In-Person
ENGR 230	Statics	3 units	Lecture	Remote, In-Person
ENGR 240	Engineering Dynamics	3 units	Lecture	Remote, In-Person
ENGR 260	Circuits and Devices	3 units	Lecture	Remote, In-Person
ENGR 261	Circuits and Devices Laboratory	1 unit	Lab	In-Person
ENGR 270	Materials Science	4 units	Lecture + Lab	Hybrid, In-Person

- 8 Classes/24 Units
- 5 of 8 or ~63% have Labs

- All Classes are TRANSFERRABLE

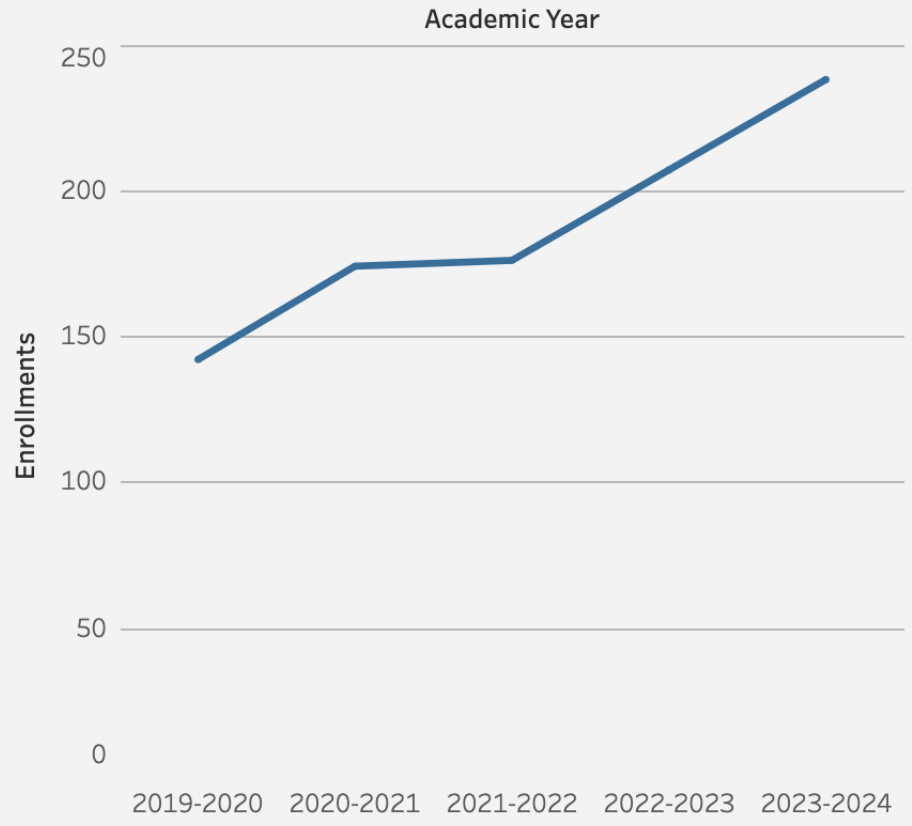
- 3 ZTC/OER classes
- 1 LTC class

Other Activities:
NSF TRABAJO GRANT
Engineering & Robotics Club
Photonics and Laser Technology Certificates

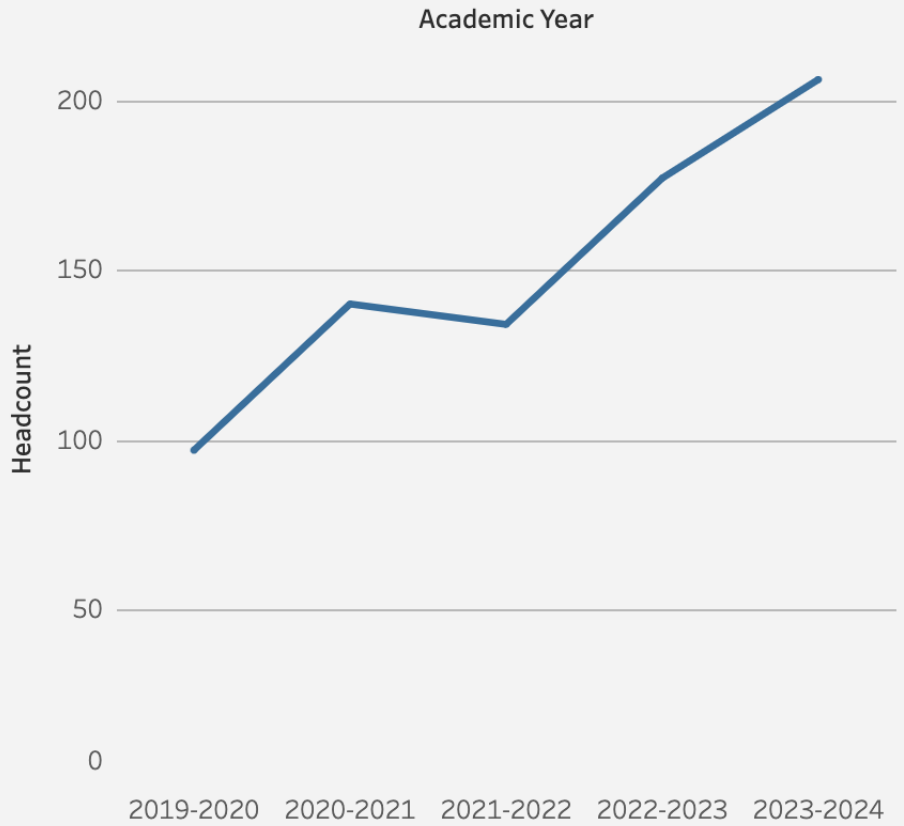
Program Data

Enrollment and Headcount

Enrollment chart



Headcount chart



- ENGR Enrolls high Hispanic Student % (64.8% over 2019-24)
  - College wide is 54.5%

- Enrollments steadily increasing since 2019 (~68% Increase since 2019)
- Headcounts have more than doubled since 2019 (~112%)
- CONSISTENT OFFERING OF CLASSES/SECTIONS IS A BIG REASON!

Equity & Access: Success Rates

Success is enrollment that results in A, B, C or P

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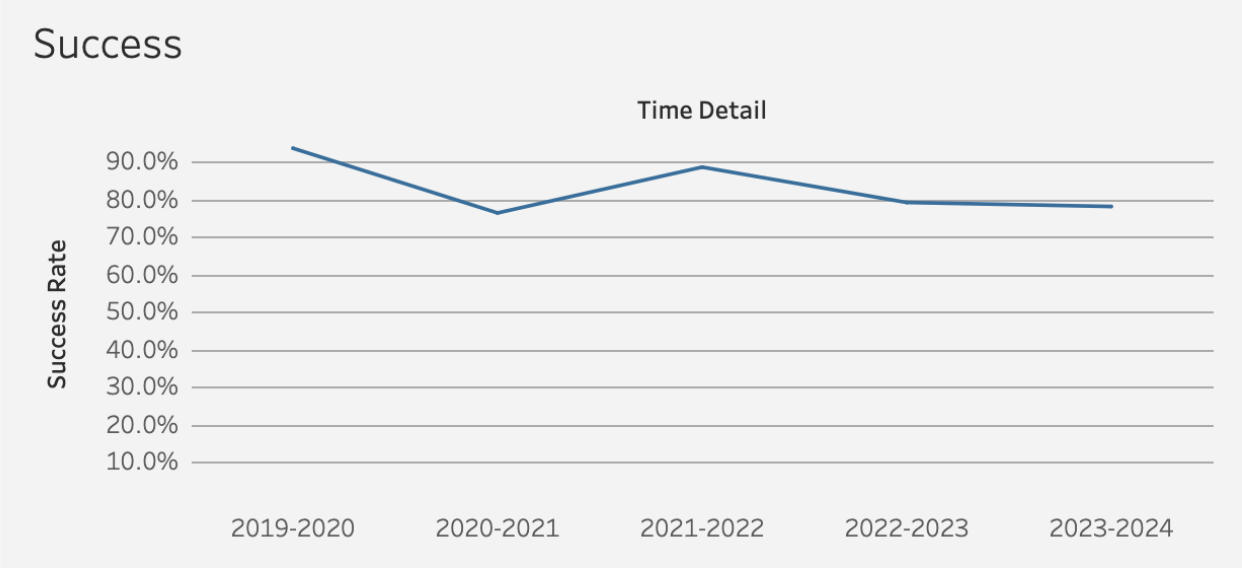

ENGR Average 5-year Success rate ~78.2%

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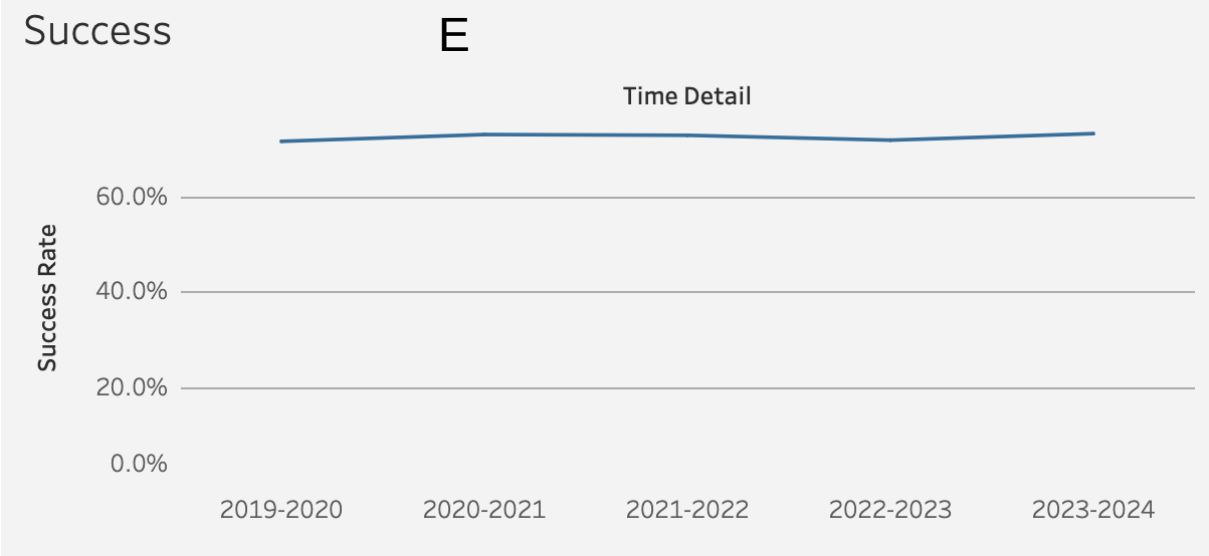

College-Wide average 5-year Success rate ~73%

Equity & Access: Retention Rates

Retention is enrollment that results in a grade but not withdraws or drops

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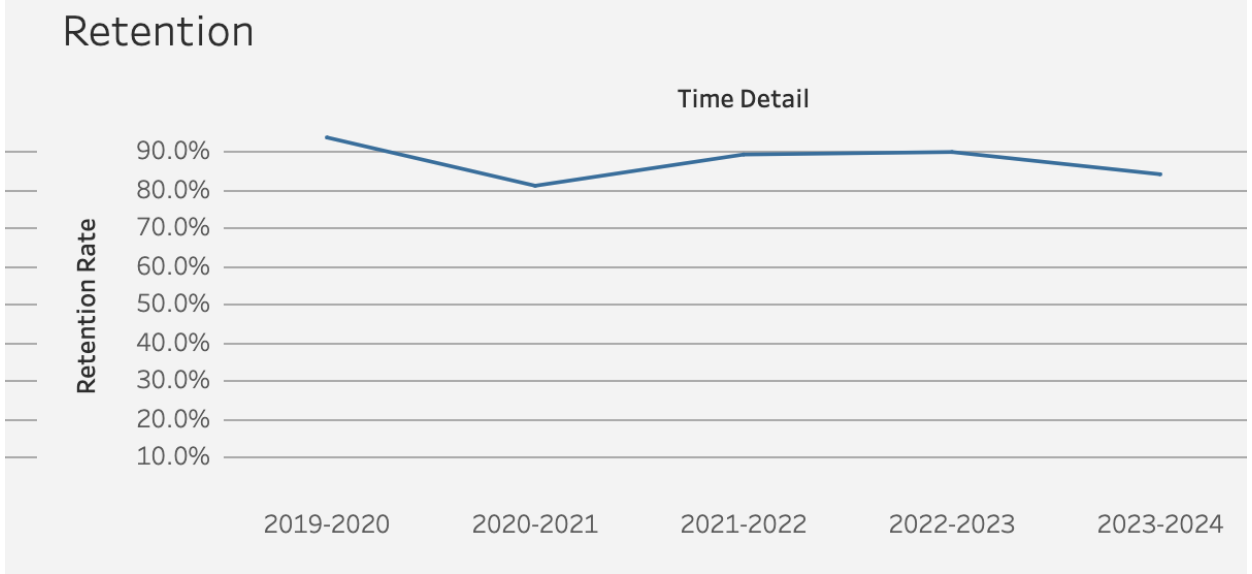

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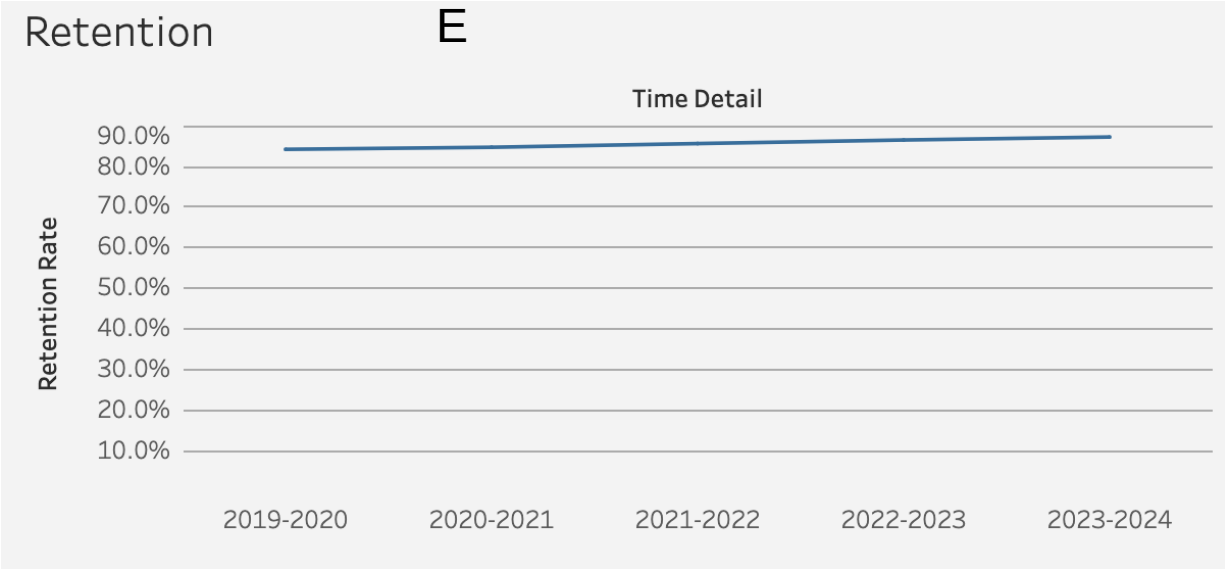

ENGR Average 5-year Retention rate ~90%

College-Wide average 5-year Retention rate ~85%

Success Rates for Hispanic Students

Success is enrollment that results in A, B, C or P

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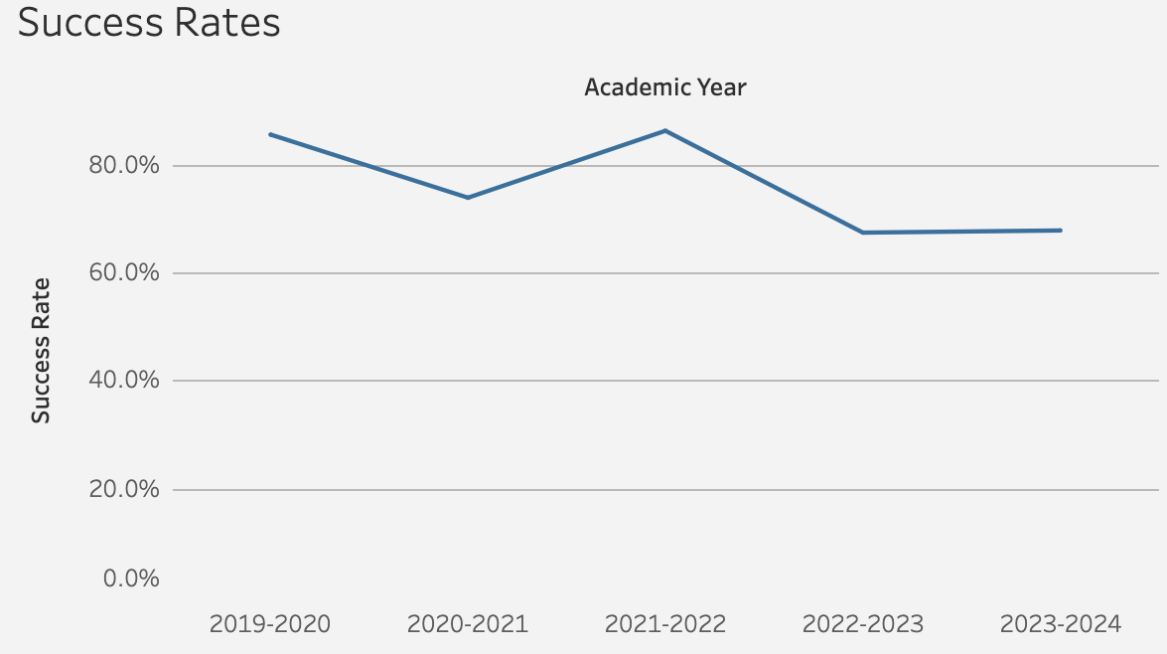

ENGR Average 5-year Success rate ~82%

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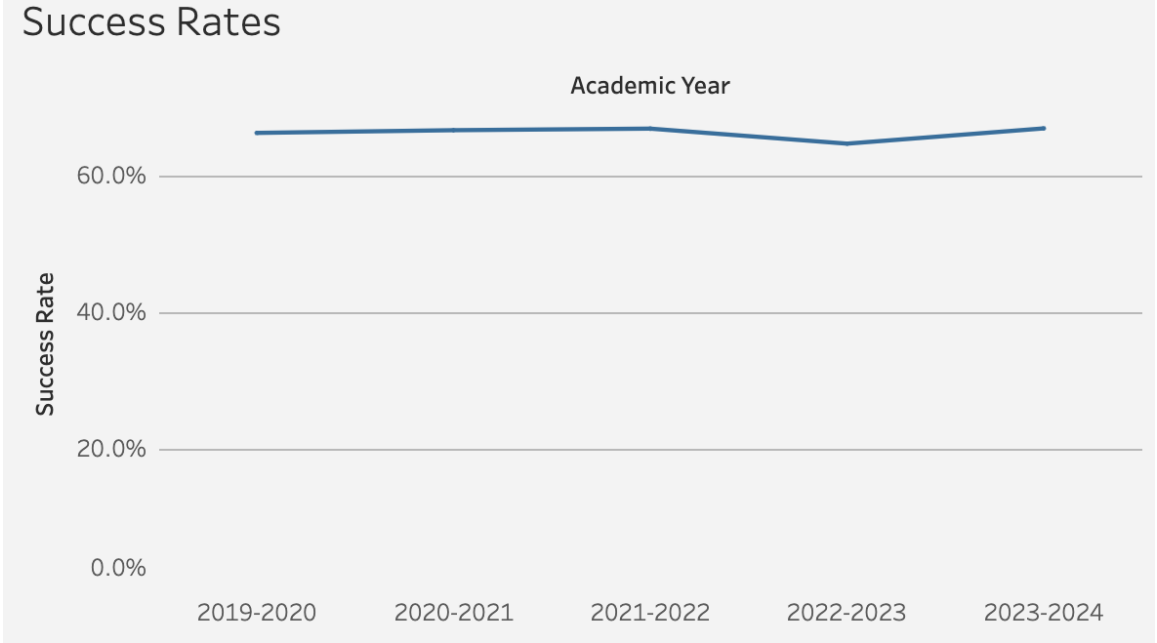

College-Wide average 5-year Success rate ~67%

Opportunities

in Engineering

Strategies to Continue Upwards Trajectory

- Current AS Degree has only 6-8 units of ENGR requirement
  - This is only about 10% of entire AS degree of 60 units
- Engineering is a HIGH UNIT program
  - At least 23-28 units of non-engineering pre-reqs are needed
- Lack of student Cohorts!
  - Students take classes across district

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- Will Propose Curriculum Changes in Fall 2025 to address Units
- Need Flexibility with class size offering! Grateful for Support of Admin
- Collaborate with Counseling
- Increase Dual-enrolled offerings
- Update adjunct pool

Thank You / Any Questions?

Cañada College

Admissions Academics Student Life Student Services About Cañada

Engineering

Cañada College's solar farm produces more than a million watts of clean energy per year.