

2024-2025 Comprehensive Instructional Program Review - Engineering Design Technology Latest Version

Self-study template for Instructional Program Review process. Visitation Year: 2024-2025. Review period: 2018-2019, 2019-2020, 2020-2021, 2021-2022, 2022-2023, and 2023-2024.

Section 1. Program Overview

A. Mission Alignment : Version by Micic, Miodrag on 04/22/2025 02:18

1. Explain how your program supports the College's Mission and Students First Framework (<https://www.cerritos.edu/students-first-framework/default.htm>).

The Engineering Design Technology (ENGT) program at Cerritos College plays a vital role in supporting both the College's mission and the Students First Framework (SFF) by offering comprehensive education, promoting equitable access, fostering career readiness, and contributing to the institution's sustainability. Through its structured curriculum, the ENGT program aligns with the college's strategic objectives by preparing students for direct employment in high-demand industries while ensuring education remains accessible to a diverse population. The mission of Cerritos College emphasizes delivering high-quality instructional programs, cultivating cultural competency, and fostering community engagement. The ENGT program fulfills these goals by offering students the opportunity to master industry-standard technologies such as AutoCAD, SolidWorks, and Inventor. Students receive hands-on training in prototype development, 3D modeling, and advanced design techniques, ensuring they graduate with the practical skills required for roles in aerospace, automotive, and manufacturing industries. The curriculum promotes teamwork and collaboration, equipping students with the technical and interpersonal skills needed to thrive in today's fast-paced work environments and actively contribute to their local and global communities.

The ENGT program exemplifies equitable access by welcoming students from various backgrounds, including underrepresented groups, and offering a seamless pathway into technical careers. A key feature of the program is its dual enrollment initiative, where high school students taking Project Lead The Way (PLTW) engineering technology courses can transfer those classes to Cerritos College through a network of articulation agreements with local high schools. Additionally, credits earned at Cerritos College can transfer back to high schools, allowing students to fulfill both high school and college requirements simultaneously. This initiative accelerates student progress, reduces financial burdens, and encourages early engagement with technical education, setting students on a path to career success.

A major strength of the ENGT program lies in its ability to prepare students for high-paying jobs, often with no need for internships or apprenticeships. Graduates are trained to a level that allows them to enter the workforce immediately, with many securing employment at leading companies such as SpaceX, Northrop Grumman, and Boeing. Notably, all ENGT graduates earn a living wage, in many cases, these earnings exceed those of graduates from master's programs in liberal arts and related fields. The program's effectiveness is reflected in Perkins Indicator IV, which measures employment outcomes and demonstrates the significant contribution the ENGT program makes toward placing students in well-paying jobs. Remarkably, some students find employment after completing just one course. For example, students who complete ENGT259 (SolidWorks) or ENGT251 (Composites Manufacturing) are often able to secure jobs immediately, thanks to the demand for these specialized skills in industries such as aerospace, automotive, and manufacturing. This reflects the practical relevance of the curriculum and the high regard in which employers hold Cerritos College's ENGT program.

The program also plays a crucial role in the institutional health of Cerritos College. It maximizes resources by offering well-equipped labs and access to industry-standard software, ensuring students have the tools needed to excel. Faculty continuously refine the curriculum using labor market data and Perkins reports to align courses with industry trends and maintain the program's relevance. This commitment to continuous improvement supports the college's sustainability by ensuring that its programs remain aligned with workforce demands and contribute to the region's economic development. By attracting a diverse student body and equipping them with high-demand skills, the ENGT program contributes significantly to the local economy. Graduates not only secure employment but also become active contributors to industries that are vital to both local and global markets. The program's success in producing job-ready graduates without additional industry-based training distinguishes it as a leader in technical education, exemplifying Cerritos College's commitment to providing practical pathways to career success.

In conclusion, the Engineering Design Technology program at Cerritos College serves as a cornerstone of the institution's mission and strategic framework. Its innovative dual enrollment initiatives, focus on industry-aligned training, and ability to place students directly into well-paying jobs make it a model for technical education. Through its alignment with both educational and labor market needs, the ENGT program empowers students for meaningful careers and lifelong learning, while strengthening Cerritos College's reputation as a leader in career and technical education.

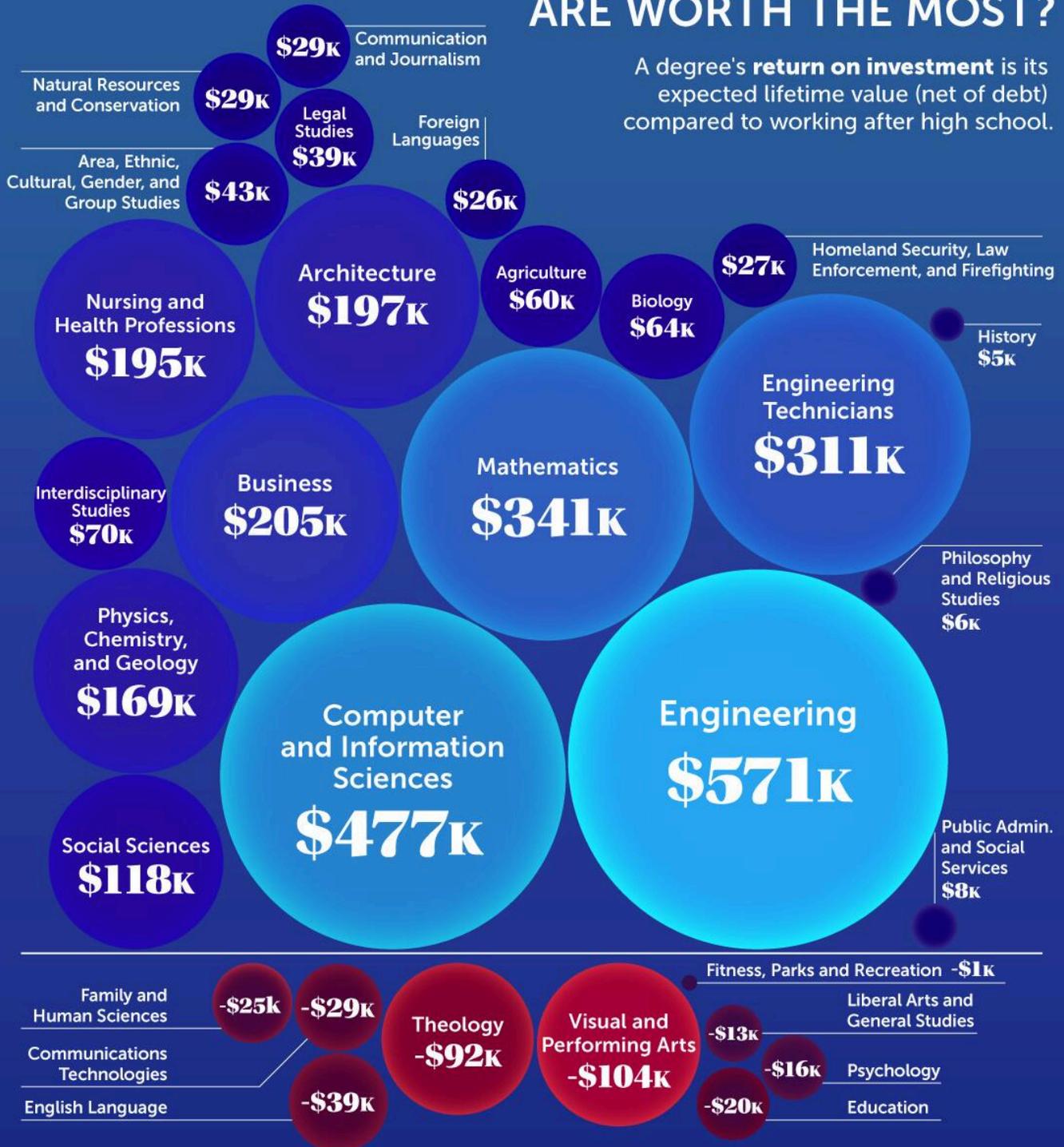
In the pursuit of higher education, prospective students often grapple with the critical question: which degrees offer the best return on investment (ROI)? The recent infographic titled "Which Degrees Are Worth the Most?" provides compelling insights into this dilemma, showcasing the net present value (NPV) of various degree paths. Among the standout programs are those in engineering technology, where degrees and certificates in this field boast some of the highest NPVs available.

Which Degrees



ARE WORTH THE MOST?

A degree's **return on investment** is its expected lifetime value (net of debt) compared to working after high school.



Source: CollegeNPV



Where Data Tells the Story



Figure 1. Net Present Value of the Degrees, (nationwide average).

The infographic presents average NPVs for various four-year degree programs, shedding light on the financial benefits of pursuing higher education compared to entering the workforce directly after high school. Notably, engineering technology pathways, ie pathways for engineering technicians and engineers, demonstrate significant financial advantages. According to the data illustrated in the infographic, engineering technology degrees yield a higher ROI than many other fields of study. The infographics presents mixture of bachelor and associate degrees profession. It is to note that at the associate levels the engineering technology is the best return on investment, while at the bachelor level, it is the engineering degree. The average NPV for engineering technicians, which requires usually two years of post secondary education, is impressive, with a value of approximately \$311,000 and what is more impressive is that it only needs two years of life time investment to achieve it. This data emphasizes that students graduating with two-year degrees in engineering technology not only enter the workforce sooner but also enjoy substantial financial returns that rival or surpass those of four-year degree holders in many other disciplines. Cerritos College Engineering Design Technology department and its programs stands out as a beacon of opportunity for students interested in engineering technology. The programs equip students with practical skills and knowledge that align with industry demands, ensuring that graduates are well-prepared for successful careers as engineering technicians and engineers. The institution's focus on hands-on learning and real-world applications allows students to transition seamlessly into the workforce, capitalizing on the high NPV associated with their degrees.

When placed alongside other degree programs highlighted in the infographic, engineering technology emerges as a leader in ROI. For instance, while degrees in mathematics and computer science show strong NPVs of \$341,000 and \$477,000 respectively, the engineering technology pathways still maintain a competitive edge, particularly when considering the shorter duration of study for two-year degrees. Same applies for the 4 years engineering degree with an ROI of \$571,000 for which average Cerritos College freshmen will need about 8-9 years to complete due to lack of advanced math and physics prerequisites, which are not required for the engineering technology degrees.

The data presented in the infographic clearly indicates that pursuing a degree in engineering technology, is a prudent investment for students. With some of the highest net present values among all fields of study, and definitely shortest time to complete with other high NPV fields, engineering technology not only promises substantial financial returns but also offers fulfilling career opportunities in high-demand professions. As the workforce continues to evolve, the skills and knowledge gained through these programs will be invaluable, ensuring that graduates are positioned for success in an increasingly competitive job market.. Cerritos College ENG T graduates are highly competent and competitive and highly paid. This is reflected in the Perkins Core 4 indicator, where ENG T (drafting) shares the first place with automotive in employability

Employment		
TOP Code	Program Title	Core 4
0948.00	Automotive Technology	96.1
0953.00	Drafting Technology	96
0956.50	Welding Technology	95.77
1230.10	Registered Nursing	94.12
0201.00	Architecture	91.67
1240.20	Dental Hygienist	91.43
1222.00	Physical Therapist Assistant	91.3
1240.10	Dental Assistant	89.47
2105.00	Administration of Justice	88.24
0956.30	Machining & Machine Tools	88.24
0506.00	Business Management	88.08
1402.00	Paralegal	86.21
1221.00	Pharmacy Technology	86.21
1208.00	Medical Assisting	85.71
0508.00	International Business	83.33
0514.00	Office Technology (BCOT)	81.82
1220.00	Speech Language Pathology & Audiology	81.82
0502.00	Accounting	78.69
1305.00	Child Development	76.85
0708.10	Computer Networking	75
0949.00	Automotive Collision Repair	70.59
0511.00	Real Estate	70.37
0952.50	Mill and Cabinet Work (Woodworking)	70
3007.00	Cosmetology	69.94
1306.30	Culinary Arts	69.23
0707.10	Computer Programming	64.71
1005.00	Commercial Music	62.5

Fig 2. CTE Perkins V Core 4 Employability indicator, one year after graduation, % working with living wage

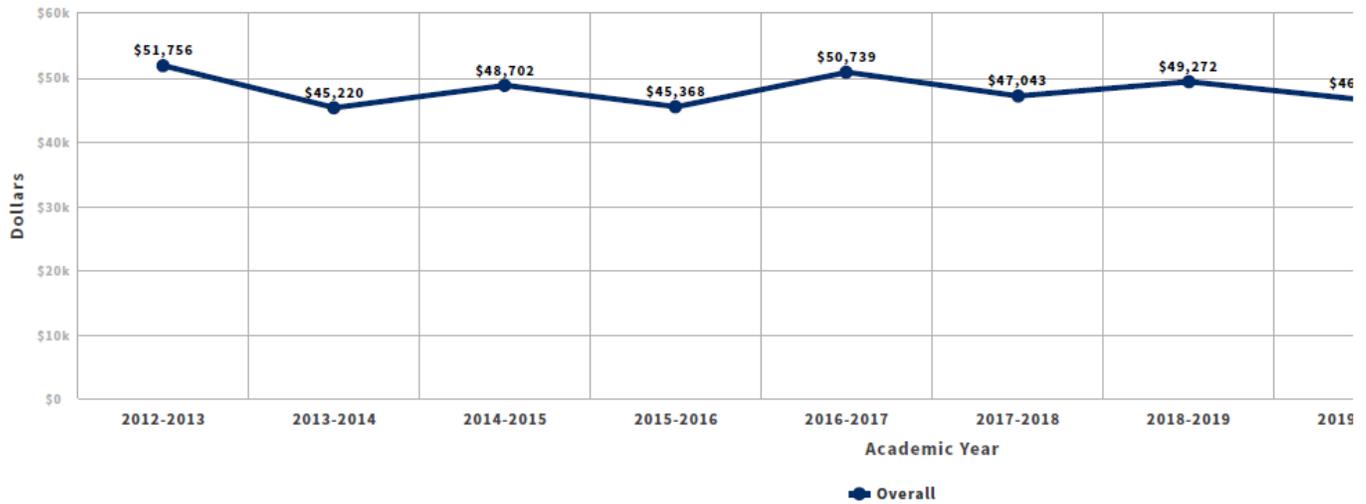


Fig 3, SWF, Strong Work Force data on average salaries of ENGT graduates (data is missing for the last 3 years).

Taking the ENGT program or few other technical and medical related CTE programs is the shortest and fastest way for someone to rise out of poverty to the middle class living standards. As such, ENGT department at Cerritos College is one of the beacons of social mobility for students and for achieving living wage and moving to the next stage in life.

B. Degrees and Certificates : Version by Micic, Miodrag on 10/25/2024 08:05

Degree	Type (Cert., AA, AA-T, AS, AS-T)	Units or Courses Required
Engineering Design Technology	AA	60
Engineering Design Technology	Cert	20-23
Engineering Design and Production Technology	AA	60
Engineering Design and Production Technology	Cert	23-23.5
Engineering Technology	AA	60
Engineering Technology: Electrical and Electronic Engineering Design Technician	Cert	14-15
Engineering Technology: Mechanical Engineering Design Technician	Cert	16-18
Engineering Technology: Mechanical Engineering Technician	Cert	27
Engineering Technology: Industrial Engineering Technician	Cert	26
Engineering Technology: Industrial Arts Education	AS	60
Engineering Technology: Electrical and Electronic Engineering Technician	Cert	25
New Product Development and Fabrication Option	AS	60
New Product Development and Fabrication Option (A.S)	Cert	21
New Product Development: Automotive Aftermarket Product Development Option	AS	60
New Product Development: Automotive Aftermarket Product Development Option	Cert	16-17
Plastics Manufacturing	AS	60
Plastics Manufacturing	Cert	17-18
Composite Inspection	AS	60
Composite Inspection	Cert	17-18.5
Composites Manufacturing	AS	60
Composites Manufacturing	Cert	17-18.5
Composites Tools Design	AS	60
Composites Tools Design	Cert	22

Section 2. Program Trends

A. Program Data : Version by Micic, Miodrag on 04/22/2025 02:18

1. Describe your student demographics (race/ethnicity, gender, age, and others that might be relevant). Consider the following questions when writing your response:

- How do the demographics of your program and its related courses compare with the college as a whole?
- Have they changed over time?

The Engineering Design Technology (ENGT) program at Cerritos College reflects the diversity of the region it serves, with student demographics closely aligning with the ethnic composition of the surrounding communities. A significant portion of the ENGT student body is Hispanic/Latino, mirroring the population of the service area. This strong representation highlights the program's success in engaging a community that has historically been underrepresented in engineering and technical fields. Hispanic/Latino students form the backbone of the program, demonstrating Cerritos College's commitment to equitable access to technical education. In addition to its large Hispanic/Latino student base, the program also serves White, Asian, and Black/African American students, though their representation varies. White students make up the second-largest group, though their participation has fluctuated, particularly during the COVID-19 pandemic. Asian students constitute a smaller portion of the student body, reflecting the program's inclusiveness. Black/African American enrollment has historically been low, but this trend is expected to shift with the launch of the college-wide GoPass initiative, which provides free bus passes to students from neighboring districts such as Compton and Santa Fe Springs. This initiative aims to remove transportation barriers, making Cerritos College more accessible to African American students and increasing their participation campus wide, across all academic pathways. While this initiative has laid important groundwork for broader participation in Career and Technical Education (CTE) programs like Engineering Design Technology (ENGT), its direct impact on increasing African American enrollment in ENGT has so far been limited. Although there has been modest growth in enrollment from other ethnic groups, African American student participation remains disproportionately low. The GoPass program is in its initial stage and should be recognized as a valuable foundational effort that supports access, but it must be complemented by more targeted outreach, active counselor engagement, and hands-on recruitment strategies to significantly improve diversity and representation within the ENGT program.

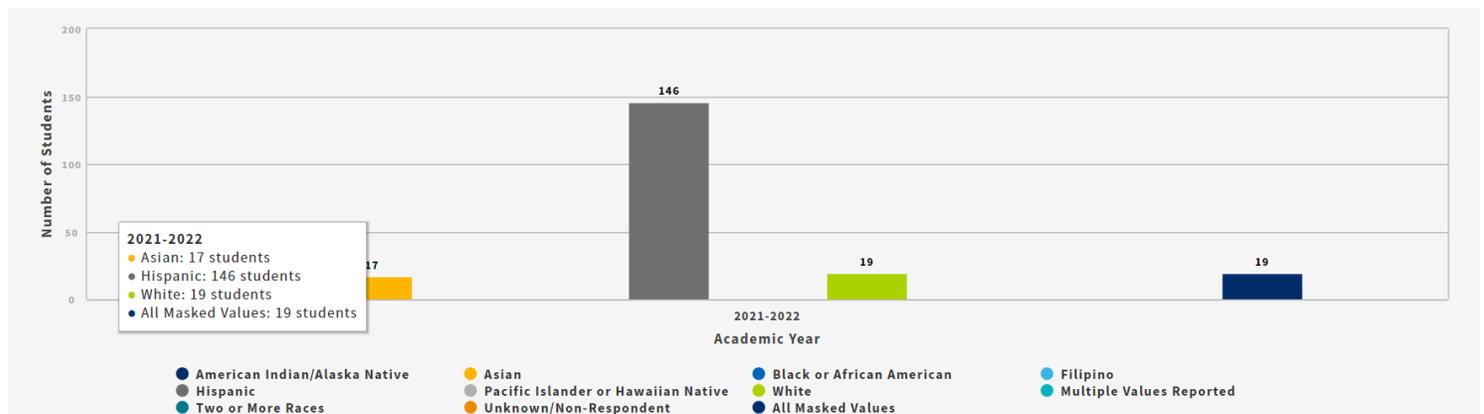
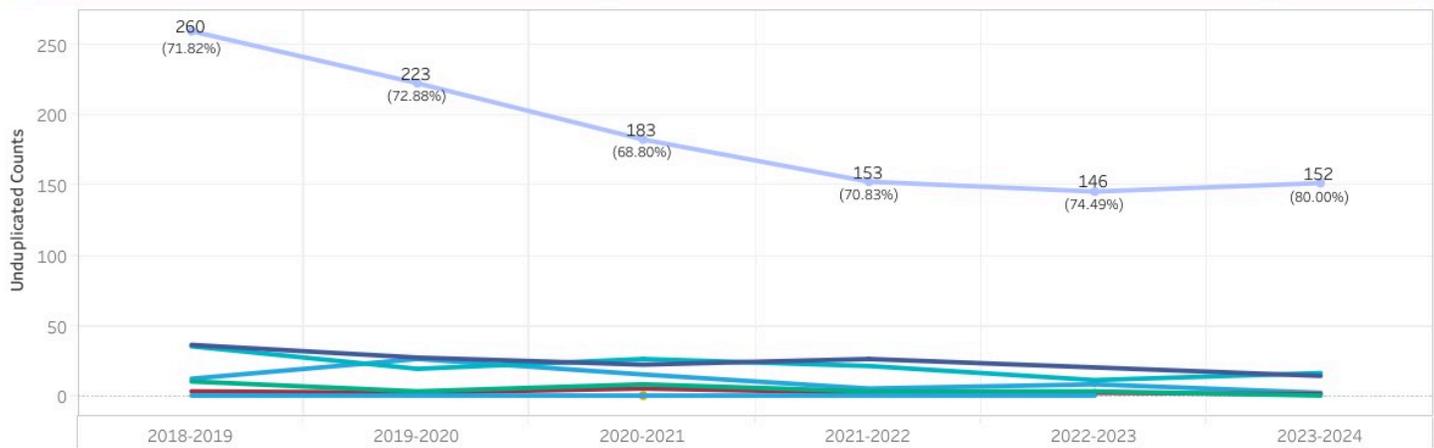


Figure 4 Diversity of ENGT students body, per SWP data for students taking 12 or more units.



Unduplicated Headcounts



Population: All students

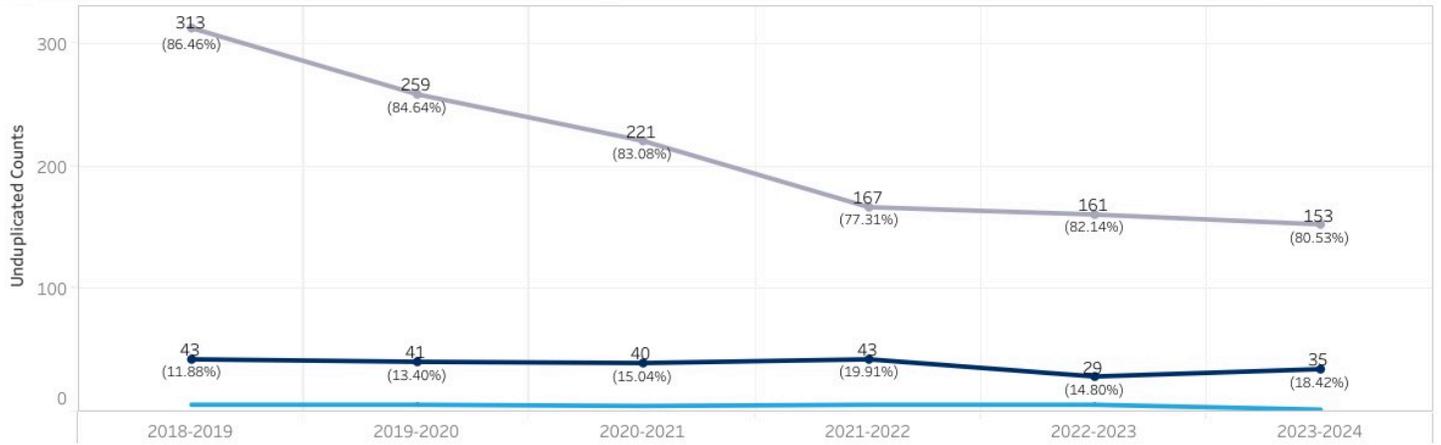
■ American Indian ..
 ■ Asian
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 0 102

Division	Department	Subject	Course	Select Student At..	2018-2019 Academic Year	2019-2020 Academic Year	2020-2021 Academic Year	2021-2022 Academic Year	2022-2023 Academic Year	2023-2024 Academic Year	
Grand Total					362 (100.0%)	306 (100.0%)	266 (100.0%)	216 (100.0%)	196 (100.0%)	190 (100.0%)	
Technology	ENGT	ENGT	ENGT 102	Asian				2 (15.4%)			
				Hispanic/Latino				9 (69.2%)			
				White				2 (15.4%)			
			ENGT 103	American Indian or ..			1 (2.0%)	1 (5.0%)			
				Asian	7 (9.7%)	5 (11.1%)	2 (4.0%)	4 (20.0%)	4 (9.3%)	3 (6.3%)	
				Black or African A..	3 (4.2%)		2 (4.0%)			1 (2.1%)	
				Hispanic/Latino	46 (63.9%)	33 (73.3%)	35 (70.0%)	14 (70.0%)	35 (81.4%)	39 (81.3%)	
				Native Hawaiian or ..			1 (2.0%)				
				Two or More Races			2 (4.0%)		1 (2.3%)		

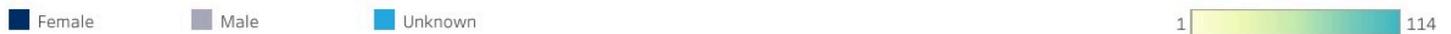
Figure 5. Students enrollment by race, 2018-2024.

To further promote diversity and expand participation among underrepresented groups, the ENGT program engages in outreach activities at local high school fairs and actively participates in National Manufacturing Day events hosted at Cerritos College. These recruitment efforts expose prospective students to career opportunities in engineering design technology and showcase the hands-on learning opportunities available through the ENGT program. Through these initiatives, the department creates awareness about careers in technical fields, reaching students early in their educational journeys and encouraging them to pursue high-demand, well-paying professions.

Unduplicated Headcounts



Population: All students

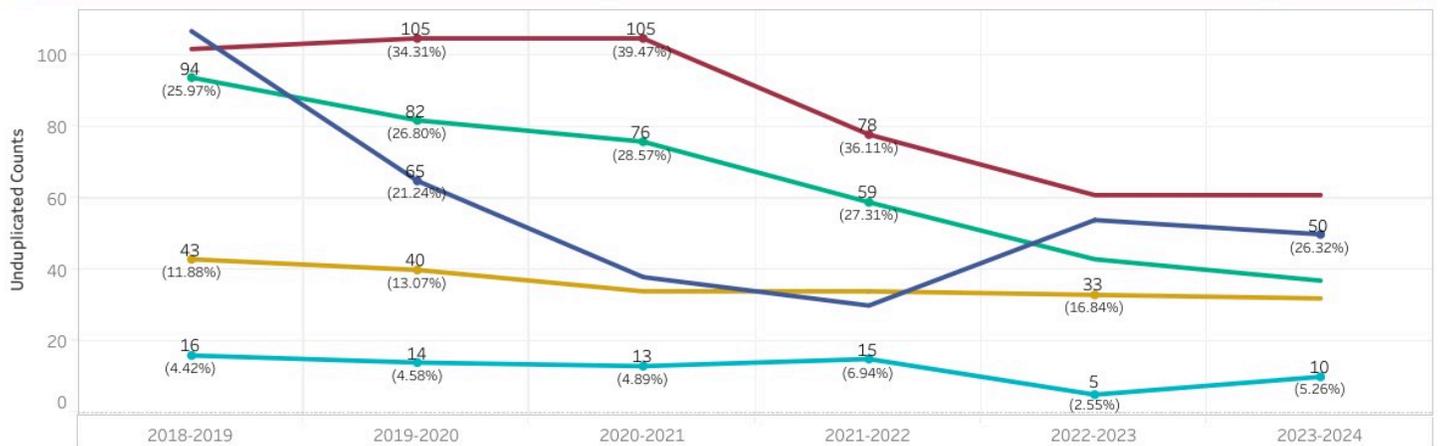


Division	Department	Subject	Course	Select Student At..	2018-2019 Academic Year	2019-2020 Academic Year	2020-2021 Academic Year	2021-2022 Academic Year	2022-2023 Academic Year	2023-2024 Academic Year
Grand Total					362 (100.00%)	306 (100.00%)	266 (100.00%)	216 (100.00%)	196 (100.00%)	190 (100.00%)
Technology	ENGT	ENGT	ENGT 102	Female				2 (15.38%)		
				Male				10 (76.92%)		
				Unknown				1 (7.69%)		

Figure 6, Students ENGT enrollment, disaggregated by gender, 2018-2024.

Gender distribution within the ENGT program follows national trends, with male students making up the majority of participants. Male enrollment ranges between 77% and 85%, a pattern that has remained consistent over time. Female participation, though lower, has shown some growth, with enrollment ranging from 12% to 17%. To close the gender gap and promote greater inclusion, the ASCC Engineering Technology Club plays a crucial role in engaging all students, including women and underrepresented groups. The club offers students opportunities to participate in engineering technology competitions such as SkillsUSA, WEX Robotics, and SAMPE, where they design and fabricate robots, composite structures, and drones. These experiences enhance technical skills, build confidence, and foster a sense of belonging, contributing to a more inclusive learning environment.

Unduplicated Headcounts



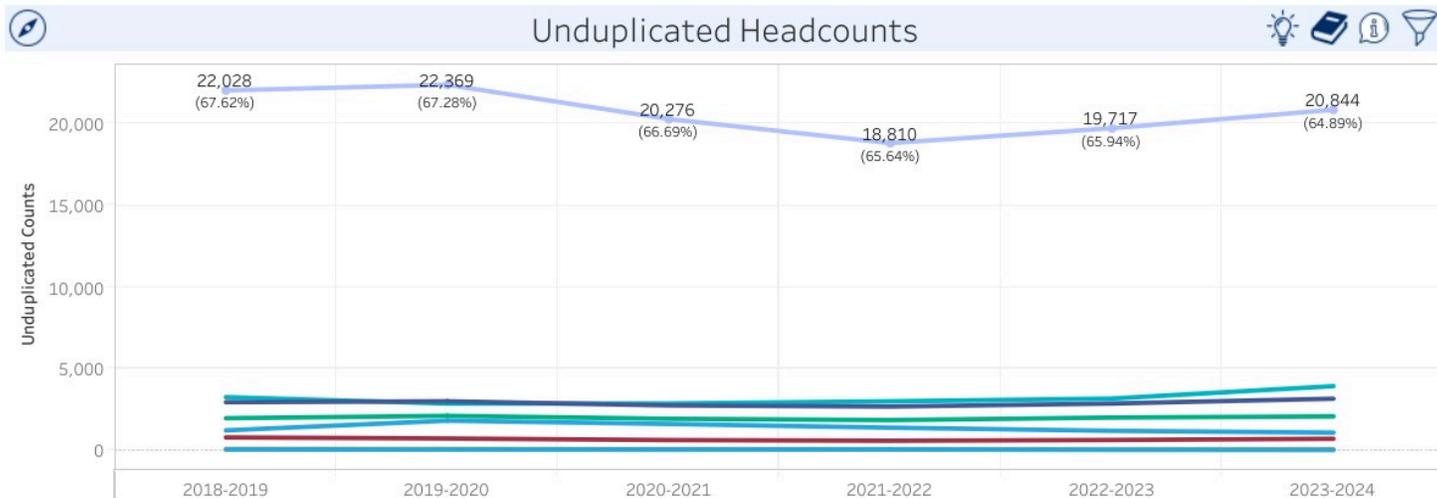
Population: All students



Division	Department	Subject	Course	Select Student At..	2018-2019 Academic Year	2019-2020 Academic Year	2020-2021 Academic Year	2021-2022 Academic Year	2022-2023 Academic Year	2023-2024 Academic Year
Grand Total					362 (100.0%)	306 (100.0%)	266 (100.0%)	216 (100.0%)	196 (100.0%)	190 (100.0%)
Technology	ENGT	ENGT	ENGT 102	20 - 24				3 (23.1%)		
				25 - 34				7 (53.8%)		
				50 and over				3		

Figure 7. Student enrollment by age group 2018-2024.

The age distribution of students in the ENGT program highlights its appeal to both traditional and non-traditional learners. Younger students, particularly those under the age of 18, are engaged through dual enrollment initiatives such as Project Lead The Way (PLTW). These partnerships with local high schools allow students to transfer credits to Cerritos College and, in some cases, transfer college credits back to their high schools to fulfill graduation requirements. This seamless pathway accelerates their academic progress, giving them an early start in exploring engineering concepts and preparing them for careers in technical fields. In addition to younger learners, the ENGT program serves a significant number of adult students aged 25 to 34 and 35 to 49. Many of these students are practicing engineers and technicians returning to Cerritos College to learn new skills essential for their careers. Courses like SolidWorks (ENGT259) and Composites Prepreg Manufacturing (ENGT152) offer advanced training that enables these professionals to remain competitive in their fields. Students aged 50 and older also participate in the program, often seeking specialized knowledge for career advancement or personal enrichment, though their numbers are smaller. The COVID-19 pandemic had a noticeable impact on enrollment, particularly among older students and underrepresented groups. However, the program has shown resilience, with post-pandemic recovery reflected in increased enrollment across various age groups. Many students have returned to face-to-face instruction, especially for courses requiring hands-on practice, while hybrid learning options continue to attract new students who benefit from the program's flexibility.



Population: All students

Legend: American Indian .. Asian Black or African A.. Hispanic/Latino Native Hawaiian .. White Tw: 0 4,776

Division	Department	Subject	Course	Select Student At..	2018-2019 Academic Year	2019-2020 Academic Year	2020-2021 Academic Year	2021-2022 Academic Year	2022-2023 Academic Year	2023-2024 Academic Year
Grand Total					32,574 (100.0%)	33,247 (100.0%)	30,405 (100.0%)	28,658 (100.0%)	29,900 (100.0%)	32,123 (100.0%)
Business Education	ACCT	ACCT	ACCT 51	Asian		6 (25.0%)			4 (18.2%)	
				Black or African A..				2 (9.1%)	2 (11.1%)	
				Hispanic/Latino		16 (66.7%)		11 (50.0%)	14 (77.8%)	

Figure 8. Entire Cerritos College enrollment by race 2018-2024.

When compared to the overall demographics of Cerritos College, the ENGT program is essentially the same. The program's high representation of Hispanic/Latino students aligns with the broader student population, but male enrollment remains disproportionately high. The program's ability to attract adult learners underscores its relevance to working professionals and mid-career individuals, many of whom balance education with employment and family commitments. The GoPass initiative is expected to enhance accessibility for African American students, aligning with the college's mission to promote diversity and equity. By eliminating transportation barriers, the initiative makes it easier for students from neighboring communities to pursue technical education, contributing to a more inclusive learning environment. The Engineering Design Technology program at Cerritos College serves a diverse and dynamic student body, from high school students gaining early exposure to technical concepts to seasoned professionals mastering new skills. Its alignment with industry demands ensures that students are well-prepared for the workforce, contributing to the economic development of the region. Through its involvement in the ASCC Engineering Technology Club, students gain practical experience in robotics, composite manufacturing, and drone design, further enhancing their education. As the program continues to grow, outreach efforts through high school fairs and National Manufacturing Day events will play a vital role in expanding access and fostering inclusivity. The ENGT program exemplifies Cerritos College's commitment to providing meaningful educational pathways and lifelong opportunities for all students.

2. Headcount (unduplicated) and enrollment (duplicated) in the program. Consider the following questions when writing your response:

- Identify enrollment trends.
- Have there been an increase or decrease in enrollment in the last year?
- Are there differences in trends when you disaggregate the data (e.g., online versus face-to-face, demographics, special populations, etc.)?
- How will enrollment trends affect staffing decisions?

The Engineering Design Technology (ENGT) program at Cerritos College has experienced notable fluctuations in awards over recent years and decrease of enrollment. A critical factor influencing these trends is the introduction and promotion of the theoretical Engineering Transfer (ENGR) program a disastrous decision supported and championed by Rick Miranda, an initiative which robbed the ENGT department (including ENGT, ET, NPD programs) of its enrollments and future students and put students in the perpetual cycle of taking advanced math, with typical students needing to spend 4-8 years at Cerritos before transferring somewhere else for additional two years and without any meaningful employment outcome at the AA level. The ENGT Department, its faculties and ultimately students are a direct victim of Rick Miranda's decision to create competing ENGR112 (direct duplication and competing with ENGT138 which was both UCI and Cal State transferable) and ENGR110 (directly competing with ET101) classes under the physics department/ENGR. Prior to introduction of the ENGR112 in 2014 all students interesting to pursue career in engineering were taking the ENGT138 and ET101 classes, which are transferable, and most students were exposed to the opportunities of ET and ENGT AA and Certification, and many have taken dual pathways wherein they completed both the ENGT degrees/certificates and general coursework needed for transfer to any local Cal State engineering programs. This all changes with duplication of resources and introduction of meaningless CAD class under physics department (ENGR112), and similar meaningless Introduction to engineering class (ENGR112). Since then, the counselors are directing practically all students interested in engineering or technology only to the ENGR program. The enrollment and award data, when analyzed together, show that while total enrollments across ENGT, Engineering Technology (ET), New products Development (NPD) and plastics, what we call ENGT Department, and ENGR have remained stable, the growth in ENGR has been largely at the expense of the technical programs, mainly ENGT/ET. The stacked data of unduplicated enrollment counts, and source data presented on figures 9 and 10, clearly demonstrates above statements. . .

Enrollment Counts

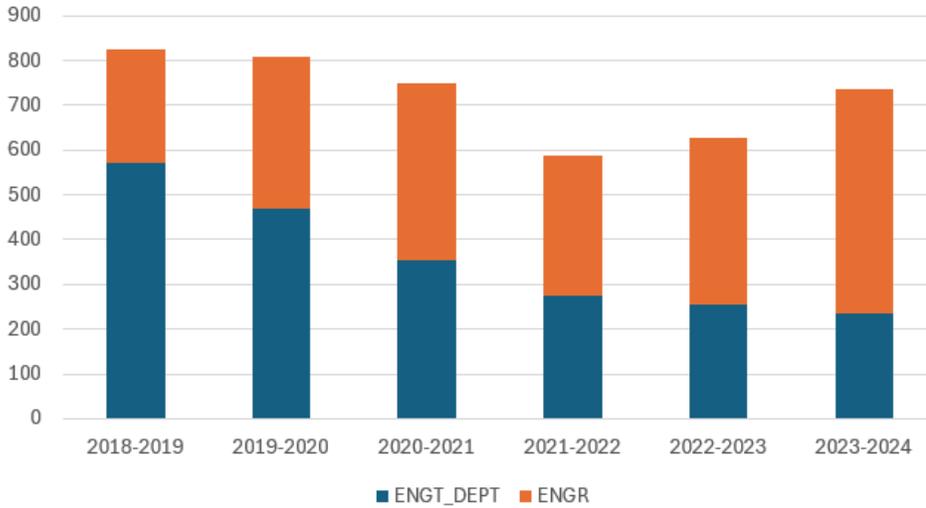


Figure 9, ENGT_Dept unduplicated enrollment, stacked with ENGR, shows stability, demonstrating that the ENGR growth was on victimization and expense of the ENGT enrollment, corrected for the IERP data for 2018-2024.

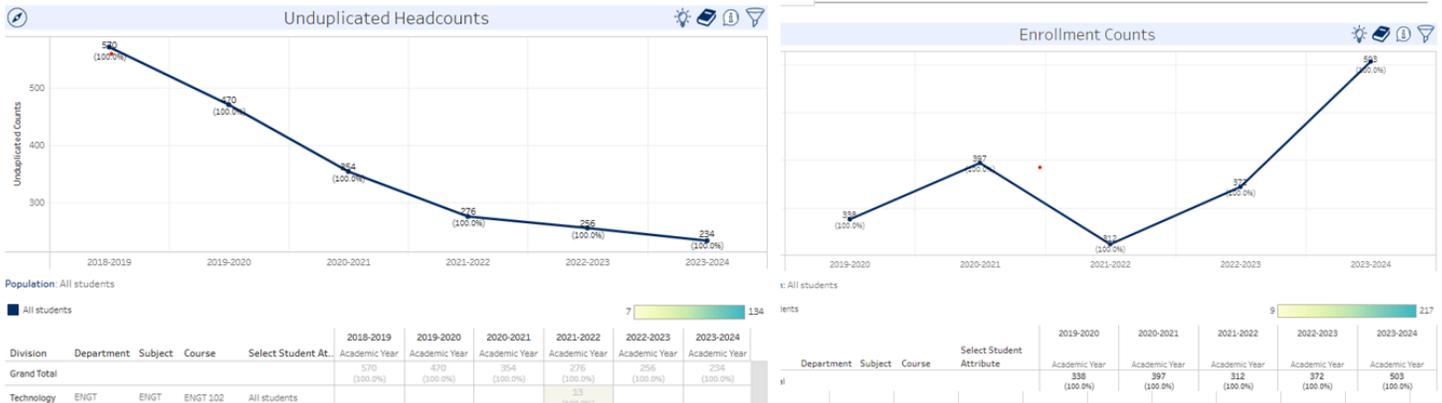
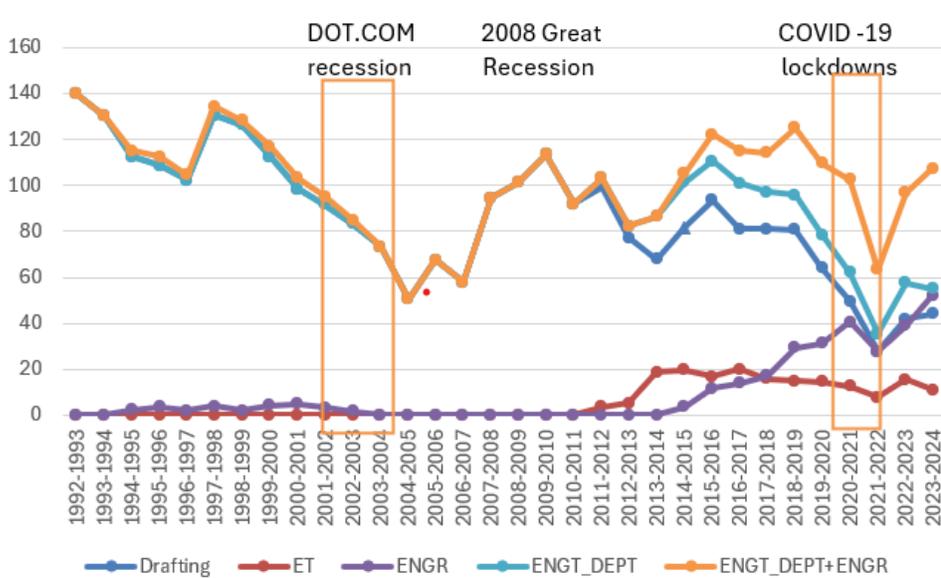


Figure 10 Enrollment count source data for the ENGT_DEPT (ENGT+ET+NPD+PMT) and for the ENGR (PHYS, CLASSES ENGR).

In figure 11, we present long term longitudinal graph of the FTES for the engineering department and the ENGR department, and in figure 12 scatter plots of the ENGT_DEPT vs ENGR FTES values. Data shows that the decline in the ENGR enrollment is internal push/ promotion of the ENGR pathways, and that both programs draws from the same students populations.

Longitudinal FTES 1992-2024



FTES 2010-2024

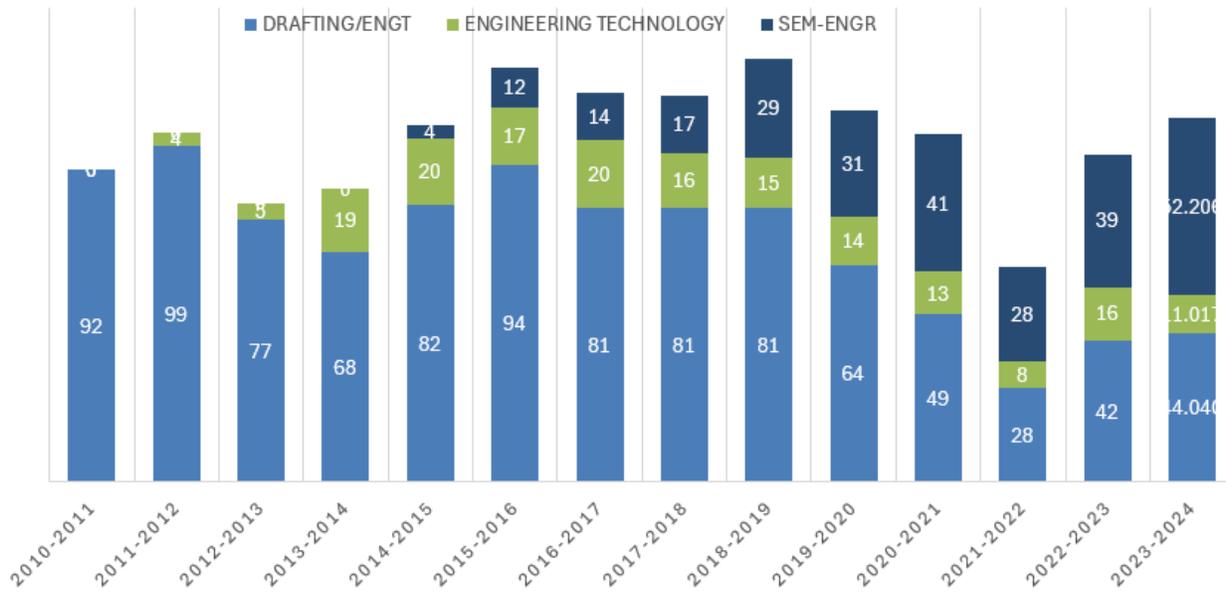


Figure 11. Long term FTES trends, ENGT_DEPT vs ENGR. , line graph (11a) and detailed stacked graph (11b)

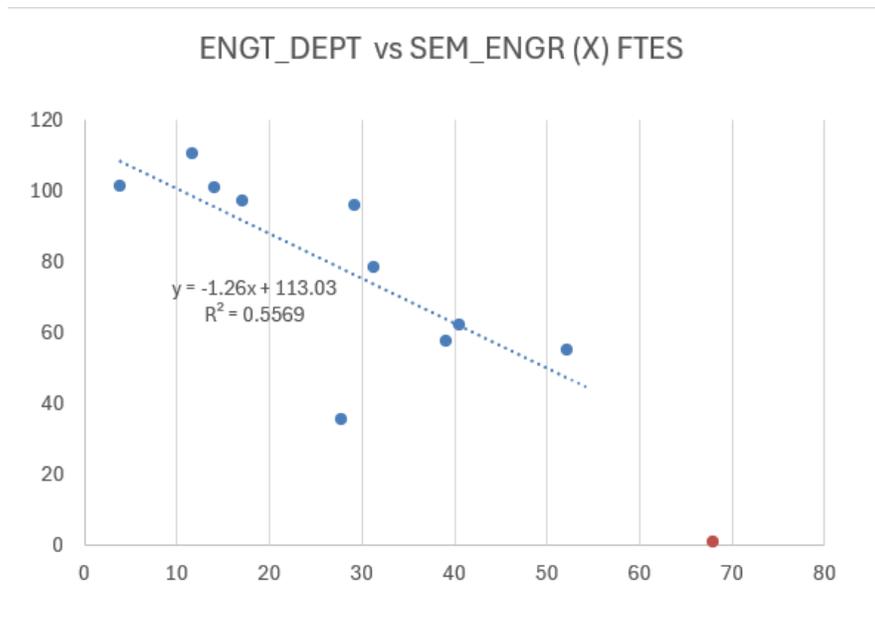


Figure 12. Correlations between ENGT_DEPT and ENGR .

Awards in ENGT programs peaked in the years leading up to 2018-2019, coinciding with strong industry demand for technical skills. However, since then, the number of awards has fluctuated, with a noticeable decline during the pandemic. This decline corresponds with an increase in ENGR enrollment and awards, suggesting a shift in institutional focus. ENGT awards rose again slightly in 2022-2023, demonstrating the resilience of technical programs as students returned to face-to-face learning.

Total Awards

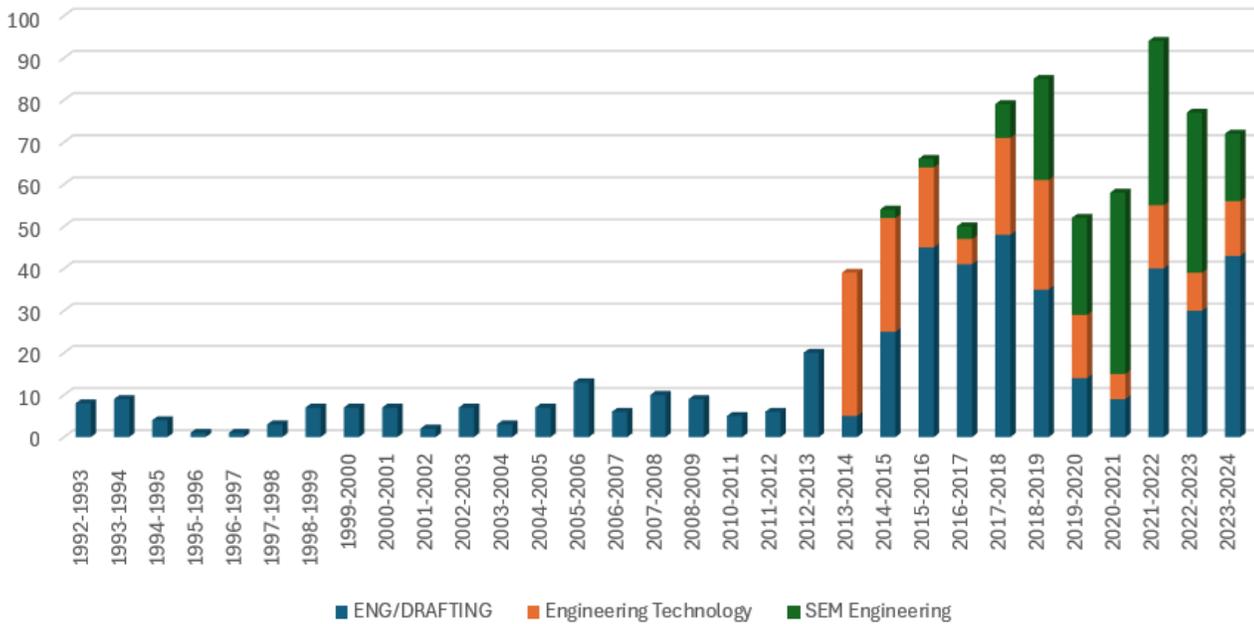


Figure 13: Total Awards Counts Disseggregated ENGT Department and ENGR

Demographically, ENGT continues to attract a large proportion of Hispanic/Latino students, reflecting the population of the region. African American participation, while historically low, is expected to increase due to the GoPass initiative, which offers free transportation to students from neighboring communities such as Compton and Santa Fe Springs. This initiative will reduce barriers to education and provide underrepresented students with greater access to technical training programs, aligning with Cerritos College's mission of equity and inclusion.

In contrast to ENGT and ET, the ENGR program focuses on preparing students for transfer to four-year universities, a pathway that involves completing a demanding sequence of math prerequisites often leading students to up to 8 years of plans to finish two years transfer only degree. This pathway can delay workforce entry by up to six years, a timeline that disproportionately impacts students from underrepresented backgrounds. For many African American and Hispanic/Latino students, steering them into the ENGR program prolongs economic instability, as they are deprived of immediate employment opportunities available through ENGT certificates and associate degrees.

The reallocation of resources from ENGT to ENGR raises concerns about the college's priorities. Counselors play a key role in guiding students toward programs that align with their goals. However, by promoting ENGR over ENGT, counselors may inadvertently hinder students' ability to secure employment. A more balanced counseling approach would involve recommending that students interested in pursuing a bachelor's degree in engineering also complete ENGT certificates, such as SolidWorks or composites manufacturing, to enhance their employability. This dual approach ensures that students gain practical skills while working toward long-term academic goals. The trends in awards reflect these shifts in institutional focus. While ENGT and ET awards fluctuated, ENGR awards steadily increased, demonstrating the college's strategic push toward transfer education. Staffing decisions will need to reflect these trends, ensuring that technical programs receive adequate faculty and resources to meet student demand. As face-to-face learning resumes, the demand for skilled instructors in hands-on courses will increase, necessitating careful planning and resource allocation.

The Engineering Design Technology Department affirms its ongoing commitment to collaborate closely with the Counseling Division to ensure academic counselors understand and can clearly articulate the distinct pathways, learning outcomes, and career trajectories associated with the ENGT programs versus traditional engineering transfer (ENGR) tracks; at the same time, the department will partner with the Science, Engineering, and Mathematics (SEM) Division to co promote both sets of offerings, so that SEM students are fully informed of the advantages that engineering technology courses, industry-recognized certifications, and the integrated SolidWorks credential ladder, and composites manufacturing engineering training provide for immediate workforce entry or advanced applied studies. Furthermore ENGT department is pursuing full University of California transfer status for all of its classes to benefit transfer minded students.

The Engineering Design Technology (ENGT) faculty, in collaboration with the Technology Division, will work closely with the SEM and Counseling Divisions to address the issue of equitable representation between ENGT and ENGR pathways. This coordinated effort aims to ensure that students receive clear, accurate guidance when selecting between practical, workforce-oriented programs like ENGT and more theoretical, transfer-oriented options like ENGR. As part of this initiative, the departments will also seek to resolve the ongoing concern surrounding the duplication of ENGR112. One potential and constructive solution is to have ENGT faculty continue teaching ENGR112, ensuring continuity and expertise in course delivery. Alternatively, the ENGR112 course could be retired altogether and replaced with ENGT course offerings, as was the case prior to 2015. This would streamline the curriculum, eliminate confusion, and reaffirm the distinct but complementary roles of each program in preparing students for successful careers or further education in engineering and technology. Moving forward, both programs are committed to providing every ENGR student with exposure to ENGT opportunities and every ENGT student with access to ENGR pathways, fostering a more integrated and informed educational experience for all.

In summary, the ENGT program provides a direct pathway to employment, with many students securing jobs after completing just one course. The artificial growth of the ENGR program, however, diverts students from these opportunities, prolonging their time to workforce entry and economic stability. To support both academic and career goals, the college must adopt a holistic approach to counseling, encouraging students to pursue technical certificates alongside transfer degrees. With strategic staffing and resource allocation, Cerritos College can ensure that both ENGT and ENGR programs thrive, providing students with meaningful educational pathways that align with their diverse needs and aspirations.

3. Discuss the program's success and retention rates, addressing any performance gaps if success rates are lower for disproportionately impacted students. Consider the following questions when writing your response:

- How have the success and retention rates changed over time?
- Are there particular courses that have particularly low rates and may prove a barrier to program completion?

UNIT PLANNING AND PROGRAM REVIEW



Population: All students

Figure 14. Overall Success Rate of ENGT classes.

A holistic reading of the longitudinal completion dataset shows that our students' journey traces the same pandemic that community college career programs all over California experienced: average success floated serenely at roughly eighty five percent in 2018 and 2019, plunged to barely seventy six percent in the fully remote 2020/2021 year when interactive classroom with professional workstations and 3d printers were replaced with the in home wi-fi and subpar laptops, then climbed back each year as doors reopened, scene shifted hybrid models took hold, and faculty recentered hands-on practice, landing at just over eighty two percent in 2023-2024; this rebound mirrors statewide CTE award trends that nosedived with the switch to emergency online learning and have been clawing their way up since in-person instruction resumed.

Within that broad rhythm the data tell sharper stories: theory-light, software-intensive courses such as ENGT 137 and the ENGT 117 G&DT consistently posted mid ninety percent success, testifying to the power of tightly scaffolded online content and industry aligned certification goals, while collaborative, concept heavy offerings like ENGT 102 and the ENGT 259 fell into the high sixties to low seventies, a disparity that underscores how first semester learners and project classes were hit hardest by COVID-19 pandemic closure and subsequent asynchronous screen mediated instruction and by the emotional weight of the pandemic. Equity gaps narrowed as on campus access returned, yet the numbers still whisper that retention remains most fragile where students must master abstract visualization without immediate peer support, so the program's new wrap around inverted classroom with individual project based tutoring, culturally responsive pedagogy, and coming soon AI driven personalized feedback—anchored in the ten freshly minted courses, three fully revised legacy classes, and especially the trailblazing ENT 105 Artificial Intelligence for Engineering Technology and ENGT 100L and 200L labs and certification preparation sequences are not just planned curricular upgrades but justice oriented interventions designed to keep every learner, from first gen students to returning veterans, on a path to completion.

The Engineering Design Technology (ENGT) program at Cerritos College has experienced notable fluctuations in enrollment and awards over recent years. A critical factor influencing these trends is the introduction and promotion of the theoretical Engineering Transfer (ENGR) program. The enrollment and award data, when analyzed together, show that while total enrollments across ENGT, Engineering Technology (ET), and ENGR have remained stable, the growth in ENGR has been largely at the expense of the technical programs like ENGT and ET. Completion data for the ENGT and ET programs reflect the impact of this internal reallocation. Awards in these programs peaked in the years leading up to 2018-2019, coinciding with strong industry demand for technical skills. However, since then, the number of awards has fluctuated, with a noticeable decline during the pandemic. This decline corresponds with an increase in ENGR enrollment and awards, suggesting a shift in institutional focus. ENGT awards rose again slightly in 2022-2023, demonstrating the resilience of technical programs as students returned to face-to-face learning. Demographically, ENGT continues to attract a large proportion of Hispanic/Latino students, reflecting the population of the region. African American participation, while historically low, is expected to increase due to the GoPass initiative, which offers free transportation to students from neighboring communities such as Compton and Santa Fe Springs. This initiative will reduce barriers to education and provide underrepresented students with greater access to technical training programs, aligning with Cerritos College's mission of equity and inclusion.

*The optimal approach will be to encourage students to journey towards their goals in a series of concentric circles, first by completing the ENGT/ET certificates then expanding next circle with generals and gain AA in ENGT and then complete additional advanced math, physics and ENGR generals including all of the for those interested for transfer and getting their AA and or AA-T in engineering or other field. The revised ENGT department web site will have advices on this approach with success alumni stories.

The Engineering Design Technology Department affirms its ongoing commitment to collaborate closely with the Counseling Division to ensure academic counselors understand and can clearly articulate the distinct pathways, learning outcomes, and career trajectories associated with the ENGT programs versus traditional engineering transfer (ENGR) tracks; at the same time, the department will partner with the Science, Engineering, and Mathematics (SEM) Division to promote both sets of offerings, so that SEM students are fully informed of the advantages that engineering technology courses, industry recognized certifications, and the integrated SolidWorks credential ladder provide for immediate workforce entry or advanced applied studies.

Finally, we are currently working with UC systems and our curriculum committee on expanding transferability of most of the ENGT courses into UC, with direct course transfer of certain courses to UCI courses, which will furthermore improve students upward mobility.

4. With regards to success and retention rates, what is the program doing or planning to do to close performance gaps and address student equity? Consider the following question when writing your response:

- **Are there differences in success rates across delivery method (e.g., face-to-face compared to online)?**

The success rates within the Engineering Design Technology (ENGT) program at Cerritos College exhibit significant variations when analyzed by delivery method, ethnicity, and age group, revealing key insights into student performance and equity challenges.

The COVID-19 pandemic forced the ENGT program to adapt by offering more online and hybrid courses. While these remote options provided continuity, they also presented challenges, particularly for hands-on, skill-based courses. The data reveals a clear difference in success rates across delivery methods. Face-to-face instruction consistently results in higher success rates, averaging above 80%, compared to online courses, which show lower performance, particularly during the height of the pandemic. For example, between 2020-2021, the success rate for overall online courses dropped to 77.27% and for heavy hands on oriented courses even to high sixties percentile, while traditional, in-person courses achieved success rates closer to 85%. These trends highlight the importance of in-person learning for technical fields where practical skills, immediate feedback, and hands-on experience are critical to student success. The program is now focused on realigning towards on-campus instruction, recognizing the limitations of remote delivery for courses involving CAD modeling, composites manufacturing, and other practical skills. Moving forward, the program will retain some hybrid options for students balancing work and education but will emphasize face-to-face learning to enhance engagement and outcomes.

Analyzing success rates across ethnic groups reveals additional insights into student performance and potential equity gaps. Hispanic/Latino students, who make up the majority of the

ENGT program's population, demonstrate steady success rates between 80% and 85% across recent academic years. African American students, although a smaller group, show varied success rates, often influenced by the availability of resources and external challenges. The variety of College-wide initiative aims to improve access and outcomes for African American students. Asian students generally exhibit higher success rates, often surpassing 90%, reflecting strong academic engagement. The program serves a diverse range of age groups, from dual-enrolled high school students to mid-career professionals seeking new skills. Success rates vary across these age groups. Younger students under 19 years tend to have success rates ranging from 67% to 85%, often reflecting their adjustment to college-level expectations. Students aged 20 to 34, who form the core of the program, exhibit the most consistent performance, with success rates often exceeding 80%. Older students aged 35 to 49 and those 50 and above show fluctuating success, often depending on their ability to balance education with other responsibilities. The program has identified the need for tailored support for these students, ensuring they remain engaged despite competing demands.

The data also indicates that dual-enrolled high school students, participating through the Project Lead The Way (PLTW) initiative, tend to perform well, particularly in introductory courses. (ENGT103, ET101, ET102, ENGT104) These students benefit from seamless articulation agreements between high schools and Cerritos College, allowing them to gain college credits while still in high school. Professionals enrolling in courses like SolidWorks (ENGT259) and Composites Manufacturing (PMT51/ now ENGT251) also exhibit high success rates, often achieving immediate employment after course completion, reinforcing the relevance of the program to industry needs.

In conclusion, the analysis of success rates within the ENGT program highlights the importance of face-to-face learning, especially for hands-on technical education. While online and hybrid options provide flexibility, they cannot fully replace the benefits of in-person instruction for developing practical skills. The program's focus on realigning towards on-campus delivery is essential to improving student outcomes. Addressing equity gaps across ethnic and age groups will also be critical. Initiatives like GoPass and tailored support for ethnic groups and for the dual enrolled students will help bridge these gaps and ensure equitable access to education. By combining strategic instructional planning with targeted outreach and support, the ENGT program is well-positioned to meet the diverse needs of its student population and align with workforce demands.

5. Discuss conclusions drawn from the program data, assessments (SLOs), and/or other data. Indicate any specific responses or programmatic changes based on the data.

The analysis of data from the Engineering Design Technology (ENGT) program at Cerritos College reveals key trends and areas of opportunity for improving student outcomes and aligning the program more closely with industry needs. The data demonstrates that face-to-face instruction consistently outperforms online formats, particularly in skill-intensive courses like SolidWorks, CAD drafting, and composites manufacturing. Additionally, success rates vary across age groups and ethnicities, reflecting the diverse needs of the student population. Moving forward, the program will use these insights to implement programmatic changes and strategic improvements designed to increase accessibility, foster equity, and enhance student engagement.

One of the primary conclusions drawn from the data is the importance of maintaining a strong emphasis on in-person learning. While online and hybrid options provided flexibility during the COVID-19 pandemic, they do not fully meet the educational needs of students in technical fields. Hands-on learning, real-time collaboration, and direct feedback are essential for mastering tools and techniques relevant to engineering design and manufacturing. Realigning the program toward on-campus instruction is a key priority, ensuring that students gain the practical experience required for immediate employment in industries such as aerospace and automotive manufacturing.

The data also highlights equity gaps in success rates, particularly among African American students. However, additional support is needed to ensure that all students, especially those from underrepresented backgrounds, can thrive in the program. Tailored advising, mentorship programs, and early exposure to technical fields through dual enrollment opportunities will be essential components of this strategy.

Looking ahead, the ENGT program is exploring several innovative improvements designed to enhance student success and expand pathways to industry-relevant credentials. One key initiative involves developing scalable and foldable certificates and degrees, enabling students to build upon their credentials seamlessly. For example, students could earn a foundational certificate in CAD design (Mechanical Engineering Design Technicain) and advance to a more specialized certificate in Engineering Design Technology Or Composites/ Plastics manufacturing or New Products Development by completing just four to eight additional units for each of the new certificate. The AA in any of the above field is achieved by completing in addition to the major requirement, of all of the general requirements, as defined by College Catalogue. This modular approach will provide clear, achievable steps toward advanced certifications, keeping students motivated and on track for career advancement.

Another planned improvement is the introduction of a new courses (with reuse of the old class numbers i.e. "containers" so that previously enrolled students still can graduate faster) focused on practical engineering design technology, aligned with student competitions such as VEX Robotics. This course will run in parallel with activities organized by the ASCC Engineering Technology Club, providing students with opportunities to design, build, and compete in robotics events. This proposed activity is going to be direct mentorship, and will close equity gap for different group of students. By integrating classroom learning with extracurricular projects, this initiative will foster a deeper understanding of engineering design technology concepts while promoting teamwork and creativity. The course will also serve as a pipeline for students interested in pursuing careers in robotics and automation, fields that are increasingly in demand.

The program also recognizes the need to offer a class dedicated to preparing students for industry-standard certifications. These certifications, such as CSWA, CSWP, CSWP-Advanced Specialties, CSWE, and certifications for Autodesk Fusion 360 and Inventor (ACU and ACP), are highly valued by employers and can significantly enhance students' job prospects. A focused course on certification preparation will provide students with targeted training, practice exams, and expert guidance, helping them earn these credentials efficiently. This course will ensure that students are not only academically prepared but also industry-ready, increasing their competitiveness in the job market.

As part of its long-term vision, the ENGT program is exploring the development of a Bachelor's degree in Drafting, aimed at meeting the growing demand for advanced technical expertise. This degree could be designed with an attractive title, such as BS in Computer-Aided Mechanical Engineering Design or BS in Maker Technologies, to appeal to a wide range of students and align with emerging trends in engineering and manufacturing. The bachelor's program would provide students with a more comprehensive education, combining advanced technical skills with business and project management competencies, preparing graduates for leadership roles in their fields.

A significant area of program growth involves the ENGT program's involvement in the new biotechnology/biomanufacturing and chemical engineering technician programs at Cerritos College. ET 103 and ENGT111 courses play an essential role in these interdisciplinary fields, training students in computer-manufacturing process control, and for chemistry technicians in the plastics technologies. . By equipping biotechnology and chemical engineering technology students with engineering technology skills, the program ensures they gain competencies essential for today's evolving industries, where engineering and science increasingly intersect. This collaboration positions Cerritos College as a leader in producing a workforce ready for the demands of both manufacturing and bioscience industries.

In conclusion, the data-driven insights gathered from the ENGT program provide a clear roadmap for future improvements. The program's focus on face-to-face learning, equitable access, and industry alignment will ensure that students receive the education they need to succeed in today's competitive job market. By developing scalable certificates, offering practical engineering courses, preparing students for industry certifications, and exploring the potential for a Bachelor's degree, the ENGT program at Cerritos College will continue to evolve to meet the needs of its students and the industries it serves. These initiatives will enhance the program's reputation as a leader in career and technical education, empowering students to achieve both immediate employment and long-term career success.

B. Career Technical Education (CTE) Supplemental Questions : Version by Micic, Miodrag on 04/22/2025 02:18

1. How strong is the labor market demand for the program? Utilizing labor market data, describe changes in demand over the last six years and discuss the occupational outlook for the next six years.

The labor market demand for graduates of the Engineering Design Technology (ENGT) program at Cerritos College has remained robust over the past six years. Data from LightCast reveals significant trends across industries that rely on technical skills in engineering design, manufacturing, and product development. Regional employers such as Northrop Grumman, SpaceX, and Boeing consistently seek ENGT graduates, highlighting the alignment of the program with workforce needs. The versatility of the ENGT curriculum, with its focus on CAD design, SolidWorks, and concurrent manufacturing, ensures that graduates are well-prepared for high-demand roles.

Over the last six years, labor market trends show mixed but largely positive outcomes for technical fields. According to LightCast Market Report, demand for drafters in architecture and civil engineering has increased for about 9.9%, driven by infrastructure projects and urban development. However, demand for mechanical drafters has slightly declined, reflecting shifts toward automation and digital modeling in advanced manufacturing. Despite these shifts, the regional market in Los Angeles and Orange Counties has sustained a need for technicians with

specialized skills, especially in aerospace, advanced manufacturing, and biomanufacturing sectors. New collaborations with biotechnology and chemical engineering programs have expanded the program's reach, preparing students for roles that blend technical engineering skills with scientific processes. Looking ahead, the occupational outlook for the next six years remains promising with highest anticipated increases of 24.1% for the SolidWorks based skills in drafting/design. The transition to automated manufacturing and increased investment in infrastructure will fuel demand for skilled workers in engineering technology. Advanced manufacturing, aerospace, and product development industries will continue to require expertise in CAD systems and design for manufacturing operations, ensuring that ENGT graduates remain competitive. The emergence of biomanufacturing as a growing field further expands career prospects, giving graduates the flexibility to explore roles across multiple sectors. Employers are expected to prioritize candidates with certifications in SolidWorks, Autodesk Inventor, and design for manufacturing and composites parts productions, areas in which ENGT graduates excel. The program's connections with industry play a vital role in maintaining high employment rates for its graduates. ENGT instructors have built strong networks with local employers, regularly updating the curriculum to reflect industry trends and ensuring that students develop practical, relevant skills. These connections are instrumental in facilitating internships, apprenticeships, and full-time positions, with many students receiving job offers before completing their certificates or degrees. This seamless transition from classroom to career exemplifies the program's commitment to producing job-ready graduates.

Perkins V Core 4 data standing at 96, underscores the program's success in placing students into the workforce. The ENGT program at Cerritos College boasts one of the highest Core 4 employment indicators (96), matching the automotive technology program and surpassing all other fields. This indicator reflects the percentage of graduates who secure employment soon after completing their education, emphasizing the effectiveness of the ENGT program in aligning with labor market needs. Achieving such a high Core 4 score is a testament to the quality of the program's instruction, the relevance of its curriculum, and the strength of its industry partnerships.

In conclusion, the labor market demand for ENGT graduates remains strong, supported by evolving industry needs and a well-designed curriculum. LightCast data confirms that job opportunities have remained stable or increased in key sectors, with future projections indicating sustained demand for technical skills. The program's integration with biotechnology and chemical engineering further enhances its relevance in the region. The exceptionally high Perkins V Core 4 indicator highlights the program's ability to produce graduates who are highly employable, with many securing well-paying jobs even before graduation. This success reflects the program's ongoing commitment to preparing students for meaningful careers and ensuring that they achieve long-term economic stability and living wages. Graduating with the ENGT certificate or AA is one of the fastest way for someone to raise out of the poverty level to the living wage middle class standard.

2. How does the program address needs that are not met by similar programs in the college's region/service area? Identify and describe any distinctive component of the program and/or unique contributions.

The Engineering Design Technology (ENGT) program at Cerritos College stands out as a premier educational pathway in Southern California, offering students a comprehensive, industry-aligned curriculum that addresses workforce needs unmet by other programs in the Los Angeles and Orange County regions. Its innovative approach integrates real-world practices with certifications, advanced faculty expertise, and hands-on manufacturing skills, ensuring that students graduate with the competencies required for immediate employment. A defining feature of the ENGT program is the inclusion of "forever living final exams." Every course culminates in a standard industry certification exam, providing students with credentials such as Certified SolidWorks Associate (CSWA), Certified SolidWorks Professional (CSWP), CSWP-Advanced Specialties, Certified Autodesk User (CAU), and Certified Autodesk Professional (CAP). These certifications offer immediate validation of students' skills to employers, making Cerritos graduates highly competitive in the job market. No other community college in the Los Angeles-Orange County region offers this level of certification integration, giving the ENGT program a distinct advantage.

The faculty of the ENGT program are industry leaders with extensive academic and professional qualifications, bringing unmatched expertise to the classroom. Professor Dr. Miodrag Micic, the department chair, holds both a Sc.D. and Ph.D., in addition to certifications as a Certified SolidWorks Expert (CSWE) and an Accredited SolidWorks Educator. His deep expertise spans materials science, product design, and engineering education and he held in a past a C-level positions at the major international corporations such as being the Vice President for R&D and later Chief Marketing Officer at MP Biomedicals LLC, Chief Marketing officer at Gojira Fine Chemicals Inc, and prior to those Senior Application Scientist and Product Manager at Veeco Instrument Inc. Dr. Micic's academic background is complemented by strong industry connections, ensuring that the ENGT program remains aligned with current trends and workforce needs.

Mr. David Li, M.S., an expert in plastics injection molding and tooling design and process simulations, and he brings global experience from China, Singapore, and the United States to the program. His multiple certifications as a Certified SolidWorks Professional (CSWP) and Certified SolidWorks Professionals -Advanced Specialties and Accredited SolidWorks Educator further enhance the program's focus on practical skills. Mr. Li's connections with international manufacturing firms provide unique career opportunities for students and expose them to cutting-edge practices in the field of plastics engineering.

Mr. Fergus O'Farrell, a full time senior engineer of composites and tooling at Northrop Grumman Corporation is a part-time instructor with extensive experience in composites manufacturing. Mr. O'Farrell played a key role in developing manufacturing processes for the F-18 and F-35 fighter jets at Northrop Grumman's El Segundo facility. His deep knowledge of aerospace manufacturing gives students rare insights into high-precision production environments and connects them directly to the aerospace industry.

The program also benefits from the contributions of Alan Jamka, M.S., a full-time high school teacher at Downey High School and an adjunct faculty member at Cerritos College. Mr. Jamka's involvement bridges the gap between high school and college education. He plays an essential role in the Project Lead The Way (PLTW) initiative, which allows dual-enrolled high school students to earn Cerritos College credits and transfer them back to their high schools as PLTW credits. This integration creates seamless pathways for high school students to explore technical careers while earning college credit, accelerating their educational progress.

Dr. Micic, Mr. Li, and Mr. Jamka are all fully certified PLTW instructors, a distinction that enables them to certify their courses as PLTW-compliant. This certification is particularly valuable for attracting dual-enrolled high school students and promoting early engagement with technical education. The program's emphasis on PLTW-aligned courses ensures that students receive rigorous, standards-based instruction that aligns with both high school and college curricula, making the transition between educational levels smooth and effective.

The ENGT program's unique focus on concurrent design for manufacturing sets it apart from other regional programs. Students not only learn to create CAD models but also prototype their designs using a variety of manufacturing techniques, including thermoforming, injection molding, rotomolding, and fiberglass manufacturing. Through the ENGT-PT certificate in Engineering Design and Production Technology, students gain expertise in designing products for mass manufacturing, including woodworking, machining, welding, casting, and composites production. Many students further enhance their knowledge by enrolling in additional courses in automotive technology, machine tools, welding, or woodworking, becoming specialists in designing for specific manufacturing methods.

The faculty's industry connections and expertise facilitate career placement, ensuring that practically every ENGT student secures employment before graduation. The close collaboration between faculty and local employers opens doors to internships, apprenticeships, and full-time positions, giving students invaluable hands-on experience. The program's ability to integrate education with industry needs exemplifies the strength of its approach, making graduates immediately employable in high-demand fields.

The ENGT program's employment outcomes are reflected in its exceptionally high Perkins V Core 4 employment indicator, which measures the percentage of graduates who secure jobs shortly after completing their studies. The ENGT program shares the highest Core 4 score with the automotive technology program, surpassing all other fields at the college. This indicator highlights the effectiveness of the program in preparing students for the workforce and demonstrates that ENGT graduates achieve living-wage employment at rates higher than most other programs.

In summary, the ENGT program at Cerritos College offers a combination of certification-focused instruction, advanced faculty expertise, and strong industry connections that is unmatched in the region. The integration of PLTW courses attracts dual-enrolled high school students, providing them with a head start in technical education. The program's emphasis on hands-on learning, industry certifications, and concurrent design for manufacturing ensures that graduates are equipped with the skills needed to excel in today's job market. With exceptional faculty, cutting-edge curriculum, and direct pathways to employment, the ENGT program continues to set the standard for engineering design education in Southern California..

3. What is the success, completion, and employment rates for students in the program? Identify the standards set by the program for each metric and discuss any factors that may impact the metrics for students in the program. Based on the program's benchmarks, describe the status of any action plans for maintaining/improving the metrics.

Based on the Perkins V Core Indicators and the IERP data, the ENGT program at Cerritos College demonstrates high success, completion, and employment rates, highlighting its effectiveness as a career and technical education program. The performance indicators for employment—particularly Perkins Core 4—underscore the program's strength, with some metrics surpassing district and state averages, making ENGT a reliable pathway to living-wage employment for its graduates. The success and completion rates within the ENGT program are closely aligned with workforce needs. According to the Perkins V reports, completion rates are strong across most demographic groups, especially for male and Hispanic students, who constitute the majority of the program's enrollment. The program shows particularly high employment rates, with many students obtaining industry-related jobs before or shortly after graduation. In specific years, the program achieved employment rates exceeding 90 percent, a result that places ENGT among the highest-performing technical programs at Cerritos College.

For instance, the employment rates for ENGT students in the most recent reporting year were recorded at 92.31 percent, surpassing the negotiated benchmark and significantly higher than other fields of study. This high employment metric reflects both the relevance of the curriculum and the quality of the faculty, who maintain close relationships with industry leaders. Every ENGT course culminates in an industry-standard certification exam, such as Certified SolidWorks Associate (CSWA) or Autodesk Certified User (ACU), further enhancing employability by equipping students with validated, recognized skills.

Factors Impacting Success Metrics

Several factors contribute to the program's success in meeting its goals. First, the integration of hands-on learning and certifications ensures that students acquire both theoretical knowledge and practical skills. This dual approach prepares students for immediate entry into the workforce, with many securing jobs even before completing their degrees or certificates. Additionally, the program's alignment with regional industries—such as aerospace, plastics manufacturing, medical devices and specialty automotive technology makes ENGT graduates highly desirable in the job market.

The program's faculty play a pivotal role in its success. Professors like Dr. Miodrag Micic and Mr. David Li, both industry certified instructors and well known professionals, with extensive industry experience and connections, maintain strong ties to local companies. These connections facilitate students' job placements, ensuring a smooth transition from education to employment. Alan Jamka's role as both a high school teacher and adjunct faculty member further enhances the program's outreach, helping recruit dual-enrolled students through the Project Lead the Way (PLTW) initiative.

Despite these strengths, certain challenges exist. The introduction of more theoretical engineering programs has impacted enrollment in ENGT. Counselors sometimes guide students toward these programs, resulting in fewer enrollments in ENGT courses. This trend can delay students' entry into the workforce, as theoretical programs often require more time to complete compared to ENGT's shorter certificate and degree paths. A key strategy for addressing this issue involves educating counselors about the benefits of ENGT, ensuring students understand the employment opportunities available through technical education.

Action Plans for Maintaining and Improving Metrics The ENGT program is committed to continuous improvement to sustain its high performance in success, completion, and employment rates. Several action plans are in place to achieve this:

1. **Developing stackable certificates and degrees:** The program is designing modular pathways that allow students to progress through additional certificates by completing just four more units. This structure will encourage students to continue their education and earn higher-level credentials.
2. **Enhancing competition-based learning:** A new course is being introduced that aligns with engineering competitions such as VEX Robotics and SkillsUSA. This course will provide students with practical experience in teamwork, problem-solving, and innovation, further strengthening their skills for the workforce.
3. **Expanding certification offerings:** The program is adding dedicated courses for advanced certifications in SolidWorks, Autodesk Inventor/Fusion360/AutoCAD, and additive manufacturing, ensuring students remain competitive in the evolving job market.
4. **Exploring a Bachelor of Science program in engineering design technology:** As part of its long-term strategy, the program is evaluating the development of a bachelor's degree. This new offering would attract more students and provide advanced career opportunities in fields such as mechanical design and manufacturing.
5. **Increasing recruitment efforts for underrepresented groups:** College-wide initiatives like the Umoja success program and GoPass program, which provides free transportation, are expected to boost enrollment among African American students from neighboring districts. The program also participates in high school fairs and National Manufacturing Day to attract a diverse pool of students. The development of new soft-products development class will increase the chance of recruiting and retaining female students, a traditionally underrepresented group at ENGT program.
6. **Expanded access to the undeclared major students and general students populations** through the Engineering Technology Club activities will eventually increase enrollment in the program.
7. **Explore international collaboration with Colleges and Universities from Taiwan, China, Serbia, Croatia and Ghana, and other countries** as per individual faculty connections for bringing in international students to ENGT program.

In conclusion, the ENGT program at Cerritos College is a model of excellence in career and technical education, with high success, completion, and employment rates that exceed both district and state averages. The program's integration of certifications, hands-on learning, and industry partnerships ensures that graduates are well-prepared for the workforce. The high Perkins V Core 4 employment indicator underscores the program's ability to produce job-ready graduates, making it one of the most effective educational pathways for students seeking immediate, living-wage employment. With its continuous improvement plans and focus on student success, the ENGT program is well-positioned to maintain its leadership in technical education for years to come.

4. List any licensure/certification exam(s) required for entry into the workforce in the field of study and report the most recent pass rate(s) among program graduates. Identify performance benchmarks set by regulatory agencies and based on the program's benchmarks, describe the status of any action plans for maintaining/improving the pass rates.

In the field of engineering design technology, no government-mandated licensure or certification is required for employment. However, voluntary certifications play a crucial role in enhancing the employability, job mobility, and professional growth of drafters, CAD operators, and engineering designers. Certifications signal to employers that an individual has achieved a specific level of expertise, helping to differentiate candidates in a competitive job market. The ENGT program at Cerritos College has strategically integrated industry-standard certifications into its curriculum to ensure that students graduate with the credentials necessary to succeed and advance in their careers.

Key certifications offered through the ENGT program include the Certified SolidWorks Associate (CSWA), Certified SolidWorks Professional (CSWP), CSWP-Advanced Specialties, as well as Autodesk Certified User (ACU) and Autodesk Certified Professional (ACP) for software tools such as SolidWorks, Fusion360, AutoCAD and Inventor. These certifications provide students with the knowledge and skills needed to operate industry-standard CAD tools and demonstrate mastery in specific areas of engineering design. By preparing students to pass these exams, the ENGT program ensures that graduates are highly competitive in the job market and positioned for both horizontal and vertical mobility within their careers.

Cerritos College has adopted a unique approach to certification by integrating these exams directly into the curriculum as final assessments in relevant courses. This model ensures that students graduate not only with a degree or certificate but also with industry-recognized credentials that validate their skills. For example, students enrolled in ENGT259 (SolidWorks) are prepared for the CSWA exam, while advanced students in courses such as an ENGGT260, ENGT261 ENGT262, ENGT263 design can take the CSWP or CSWE exams. Similarly, courses focused on Autodesk software (ENGT103, ENGT1378, ENGT138, ENGT257), prepares students for ACU and ACP certifications. The pass rates for these voluntary certifications are consistently high, reflecting both the quality of instruction and the expertise of faculty members. Professors like Dr. Miodrag Micic and Mr. David Li, who hold advanced certifications from Dassault Systèmes and Autodesk, ensure that students are well-prepared for these exams. Dr. Micic holds the distinction of being a Certified SolidWorks Expert (CSWE) and an Accredited SolidWorks Educator, while Mr. Li is a multiple Certified SolidWorks Professional (CSWP) and has significant experience in tooling design for plastics manufacturing. Their combined expertise provides students with in-depth knowledge and practical insights, increasing the likelihood of success on certification exams. While the ENGT program focuses on industry-recognized software certifications, long-term plans include expanding certification offerings to encompass professional association certifications such as those provided by the American Design Drafting Association (ADDA). The ADDA Certified Drafter credential is widely respected and would offer students additional professional recognition. Another future goal is to offer preparation for the Certified Manufacturing Engineer (CMfgE) certification through the Society of Manufacturing Engineers (SME). This certification would complement the program's focus on manufacturing design and engineering, further expanding graduates' career opportunities. The program's benchmarks for pass rates aim to maintain at least 85% success across all certification exams. The strategy for maintaining and improving these pass rates includes several key initiatives:

1. **Enhanced exam preparation:** Currently in design, new certification oriented course include comprehensive study materials, practice exams, and mock tests to ensure students are well-prepared. Faculty also offer additional tutoring and office hours focused on certification preparation.
2. **Professional development for faculty:** Instructors participate in continuous professional development to stay current with the latest industry tools and standards. This ensures that students receive instruction aligned with current best practices and exam requirements. Faculties will participate in SolidWorks World and Autodesk Universe conferences to learn the latest in the field.
3. **Integration with extracurricular activities:** Certification preparation is reinforced through the ASCC Engineering Technology Club. Students participating in competitions such as VEX Robotics and SkillsUSA gain practical experience that complements their coursework, further enhancing their readiness for certification exams.
4. **Long-term collaboration with professional associations:** The program is exploring partnerships with ADDA and SME to offer workshops and exam preparation sessions. These partnerships would provide students with access to additional resources and mentorship from industry professionals.

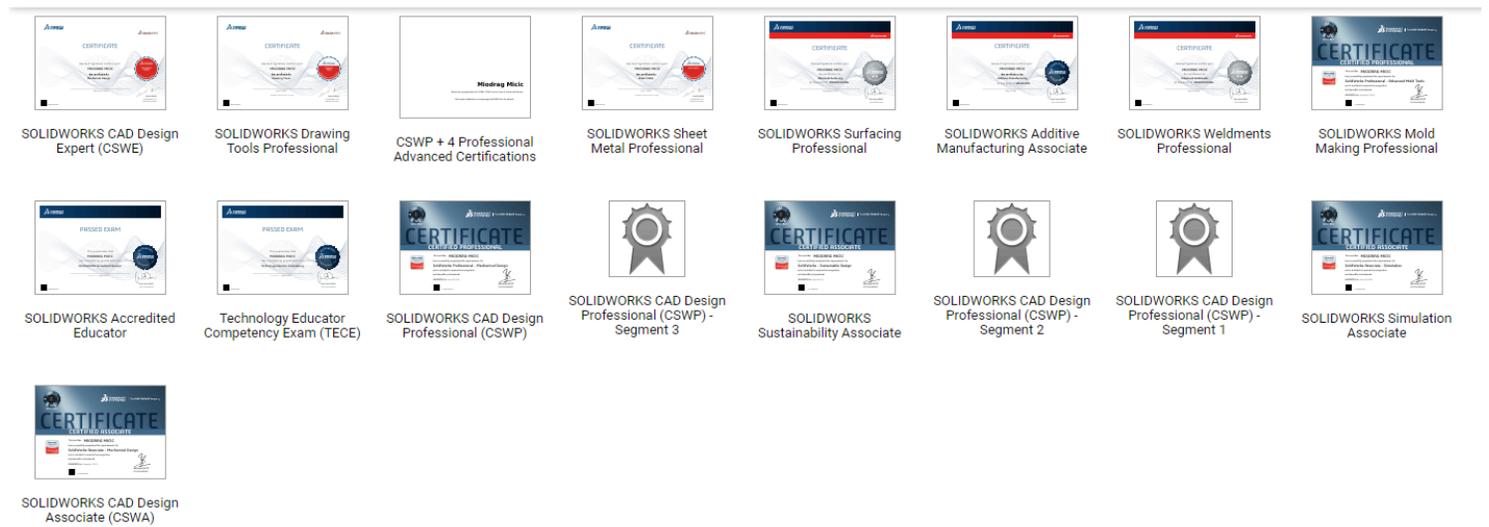


Figure 12: SolidWorks professional certifications offered through the Cerritos College ENGT department. Proctored testing is done at ENGT computer labs. The Certificates are issued after passing test by Dassault Design Systems. Each of the SolidWorks based ENGT class is associated with appropriate CSWA or CSWP certification as final exam. Screenshot of Dr. Micic's certificates, including Certified SolidWorks Expert (CSWE) and Accredited SolidWorks Educator.

In summary, while government-mandated licensure is not required for employment in the field of engineering design technologies, the voluntary certifications offered through the ENGT program at Cerritos College significantly enhance graduates' employability and tip the salary scale upwards. The integration of these certifications into the curriculum ensures that students are both academically prepared and professionally credentialed upon graduation. The program's high pass rates reflect its commitment to excellence and its alignment with industry needs. With plans to introduce professional certifications from ADDA and SME, the ENGT program is positioned to further expand its offerings, providing students with even more opportunities for professional growth and career advancement. These initiatives solidify the program's role as a leader in technical education and reinforce its mission to prepare students for successful careers in engineering design and manufacturing.

Section 3. Learning Outcomes Assessment

A. SLO Assessment Report : Version by Micic, Miodrag on 10/25/2024 08:05

Course By SLO	Expected Performance	Performance

B. SLO Assessment Analysis : Version by Micic, Miodrag on 04/22/2025 02:18

1. Explain the frequency (i.e., when and how often) and content of assessment process (e.g., planning, data collection, and results) for the program (e.g., department meetings, advisory boards, etc.). Also, describe the process for reviewing and discussing outcomes data.

The assessment process within the Engineering Design Technology (ENGT) program at Cerritos College is centered around a practical, hands-on approach, ensuring that students gain the necessary skills to meet workforce demands. The Student Learning Outcomes (SLOs) in the ENGT program are distinct in that they are highly tangible and directly related to the practical tasks students must complete as part of their coursework. Each SLO is based on specific, real-world modeling or design tasks, which are evaluated on a binary basis: students either achieve the required outcome or they do not.

One of the strengths of the ENGT program is that all SLOs are task-based and tangible. Whether students are designing a 3D CAD model, building a product prototype, or using simulation software to test part functionality, the outcomes are clear and measurable. This ensures there is no ambiguity in what is expected from the students, allowing them to focus on developing the precise skills they will need in the engineering design field.

Given the nature of these SLOs, which reflect the practical, hands-on work students will perform in their careers, every student's outcome can be directly observed and evaluated. This clarity in objectives helps drive the program's high success rates.

High Success Rates Through Individualized Support. A significant factor contributing to the ENGT program's success is the close, individualized support that students receive from faculty during lab sessions. Faculty members, including experienced professionals like Dr. Miodrag Micic and Mr. David Li, work with each student throughout the course. This allows for immediate feedback and assistance with problems as they arise, ensuring that students are on the right track and capable of meeting the learning outcomes. This individualized approach is complemented by the flexibility in submissions. Faculty members allow students to submit their work multiple times, offering guidance and opportunities for revision until the required SLO is achieved. The SLOs are finally reviewed at the end of the course. This iterative process not only helps students master the skills but also ensures that most, if not all, students ultimately meet the outcomes.

The department's focus on tangible outcomes is further enhanced by a continuous assessment process. Faculty regularly collect and review performance data based on the results of these practical tasks. The program's annual reviews are comprehensive, ensuring that both student performance trends and the relevance of course content to current industry needs are closely monitored. Long-term trends are also considered, with faculty using this data to adapt and update the curriculum as necessary. For example, emerging trends in computer-aided design (CAD) and automation technologies are integrated into the curriculum to ensure students remain competitive in the job market. Feedback from industry advisory boards further informs these revisions, ensuring the program stays aligned with workforce demands.

As the data from SLO assessments are collected, the results are analyzed and discussed among faculty. The emphasis is on maintaining high performance, but the department also remains flexible in addressing areas for improvement. If certain outcomes show lower-than-expected success rates, faculty members develop action plans to address these gaps, whether through additional instruction, revised assignments, or new instructional tools.

In addition, the program ensures that certification opportunities—such as those for Certified SolidWorks Associate (CSWA) or Autodesk certifications—are incorporated into the curriculum, providing students with not only the skills but also the credentials needed to secure employment.

In the ENGT program, the assessment process is built on tangible, binary SLOs that reflect real-world tasks and provide clear, measurable outcomes. The department's focus on individualized support, flexible submission processes, and continuous curriculum adaptation ensures high success rates, with students gaining both the theoretical knowledge and practical

skills they need to thrive in their careers. By maintaining close alignment with industry demands and ensuring all outcomes are directly applicable to real-world scenarios, the ENGT program at Cerritos College stands as a model for technical education success.

2. Describe the process for development of plan for improvement and summarize the changes that discipline faculty plan to implement based on the analysis of the student learning and program effectiveness. Provide specific examples.

The Engineering Design Technology (ENGT) program at Cerritos College follows a systematic and data-driven approach to continuously improve Student Learning Outcomes (SLOs). By analyzing student performance and industry feedback, the department regularly revises its curriculum and instructional strategies to ensure that students meet the necessary competencies. This section will highlight the process for developing improvement plans for SLOs and provide examples of recent changes made to the program to address observed deficiencies and enhance student learning. The process for improving SLOs in the ENGT program begins with a thorough analysis of student performance data, faculty observations, and feedback from industry partners, done once per year. The department regularly assesses how well students meet the SLOs set for each course, paying close attention to areas where students may struggle. Based on this analysis, faculty develop targeted action plans to address any gaps in learning. These plans include revisions to course content, instructional methods, and lab activities, ensuring that the curriculum remains aligned with both academic standards and industry needs.

The department holds Advisory Committee Meetings with industry partners once each semester, at the end of each Fall and Spring semesters. Advisory board input plays a crucial role in shaping these plans. Industry professionals provide at least twice per year feedback on the evolving skills and knowledge required in the workforce, which helps the department ensure that its SLOs are up-to-date and reflective of real-world demands. A prime example of how this process led to improvements in the ENGT program is the revision of ENGT116 (Blueprint Reading). Faculty observed that many students exhibited deficiencies in producing 2D illustrations and detailed technical drawings, which are critical skills for engineering designers. The original version of ENGT116 was a 2-credit hour course, but it became apparent that more instructional time was needed to adequately address these skills. To resolve this issue, the department expanded ENGT116 into a 4-unit course, allowing for additional lab time and deeper instruction on key topics like dimensioning, tolerancing, and advanced drawing techniques. The course revision also introduced preparation for the Certified SolidWorks Professional (CSWP) Advanced Specialty Drafting exam, providing students with an industry-recognized certification that validates their 2D drafting abilities. This adjustment ensured that students were better prepared to meet industry expectations and improved the overall achievement of SLOs in the course. Another recent improvement involved the conversion of PMT52 (2.5 units) into ENGT152 Composites Fabrication (4.0 units). Faculty identified that many newly graduated high school students lacked basic hands-on skills, including proficiency in basic measurements and the use of cutting instruments. These skills are fundamental for working with composites and other materials in a manufacturing environment. The shorter duration of PMT52 limited the time available for students to fully develop these critical skills. By extending the course to 4 units, the department increased the amount of lab time available for students to practice and master these essential skills. The additional time allowed faculty to provide more individualized attention and ensure that each student met the required SLOs. The course revision also included enhanced instruction on safety protocols, tool handling, and precision measurements, which are vital components of the composites fabrication process. This change not only improved student outcomes but also ensured that graduates are better prepared for entry-level positions in the composites industry.

Faculty-Led Solutions and Flexible Teaching Approaches

One of the key strengths of the ENGT program is the flexible teaching approach employed by faculty. In both examples of course revisions, faculty provided multiple opportunities for students to submit their work and improve upon it until they met the SLOs. This approach fosters a culture of continuous improvement and ensures that all students have the support they need to succeed. Faculty members work closely with students during lab sessions, offering real-time feedback and guidance to help them develop the necessary skills. The ENGT department's process of continuous assessment ensures that improvements are data-driven and aligned with both student needs and industry requirements. By regularly reviewing student performance data and analyzing the effectiveness of course revisions, the department ensures that any deficiencies in learning are quickly addressed. This proactive approach allows the ENGT program to stay ahead of emerging trends in engineering design technology and provide students with the skills and knowledge they need to succeed in their careers.

The department also remains open to future adjustments based on new industry developments. For example, the increasing use of AI and automation in design processes may lead to additional changes in the curriculum to ensure students remain competitive in the workforce.

The ENGT program's approach to SLO improvement is comprehensive and responsive to both student performance data and industry feedback. By expanding courses such as ENGT116 Blueprint Reading and ENGT152 Composites Fabrication, the department has addressed observed deficiencies and provided students with the time and resources needed to achieve the required outcomes. Through continuous assessment, flexible teaching strategies, and the integration of industry certifications, the ENGT program ensures that its graduates are well-prepared for the demands of the job market and equipped with the skills needed to thrive in their careers.

In the ENGT program, we evaluate Student Learning Outcomes (SLOs) every semester to track trends and maintain consistent monitoring of student performance. However, we do not assess all SLOs or create action plans every semester. Instead, we follow a cyclical approach where formal action plans are developed every three years as part of our program review process. This timeline allows us to use the observed trends and data from semester evaluations, along with feedback from industry advisers, emerging trends, and other external factors, to inform program revisions comprehensively. This structured yet flexible schedule ensures that our program aligns with industry needs and supports meaningful improvement without overwhelming our limited resources currently of only two full time instructors and one active part time instructor.

C. Curricular Course Review : Version by Micic, Miodrag on 04/24/2025 04:33

1. Provide the curriculum course review timeline to ensure all courses are reviewed at least once every six years.

All of the active courses in ENGT, ET, PMT, NPD were reviewed in the last six years time-frame. We have added distance education options to most of the courses to help students during the COVID-19 disaster. The Engineering Design Technology (ENGT) program at Cerritos College maintains a rigorous curriculum review process to ensure that all courses remain relevant, aligned with industry demands, and reflective of best practices in education. Following college policy, every course is reviewed at least once within a six-year cycle. This structured timeline ensures that the program keeps pace with evolving technological advancements, workforce needs, and educational standards. During the COVID-19 pandemic, the ENGT program undertook a significant curriculum revision to incorporate distance education components across all courses. This effort ensured continuity in learning, enabling students to continue their studies remotely during the crisis. Faculty members worked collaboratively to adapt assignments, lectures, and laboratory activities for online delivery while maintaining the rigor and hands-on learning that characterize the program. While in-person instruction remains essential for many technical courses, the introduction of hybrid options provides flexibility for students balancing work, family, and education. Moving forward, the curriculum will be reviewed continuously to address the changing needs of local industries. Dr. Miodrag Micic's sabbatical study will play a pivotal role in guiding these revisions, providing insights into emerging trends, skill gaps, and future workforce demands. As part of this initiative, the program will introduce new course offerings in areas such as robotics, additive manufacturing, and artificial intelligence applications in engineering design. At the same time, courses that no longer align with current industry needs will be retired or restructured to ensure that students receive training that is both practical and relevant. The ENGT program recognizes that curricular revisions are an ongoing process, particularly in an industry undergoing rapid transformation due to new technologies, such as artificial intelligence (AI). The impact of AI on design and manufacturing processes is expected to reshape the way products are developed, and the program is committed to staying ahead of these changes. Faculty members will monitor trends in AI-driven design tools, automated manufacturing, and Industry 4.0 technologies, ensuring that course content is updated promptly to reflect these advancements.

This proactive approach to curriculum management is essential in a fast-evolving field like engineering design technology. The department's faculty members, including Dr. Micic, Mr. David Li, and Mr. Fergus O'Farrell, are well-connected with industry leaders and actively participate in professional development. This allows them to stay informed about new technologies, tools, and methodologies that shape the industry. These insights are integrated into the curriculum in real-time, ensuring that students learn not only foundational concepts but also the latest techniques used by leading companies.

In summary, the ENGT program at Cerritos College follows a structured curriculum review timeline, ensuring that all courses are evaluated at least once every six years. The curriculum was recently adapted to incorporate distance education components during the COVID-19 pandemic, reflecting the program's commitment to flexibility and student success. Looking ahead, continuous curricular revision will remain a priority, guided by local industry needs and insights from Dr. Micic's sabbatical study. This commitment to continuous improvement ensures that the ENGT program will remain a leader in engineering design education, preparing students for successful careers in a dynamic and fast-changing industry.

2. Explain any course additions to current course offerings.

The ENGT program at Cerritos College will expand its course offerings to meet the evolving needs of students and industry. As part of its commitment to enhance hands-on learning and certification preparation Three new courses have been introduced: ENGT100L (Student Competitions) ET105 (Artificial Intelligence for Engineering Technology) and ENGT200L (CAD Certification Preparation). These courses reflect the program's strategy to strengthen practical skills, boost engagement through competitions, and ensure students achieve industry-recognized certifications. As courses outlines are currently going through the curriculum approval process, we plan to offer those courses starting from Spring 2026. The first courses which

are going to be offered in Spring 2026 are ET105 Artificial Intelligence for Engineering Technology, and ENGT100L Students Competitions. In Summer 2026 we will offer ENGT200L CAD Certifications Preparation.

ENGT100L: Student Competitions

ENGT100L is designed as a 1.5-unit lab-based course that emphasizes practical design and teamwork through participation in engineering competitions. The course is repeatable up to six times, allowing students to continuously improve their skills, participate in multiple competitions, and build a portfolio of real-world projects. Students engage in competitions such as VEX Robotics, SkillsUSA, and WEX Robotics, where they design, prototype, and fabricate engineering systems, including robots, drones, and composite structures. This course offers students the opportunity to apply their classroom knowledge in a competitive setting, fostering creativity, problem-solving, and teamwork. ENGT100L aligns with activities organized by the ASCC Engineering Technology Club, encouraging extracurricular involvement and building leadership skills. The course's repeatable structure ensures that students can participate in diverse projects and develop advanced competencies over time. The emphasis on competitions also builds connections with industry and enhances students' employability by providing experience with real-world engineering challenges. This course will be offered for the first time in Spring 2026, and we plan to offer it every semester.

ENGT105: Artificial Intelligence for Engineering Technology

ENGT 105, Artificial Intelligence for Engineering Technology, immerses students in the rapidly evolving intersection of generative AI and applied design practice by guiding them through sequence of projects that use tools such as ChatGPT, Microsoft Copilot, and domain-specific bots to streamline technical writing, automate literature and patent discovery, generate parametric models, optimize Fusion 360 geometries, produce standards-compliant drawings, and create data driven visualizations. Grounded in equity minded pedagogy, the course pairs conceptual discussions of ethical AI deployment and intellectual property stewardship with hands on labs in which learners prompt, fine tune, and critically evaluate machine outputs for clarity, accuracy, and bias. By the end of the term students can draft hybrid reports, script spreadsheet automations, generate electronics schematics, and prepare submission ready presentation assets, all while documenting repeatable AI workflows that meet industry audit requirements. Positioned early in the ENGT curriculum, ENGT 105 empowers drafters, technologists, and transfer bound engineers alike to wield artificial intelligence as a collaborative partner, accelerating design cycles and amplifying creative problem solving across every subsequent class and workplace setting. This course we plan to offer for the first time in Spring 2026.

ENGT200L: CAD Certification Preparation, ENGT200L is a 1.5-unit course focused on preparing students for industry-standard CAD certifications, such as CSWA, CSWP, CSWE, ACU, and ACP. The course is repeatable up to four times, allowing students to prepare for multiple certifications and continuously develop their CAD expertise. This course reflects the program's commitment to integrating certifications into the curriculum, ensuring students graduate with the credentials needed to succeed in the workforce. Through ENGT200L, students receive targeted instruction, practice exams, and hands-on guidance from experienced faculty members, including Dr. Miodrag Micic and Mr. David Li, both of whom hold advanced CAD certifications and bring industry expertise to the classroom. This course we will offer in Summer 2026.

The repeatable format of the course allows students to progress from entry-level certifications, such as CSWA and ACU, to advanced credentials, including CSWP-Advanced Specialties and CSWE. This structure ensures students remain competitive in a job market that increasingly values CAD proficiency.

Strategic Impact of New Courses These new courses support the program's long-term strategy to enhance student engagement, promote continuous learning, and align with industry needs. ENGT100L and ENGT200L encourage students to develop practical skills that go beyond the classroom, fostering deeper learning through competitions and certifications. The repeatable nature of both courses allows students to build on their knowledge and competencies throughout their academic journey, ensuring they are prepared for diverse career opportunities. ENGT100L provides students with a competitive edge by enabling them to collaborate on real-world projects and showcase their skills to potential employers. Similarly, ENGT200L ensures that students achieve industry-recognized certifications, validating their expertise and positioning them for higher-paying jobs and career advancement. These courses address both academic and career needs, enhancing students' readiness for immediate employment and long-term success.

In conclusion, the addition of ENGT100L and ENGT200L represents a strategic enhancement of the ENGT program's curriculum. These courses reflect the program's focus on experiential learning, certification preparation, and student engagement. By participating in engineering competitions and achieving advanced CAD certifications, students gain practical experience and credentials that set them apart in the job market. These new offerings underscore the ENGT program's commitment to continuous improvement and its role as a leader in career and technical education at Cerritos College.

3. Explain any course deletions and inactivation's from current course offerings.

The Engineering Design Technology (ENGT) department at Cerritos College has undertaken a thoughtful process of deactivating courses that are no longer relevant to the current demands of industry or student interests. This process is part of a broader effort to ensure that the program remains aligned with employer expectations and the evolving landscape of engineering technology, while also providing students with a clear, scalable pathway to completion. One of the key reasons for course deactivations in the ENGT program has been the obsolescence of certain software tools. For example, courses related to CATIA V5 and Autodesk Mechanical Desktop have been deactivated because these software platforms are either no longer in use or no longer widely demanded by industry employers. CATIA, once a major player in aerospace design, has seen reduced relevance as industry demands have shifted toward other tools such as SolidWorks, Autodesk Inventor, and Fusion 360. Similarly, Autodesk Mechanical Desktop has been replaced by more modern, integrated CAD platforms, making the course content outdated for today's job market. By deactivating these courses, the department has been able to focus its resources on up-to-date software that students are more likely to encounter in the workplace. These decisions ensure that students receive current and practical training, directly applicable to their future careers. In addition to deactivating courses for outdated software, the department has also retired courses that have not garnered sufficient student interest. Courses such as NPD106, NPD107, NPD108 (focused on new product development) and MTT111, MTT112, MTT113 (focused on maintenance, PLC programming and HMI programming) have been retired due to low enrollment over a two-year cycle. These courses, while once relevant, no longer align with the broader interests of the student body, as the program shifts its focus to automated manufacturing technologies, advanced CAD modeling, and composites fabrication.

These deactivations free up space for new course offerings that will better serve both students and industry. The decision to retire under-enrolled courses also ensures that resources are efficiently allocated, with a focus on areas that will provide the most benefit to students' employability.

Looking forward, the ENGT department is currently in the process of evaluating additional course deactivations and overall program streamlining. This involves reviewing courses that may no longer align with industry needs or that have consistently struggled with enrollment. As part of this effort, the department is also planning to introduce new courses that reflect emerging technologies and industry requirements.

An important consideration in this process is the need to ensure a smooth transition for students who have taken courses in the past. To achieve this, the department plans to reuse course "containers"—a strategy that allows older courses to be redefined under a new curriculum structure, thus maintaining continuity for students. This approach ensures that students who have already completed parts of the program can continue progressing without disruption, while new students benefit from updated content and modernized course offerings. A key goal of the department's curriculum reform is to create a fully scalable and foldable program. This structure would allow students to earn multiple certificates by building on a single foundation, where each certificate naturally leads to the next level of competency. Ultimately, this stackable approach would culminate in the Associate of Arts (AA) degree, providing students with a clear path from entry-level skills to advanced knowledge in engineering design technology. This modular design ensures that students can earn credentials at various stages of their academic journey, giving them the flexibility to enter the workforce early or continue their education toward a full degree. It also allows students to customize their learning experience based on their career goals, while ensuring that all paths are aligned with the latest industry standards. The ENGT department is also exploring the potential for creating a Bachelor of Science (BS) in Engineering Design Technology. The goal of this initiative is to provide students with advanced education and training that would prepare them for higher-level positions in industries such as aerospace, automotive, and product design. A bachelor's program would build on the existing curriculum, offering students the opportunity to delve deeper into advanced manufacturing technologies, automation, and sustainable design practices.

This initiative is still in the exploratory phase, but it reflects the department's long-term commitment to providing students with advanced career opportunities and ensuring that the program remains at the forefront of technical education

The deactivation of outdated and under-enrolled courses, along with the planned introduction of new and relevant course offerings, reflects the ENGT department's dedication to maintaining a dynamic and responsive curriculum. By eliminating courses that no longer serve student or industry needs—such as those related to CATIA V5, Autodesk Mechanical Desktop, and various low-enrollment courses—the department is ensuring that its resources are focused on areas of high demand. At the same time, the department is working on creating a scalable, foldable program that provides students with a clear and customizable path to success, from earning certificates to obtaining an AA degree. The exploration of a bachelor's program further demonstrates the department's forward-thinking approach, ensuring that Cerritos College remains a leader in engineering design education and continues to provide students with the skills and qualifications they need to thrive in the workforce.

4. Discuss how well the courses, degrees, and/or certificates meet students' transfer or career training needs. Consider the following questions:

- Have all courses that are required for the program's degrees and certificates been offered during the last two years? If not, has the program established a course offering cycle?
- How has degree and/or certificate completion changed over time?
- Are there sufficient completers compared with the size of your program?

The Engineering Design Technology (ENGT) program at Cerritos College has been proactive in offering a curriculum designed to align with student needs for both career training and transfer opportunities. Over the last two years, most of the required courses for degrees and certificates have been offered to meet programmatic goals and maintain student progress. However, certain courses have experienced scheduling adjustments due to enrollment variations and strategic efforts to balance course offerings. The program follows a course offering cycle, ensuring that even low-enrollment courses remain accessible within a reasonable timeframe, typically within two academic years. This structured rotation allows students to complete their degrees and certificates without delays. During the COVID-19 pandemic, the program incorporated distance education components across all courses, ensuring continuity of education. While these changes were necessary, the ENGT program recognizes the importance of in-person instruction for developing hands-on skills essential for the field and is now realigning toward more on-campus learning experiences. The data reveal both short- and long-term trends in degree and certificate completions. The ENGT program has shown resilience, maintaining stable completion rates despite fluctuations in enrollment. In recent years, the introduction of stackable certificates has contributed to a steady increase in completions, as students are encouraged to earn multiple certifications by completing a few additional units. The modular structure of the curriculum allows students to transition seamlessly from one certificate to the next, promoting continuous academic and professional development.

Looking at historical trends, the number of awarded degrees and certificates has remained relatively stable over the past six years. However, the ENGT program recognizes that increased focus on recruitment and retention could further boost completions. Outreach efforts targeting underrepresented communities and initiatives such as the GoPass program have already shown promise in enhancing enrollment among African American students from neighboring districts.

Program Size and Completers

In comparison to the size of the ENGT program, the number of completers is sufficient to meet both academic and industry expectations. The modular certificate structure has made it easier for students to earn multiple credentials, often securing entry-level jobs even before completing their full program. Courses like ENGT259 SolidWorks are particularly effective, with some students gaining employment after taking just one class.

The program has also benefited from close faculty-industry connections, which facilitate employment placements and internships, enhancing the likelihood of successful career outcomes. Completion trends are supported by employment metrics that show high job placement rates for ENGT graduates, many of whom secure living-wage jobs immediately upon graduation. As the industry evolves with new technologies, the ENGT program remains committed to continuous improvement. One key initiative is to introduce additional courses focused on industrial certifications, such as those from SolidWorks and Autodesk, which will ensure students stay competitive in the job market. Additionally, new course offerings aligned with engineering competitions—such as VEX Robotics and SkillsUS will provide students with practical design experience and boost their engagement. The program is also exploring the possibility of introducing a Bachelor of Science in Engineering Design Technology to attract more students and offer advanced career opportunities. The curriculum review process will remain ongoing, ensuring alignment with the latest industry trends and technologies.

In conclusion, the ENGT program at Cerritos College continues to meet students' needs for career training and transfer opportunities by maintaining a robust course offering cycle, achieving stable completion rates, and ensuring that completers align with the size of the program. With continuous curricular adjustments and strong industry connections, the program is well-positioned to adapt to the evolving demands of the job market and support students in achieving their academic and career goals.

Finally the ENGT department is run efficiently with only two full time instructor and one part time instructor. We expect to be able to grow the program and to add section and hire additional highly qualified diverse instructors during the next review period.

5. Are any licensure/certification exams required for program completion or career entry?

- If so, what is the pass rate among graduates?
- Set an attainable, measurable goal for pass rates and identify any applicable performance benchmarks set by regulatory agencies.

The ENGT program at Cerritos College does not require government-mandated licensure or certification exams for program completion or entry into the workforce. However, voluntary industry certifications are highly recommended and widely pursued by students. These certifications, such as Certified SolidWorks Associate (CSWA), Certified SolidWorks Professional (CSWP), CSWP-Advanced Specialties, Certified SolidWorks Expert (CSWE), Autodesk Certified User (ACU), and Autodesk Certified Professional (ACP), play a crucial role in enhancing students' employability. They validate technical skills, facilitate both horizontal and vertical job mobility, and signal job readiness to employers. The ENGT program incorporates these industry-standard certifications directly into its coursework as final assessments. Courses like ENGT259 (SolidWorks) and other CAD-focused classes culminate with certification exams that test students' mastery of relevant software and tools. While the certifications are not required for graduation, they are strongly encouraged, as many employers prefer candidates with validated credentials. In recent years, the program has achieved pass rates ranging from 85% to 90% for certifications such as CSWA, CSWP, and ACU. This high pass rate reflects the program's commitment to academic excellence and the practical expertise of its faculty. Professors like Dr. Miodrag Micic and Mr. David Li, both of whom hold advanced certifications, ensure that students receive comprehensive exam preparation through study guides, mock tests, and one-on-one mentoring. This preparation contributes to students' high performance on exams, reinforcing the program's alignment with industry expectations. The ENGT program aims to maintain or exceed a minimum pass rate of 85% across all certification exams. This goal is based on historical data and reflects both the current performance of students and the faculty's commitment to continuous improvement. The following initiatives will support the program in achieving this goal:

1. Targeted preparation courses: New courses focusing on exam preparation for advanced certifications, such as CSWP-Advanced Specialties and CSWE, will be introduced to enhance student readiness.
2. Performance tracking: Faculty will implement regular assessments to monitor students' progress throughout the semester, allowing for early intervention and additional support as needed.
3. Partnerships with professional associations: As part of the long-term strategy, the program is exploring opportunities to offer certifications from the American Design Drafting Association (ADDA) and the Certified Manufacturing Engineer (CMfgE) certification from the Society of Manufacturing Engineers (SME). These credentials would complement existing certifications and provide students with even broader career opportunities.

While there are no regulatory agencies that mandate certification exams for drafters or engineering designers, the program benchmarks its performance against industry standards. The goal of maintaining 85% pass rates aligns with employer expectations for job-ready graduates. Certifications such as CSWP and ACP signal to employers that candidates possess proficiency in essential tools, making them highly competitive in the workforce. The ENGT program at Cerritos College leverages industry certifications to enhance students' career prospects and ensure they are prepared to meet workforce demands. With pass rates currently ranging from 85% to 90%, the program is on track to meet its goal of maintaining high certification success. Through ongoing curricular enhancements, targeted preparation, and partnerships with professional associations, the program will continue to equip students with the credentials needed for career advancement. This commitment to continuous improvement ensures that ENGT graduates remain among the most employable and sought-after candidates in their field not only locally but at the State level as well as nationwide. ENGT Department have successful alumnis working at engineering and engineering technicians jobs.

Section 4. Program Reflection

A. Six-Year Program Reflection : Version by Micic, Miodrag on 04/22/2025 02:18

1. Provide an analysis of your program throughout the last six years, reflecting on student demographics and enrollment. Reflect on any changes you would like to see in your program in the next six years.

Over the past six years, the Engineering Design Technology (ENGT) program at Cerritos College has experienced fluctuations in student demographics and enrollment. These shifts reflect broader trends in career and technical education, as well as the evolving interests and backgrounds of the student population. During this period, the program has shown strong retention

among its traditional student base, which predominantly includes Hispanic and male students, who form the majority of the demographic in the surrounding region. However, the department recognizes the need to attract a more diverse student body, especially in increasing the enrollment of non-traditional completers, such as females and African Americans. Enrollment in the ENGT program has remained relatively stable, though it has experienced periods of slight decline due to external factors such as the COVID-19 pandemic, which affected in-person classes and student engagement. While the department has done an excellent job maintaining interest in fields like CAD drafting, composites fabrication, and advanced manufacturing technologies, there is a clear opportunity to expand outreach to attract more diverse student groups, particularly female students and African American students, who have been traditionally underrepresented in the program.

Currently, the Hispanic population makes up a large percentage of the ENGT program's enrollment, reflecting the demographic makeup of the surrounding community. Male students continue to dominate the field, a trend consistent with national statistics in engineering and manufacturing technology programs. While the program has seen modest growth in enrollment from other ethnic groups, the participation of African American students remains disproportionately low.

Similarly, female enrollment in the program is also below desired levels. This is not unique to Cerritos College, as engineering and technical programs across the country tend to attract fewer women. Despite some progress in promoting STEM fields to young women, there remains a significant gender gap in engineering design and related disciplines. In the next six years, the ENGT program aims to increase diversity by attracting non-traditional students, specifically females and African Americans. This will involve several key initiatives:

1. Introducing Courses and Topics That Appeal to a Broader Audience

One strategy for increasing female participation is to introduce soft product development and topics of interest to women, such as design for consumer goods, wearable technology, and sustainable design solutions. These topics can be integrated into existing courses or introduced as new offerings that focus on product development for the fashion, health, and environmental sectors. By offering a wider variety of project types, the department hopes to appeal to female students, creating a positive buzz that spreads through word of mouth, ultimately encouraging more women to explore the ENGT program.

2. Expanding Outreach to African American Communities

In 2025, the ENGT department plans to significantly increase its outreach efforts to local high schools in traditionally African American communities, such as those in the Compton and Santa Fe Springs areas. These outreach programs will aim to introduce students to the career opportunities available through the ENGT program, with a focus on providing hands-on experiences that showcase the practical, employable skills gained through engineering technology education.

Partnerships with community organizations and high school counselors will be a central component of this effort, ensuring that African American students are exposed to the benefits of pursuing careers in engineering design, drafting, and manufacturing technologies. The GoPass initiative, which provides free transportation to Cerritos College for students from these neighboring districts, will also play a key role in breaking down barriers to enrollment.

3. Counselor Education and Advocacy

A critical part of increasing diversity within the ENGT program is ensuring that high school and college counselors are fully informed about the benefits of enrolling in career and technical education (CTE) programs, particularly for female and African American students. To this end, the department plans to work closely with counseling staff, providing informational workshops that highlight the high earning potential and job security available to ENGT graduates. These workshops will emphasize that programs like CAD drafting, composites manufacturing, and engineering technology not only provide immediate employment opportunities but also pay living wages that can exceed those earned by graduates in more theoretical fields.

This effort is especially important to counteract the misguided push from some counselors toward transfer degrees that may take longer to complete and often result in lower-paying jobs. Educating counselors on the practical advantages of ENGT programs will ensure that students, particularly those from underrepresented groups, are aware of the fast-track pathways available to well-paying jobs in industries such as aerospace, automotive, and product design.

4. Expanding Opportunities Through Scalable Certificates

One of the key changes planned for the next six years is the introduction of a scalable and foldable program structure. This structure will allow students to start with entry-level certificates in areas like CAD or composites manufacturing and progressively work their way toward an Associate of Arts (AA) degree by building on these initial credentials. Each certificate will require the completion of just a few additional units, creating a modular system that supports career mobility.

This stackable system will make it easier for non-traditional students to enter the workforce quickly while continuing their education at their own pace. By offering more flexible pathways, the program can attract students who may otherwise be hesitant to commit to a full degree program.

5. Exploring the Creation of a Bachelor's Program

As the demand for skilled engineering technologists grows, the ENGT department is also exploring the possibility of creating a Bachelor of Science (BS) program in Engineering Design Technology. This would provide students with a four-year degree option that offers advanced training in areas like automation, product design, and robotics, opening up even greater career opportunities. A BS program would also be an attractive option for non-traditional students looking to advance their careers further. Over the last six years, the ENGT program at Cerritos College has maintained a stable student base but recognizes the need to increase diversity among its completers, particularly in terms of female and African American students. Moving forward, the program will focus on creating new course offerings, expanding outreach efforts, and educating counselors about the benefits of ENGT programs. By introducing scalable certificates and exploring the creation of a bachelor's program, the department aims to provide flexible, high-quality education that supports career growth and workforce readiness for all students.

2. What is the six-year trend of degrees and certificates awarded? Is there anything you can do to help increase the number of students who acquire degrees and/or transfer?

Over the past six years, the Engineering Design Technology (ENGT) program at Cerritos College has seen a relatively stable trend in the number of degrees and certificates awarded, but this trend highlights opportunities for growth. While the program has consistently produced graduates who are well-prepared for the workforce, there are several factors that have limited the potential for more students to acquire degrees and certificates, particularly the diversion of students by college counselors to other programs like Engineering (ENGR), as well as the current structure of the certificate and degree requirements. The data from the last six years shows a modest but stable output of degrees and certificates awarded in the ENGT program, with slight variations depending on external factors such as enrollment fluctuations and broader economic conditions. The program has maintained its ability to produce qualified graduates, particularly sought after in fields related to CAD drafting, designing for manufacturing technologies, and new product development. However, there are opportunities for increasing the number of awards by addressing some of the structural issues within the program and external challenges, such as the lack of targeted support from college counselors. In many cases, students interested in practical engineering and technology fields are being diverted to the ENGR program, which often requires more theoretical coursework and may not align with students' immediate career goals nor lead to the living wage earning career in the near future. This diversion leads to fewer students completing ENGT (Engineering Design Technology), ET (Engineering Technology), and NPD (New Products Development) programs, which offer faster paths to employment through certificates and associate degrees. The significant challenges facing the ENGT program is the limited support from counselors, who often redirect students to theoretical transfer programs like ENGR (Engineering for Transfer). This can be problematic for students seeking hands-on, practical skills that would lead directly to employment after graduation. In contrast, the ENGT program provides students with employable technical skills that allow them to enter the workforce quickly and with high earning potential.

To counter this, the ENGT department will need to implement a series of targeted outreach efforts aimed at educating counselors about the value of CTE (Career and Technical Education) ENGT programs. By providing workshops and informational sessions for counselors, the department can emphasize the high demand for skilled workers in fields like CAD drafting, composites manufacturing, and engineering technology. Furthermore, by highlighting the living wages that graduates of these programs can earn—often higher than those with theoretical transfer degrees—the department can advocate for students to be better directed into ENGT programs.

One solution to increasing the number of degrees and certificates awarded is to reduce the unit requirements for entry-level certificates while maintaining the rigor and relevance of the coursework. For example, the ENGT department could introduce 16-unit entry-level certificates for each of the major programs, including ENGT, ET, and NPD. These certificates would provide students with a quick, focused pathway to acquiring essential skills in CAD, manufacturing, and product design. Once students complete these initial certificates, they can continue their education by enrolling in a second-level certificate, requiring an additional 6 units, resulting in a total of 18 units. This stackable and foldable structure ensures that students can earn credentials at multiple stages, allowing them to enter the workforce earlier or continue their education at a later time. Eventually, students would be able to build on their certificates to complete an Associate of Arts (AA) degree, providing a flexible pathway to both employment and further education.

Another strategy to increase the number of students completing certificates and degrees is the introduction of repeatable lab classes. These labs would allow students to refine their skills by working on real-world projects and student competitions, helping them develop the expertise needed to succeed in other ENGT courses. Repeatable certification labs would also provide additional preparation for industry certifications such as Certified SolidWorks Associate (CSWA), Certified SolidWorks Professional (CSWP), and Autodesk certifications, increasing students' chances of passing these exams and improving their employability.

In addition, the department should emphasize soft skills training through courses like ENGT100, which could be made applicable to all AA degrees and offered as a general education course. Soft skills such as teamwork, communication, and project management are increasingly valued by employers, and offering these skills as part of the general education curriculum would attract more students to the ENGT program while improving their chances of success in the workplace.

Expanded Opportunities Through Credit by Exam and Life Experience

To further increase the number of awards, the ENGT department should explore offering more opportunities for credit by exam. This would allow students with prior experience in the field—either through work or self-study—to earn credit for their knowledge, reducing the time needed to complete a certificate or degree. Additionally, the program could offer credit for life experiences that are relevant to the skills taught in ENGT courses, helping students who are already in the workforce fast-track their education.

The six-year trend in degrees and certificates awarded by the ENGT program reflects a stable but under-leveraged program. There is a clear opportunity to increase the number of awards by addressing key challenges, such as the diversion of students to other programs by counselors and the current structure of certificate and degree requirements. By reducing the requirements for entry-level certificates, offering repeatable lab classes, emphasizing soft skills training, and expanding opportunities for credit by exam, the ENGT department can provide students with more flexible pathways to completion. These initiatives, combined with targeted outreach and education efforts for counselors, will help increase the number of students who acquire degrees and certificates, ultimately preparing them for high-demand, high-wage careers in the fields of engineering technology, CAD drafting, and product development.

3. Were there any unplanned events (positive or negative) that affected your program? If so, what were they and how did they affect the program?

Over the past several years, the Engineering Design Technology (ENGT) program at Cerritos College has faced significant challenges and opportunities. From the disruptive effects of the COVID-19 pandemic to the positive growth of local industries, these events have shaped the program's evolution. As the program continues to adapt to technological advances—particularly the rise of artificial intelligence (AI) and generative design and optimization the faculty must remain at the forefront of these changes to ensure that students are equipped with the skills they need to thrive. This section will explore the program's response to these events, its evolving curriculum, and the critical role of faculty development in maintaining the ENGT program as a top-tier leader in the field.

The global COVID-19 pandemic had a significant impact on the ENGT program, as it did on many hands-on technical programs. ENGT courses, which rely heavily on in-person lab work, were forced to shift to an online format during the lockdown. While theoretical aspects of the curriculum could be delivered online, students faced challenges in accessing the specialized tools and equipment needed to complete their practical work and in actually comprehending and mastering the necessary skills. The department implemented a hybrid model, combining online lessons with in-person lab activities where possible, but the hands-on nature of the field made this a less-than-ideal solution. Looking ahead, the ENGT program is preparing for a full return to on-campus learning in Spring 2025, ensuring that students have full access to the equipment, mentorship, and collaborative opportunities needed to develop critical skills in CAD modeling, composites manufacturing, and prototyping. This shift back to face-to-face instruction will restore the immersive learning environment that is crucial for technical education.

Despite the challenges of the pandemic, there have been several positive developments for the ENGT program, particularly the expansion of local industries in Southern Los Angeles County. Major aerospace employers such as SpaceX and Northrop Grumman, along with their subcontractors, have increased their demand for skilled workers in composites manufacturing, mechanical design, and parametric CAD modeling. These industries have created ample employment opportunities for ENGT graduates, with many being hired even before completing their certificates or degrees. While early employment is a positive outcome for students, it has also led to some students delaying the completion of their certifications or associate degrees. To address this issue, the ENGT department plans to offer flexible lab courses and enhanced opportunities for students to return and complete their degrees, even after they have entered the workforce. These strategies will ensure that students can continue to progress in their careers and upskill as industry demands evolve.

The rise of rapid manufacturing technologies, including 3D printing and additive manufacturing, has transformed industries and created new demands for skilled CAD designers and "maker technicians." These technologies enable faster prototyping and more flexible manufacturing processes, making them highly valuable in sectors such as aerospace, automotive, and consumer product design. In response to these changes, the ENGT program has integrated advanced CAD modeling techniques, 3D printing, and rapid prototyping into its curriculum. By staying aligned with industry needs, the program ensures that graduates are equipped with the skills required to succeed in this rapidly evolving field. These technological advancements have also made the ENGT program more attractive to students interested in hands-on design and manufacturing careers.

Another significant and positive trend for the ENGT program has been the renewed interest in Career and Technical Education (CTE) at the high school level, driven by the availability of Strong Workforce Funding. Local high schools, particularly in Southern Los Angeles County, have increased their focus on CTE programs, creating a pipeline of well-prepared students for the ENGT program at Cerritos College. Through articulated agreements with high schools, students who achieve an A, B, or C grade in their CTE classes can earn college credit, which smooths the transition into the ENGT program. Many students begin their college journey through the Bridge K-12 program, allowing them to take college-level courses while still in high school. Some even graduate with Certificates of Achievement or Associate of Arts (AA) degrees at the same time they complete high school, giving them a head start in their careers. This collaboration has been a key factor in maintaining a strong flow of students into the ENGT program and expanding future enrollment.

As the ENGT program continues its curriculum review, a new industrial revolution is on the horizon: the rise of artificial intelligence (AI) in engineering design. AI technologies are beginning to automate repetitive design tasks, streamline workflows, and increase productivity in parametric CAD modeling. Recognizing this emerging trend, Cerritos College faculty are positioning the ENGT program to be at the forefront of AI integration in the field of engineering design technology.

Cerritos College aims to be the first in the state to offer a course focused on the application of AI in engineering technologies. This new course will teach students how to leverage AI-powered tools to optimize design processes, enhance precision, and automate tasks that were traditionally time-consuming. By incorporating AI into the curriculum, Cerritos College will ensure that its students remain competitive in an increasingly automated field. Even as AI technologies streamline design workflows and potentially reduce the number of job openings, students trained in AI applications will be highly sought after and highly paid—even for the entry-level roles in the industry 4.0.

In order to maintain its position as a top-tier program, it is crucial for both full-time and part-time faculty to stay ahead of the latest developments in engineering technology. Faculty members must continuously expand their knowledge and skills by attending leading conferences such as 3D Experience World and Autodesk University, as well as key manufacturing conferences that showcase the latest innovations in design and technology. Moreover, to support this ongoing professional development, faculty need access to comprehensive library resources such as Tooling University, Web of Science, and selected journals and reference works in the field of engineering technology. These resources will enable faculty to stay current with emerging trends and incorporate the latest theoretical knowledge and practical applications into the curriculum. By ensuring that faculty are well-equipped to lead, Cerritos College can continue to provide students with the most up-to-date and relevant education in engineering design technology.

The ENGT program at Cerritos College has successfully navigated the challenges posed by the COVID-19 pandemic, while benefiting from the growth of local industries and the rise of rapid manufacturing technologies. Looking forward, the program is positioning itself to embrace the next wave of technological change with the integration of artificial intelligence into the curriculum. Faculty development will be key to maintaining the program's status as a leader in the field, ensuring that both faculty and students remain at the forefront of engineering technology. By attending leading industry conferences, staying up to date with the latest research through library resources, and offering cutting-edge courses like AI in engineering design, the ENGT program is poised to continue its tradition of excellence. The combination of hands-on learning, industry alignment, and a focus on emerging technologies will ensure that Cerritos College graduates are well-prepared for the evolving demands of the modern workforce.

4. Please describe any recent achievements in your program by faculty and staff who have won awards or distinctions, new projects your program has implemented, committee work, professional development work, conference presentations, community engagement, or recently published work.

The Engineering Design Technology (ENGT) program at Cerritos College has gained notable recognition through its participation in robotics competitions, which provide a platform for students to demonstrate their hands-on engineering skills and apply theoretical knowledge to real-world challenges. One of the program's recent highlights was its exceptional performance at the Gear Slingers x CPSWE Open 2024 VEX University Robotics Tournament, held at Cal Poly San Luis Obispo. Led by ENGT Instructor David Li, the Cerritos Robotics Club secured the prestigious Judges' Award and finished with a strong ranking—fifth out of sixteen teams. What makes this achievement even more significant is that the Cerritos College students outperformed many teams from California State University (CSU) and University of California (UC) campuses. This accomplishment demonstrates the technical expertise, problem-solving abilities, and collaborative spirit of the ENGT students, placing them above groups from larger universities that typically have more resources and visibility. The Cerritos team's ability to outperform these university groups highlights the strength of the ENGT program's practical approach to education, where students not only learn theoretical concepts but also gain extensive hands-on experience. The tournament involved complex tasks, requiring teams to design, build, and program robots to perform specific operations. The Cerritos College team's exceptional performance in these areas showcases the comprehensive skill set they've developed through the ENGT program.

This achievement also reflects the program's emphasis on innovation and adaptability. The robotics competition required students to apply a broad range of skills, from mechanical design to software programming, while collaborating in a fast-paced, competitive environment. The fact that Cerritos students were able to surpass teams from prominent CSU and UC campuses further underscores the high-quality education offered by the ENGT program and its ability to produce graduates who are ready for industry challenges. Participation in robotics competitions not only boosts students' technical proficiency but also strengthens their networking opportunities. These events often attract representatives from top engineering firms, giving students the chance to connect with potential employers and explore career opportunities. The Cerritos ENGT students' success in these competitions makes them highly sought after by companies in aerospace, manufacturing, and product design industries. In conclusion, the performance of Cerritos College's ENGT students in the VEX University Robotics Tournament highlights the program's excellence and its ability to prepare students for competitive environments. By outperforming teams from CSU and UC, the ENGT program has positioned itself as a leading force

in engineering design technology education. The program's focus on project-based learning and industry-aligned skills ensures that its graduates are well-equipped for the demands of today's technological landscape.

At the heart of the ENGT program's academic success is its department chair, Dr. Miodrag Micic, Sc.D., Ph.D., whose research and scholarly contributions have elevated the profile of Cerritos College both regionally and internationally. Since the last program review, Dr. Micic has published four major papers, contributing to fields of engineering technologies such as nanotechnology, surface chemistry, and biosensing. His recent publications, since last Program Review include:

1. Shiv K. Sharma, **Miodrag Micic**, Shanghai Li, Benjamin Hoar, Suraj Paudyal, Elsayed M., Zahran, & Roger M. Leblanc. (2019). Conjugation of carbon dots with β -galactosidase enzyme: Surface chemistry and use in biosensing. *Molecules*, 24(18), 3275. <https://www.mdpi.com/1420-3049/24/18/3275> (<http://https://www.mdpi.com/1420-3049/24/18/3275>)
2. Shiv K. Sharma, Elif S. Seven, **Miodrag Micic**, Shanghai Li, Roger M. Leblanc (2018). Surface chemistry and spectroscopic study of a cholera toxin B Langmuir monolayer. *Langmuir*, 34(7), 2557-2564 <https://doi.org/10.1021/acs.langmuir.7b04252> (<https://doi.org/10.1021/acs.langmuir.7b04252>)
3. Suraj Paudyal, Ganesh Sigdel, Sujit K Shah, Shiv K. Sharma, John D. Grubb, **Miodrag Micic**, Luciano Caseli, Roger M. Leblanc. (2022). Interfacial behavior of Proteinase K enzyme at air-saline subphase. *Journal of Colloid and Interface Science*, 616(7), 701-708 <https://doi.org/10.1016/j.jcis.2022.02.084> (<https://doi.org/10.1016/j.jcis.2022.02.084>)
4. Shanghai Li., **Miodrag Micic**. (2019). High-performance density gradient media for purification of leukocytes from blood: MP Biomedicals describes formulations that isolate mononuclear and polymorphonuclear cells. *Genetic Engineering & Biotechnology News*, 39(15), 26–27. <https://www.genengnews.com/insights/high-performance-density-gradient-media-for-purification-of-leukocytes-from-blood/> (<http://https://www.genengnews.com/insights/high-performance-density-gradient-media-for-purification-of-leukocytes-from-blood/>)
5. **Miodrag Micic**, (2024) Artificial intelligence in Career Technical Education, *Rostrum*, in press, <https://asccc.org/resources/rostrums> (<https://asccc.org/resources/rostrums>)

He is currently working on 4 additional article manuscripts, and one book which will be submitted for reviews shortly. To see list of all of his publications you can go to Google Scholar profile here <https://scholar.google.com/citations?user=N5emUGQAAAAJ&hl=en> (<https://scholar.google.com/citations?user=N5emUGQAAAAJ&hl=en>)

Cerritos College's inclusion in the AD Scientific Index is a remarkable achievement, as it primarily ranks four-year research institutions on their scholarly output and impact. Cerritos College ranks 832 out of 2,123 ranked institutions (mainly 4 years research Universities) in the United States, which ranks Cerritos College in the 39 upper percentile of all US research Universities, and practically ahead of any other community college. The ranking can be found here <https://www.adscientificindex.com/university/Cerritos+College/> (<https://www.adscientificindex.com/university/Cerritos+College/>)

The good portion of the ranking can largely be attributed to the outstanding research work of Dr. Micic and his contributions to the scientific community. Dr. Micic's high citation count and prolific publishing record are significant factors in the college's position in the index. This distinction is incredibly rare for two-year institutions, underscoring the exceptional academic environment cultivated at Cerritos College Engineering Design Technology Department and the high caliber of its faculty.

To maintain the program's competitive edge and ensure that both students and faculty remain at the forefront of emerging technologies, the ENGT faculty regularly engage in professional development. Faculty members, including Dr. Micic and Instructor David Li, actively participate in leading industry conferences such as 3D Experience World and Autodesk University, which provide insights into the latest trends in engineering technology and advanced manufacturing.

These conferences allow faculty to stay current on the newest developments in parametric modeling, artificial intelligence in design, and rapid prototyping. In turn, the knowledge gained at these events directly benefits ENGT students, ensuring that the program's curriculum remains aligned with industry needs. Additionally, faculty access to essential resources such as Tooling University, Web of Science, and key engineering journals ensures that they are continuously updated on both practical and theoretical advancements.

The achievements of the ENGT program and its faculty, have significantly enhanced the academic standing of Cerritos College. From winning robotics competitions to publishing cutting-edge research, the program has firmly established itself as a leader in engineering design technology education. The faculty's ongoing commitment to professional development and research excellence ensures that Cerritos College remains a top choice for students seeking hands-on technical training and a strong foundation for successful careers in engineering design. As the highest-published scholar at the college, Dr. Micic's contributions, combined with the accolades of the ENGT students, continue to elevate the reputation of Cerritos College as a premier institution in the field of applied engineering technology.

5. Provide a status update on goals from the last program review cycle.

The Engineering Design Technology (ENGT) program at Cerritos College has faced unprecedented challenges over the past few years, particularly due to the COVID-19 pandemic. This disruption significantly impacted enrollment and engagement levels, particularly as counselors directed students toward the theoretical Engineering (ENGR) program. Despite these hurdles, we are now entering a phase of revitalization and growth, with ambitious plans to enhance the program over the next six years.

One of the primary goals outlined in the annual plan was to upgrade the computer labs to enhance the learning experience. In the last review cycle, we achieved partial upgrades with the installation of single-screen computers. However, in the coming cycle, we plan to further enhance the learning environment by updating these workstations to dual-screen setups. This upgrade will enable students to effectively use advanced software applications, including SolidWorks and Autodesk, significantly improving the quality of instruction. Additionally, the acquisition and installation of the BigRep 3D printer have already made a positive impact across all classes. This state-of-the-art equipment has enhanced our additive manufacturing capabilities, providing students with hands-on experience that aligns with industry standards.

While there was a strong emphasis on developing a program in inspection and nanotechnology, progress has been limited. Two primary factors contributed to this stagnation. First, there has been a noticeable lack of student interest in inspection programs, as evidenced by the complete collapse of the coordinate metrology program. This situation indicates a need for more targeted outreach and perhaps a reevaluation of how we market these specialized programs.

Secondly, the anticipated growth of the nanotechnology and microelectromechanical systems (MEMS) sectors in our region did not materialize as optimistically predicted. As such, we have not yet implemented a comprehensive program in these areas. Future efforts will need to include a market analysis to assess potential interest and industry demand more accurately.

The course redesign initiative is partially completed, with significant strides made toward streamlining the curriculum. A notable achievement has been the substantial reduction in the total units required to obtain certificates and fulfill major requirements for the Associate of Arts (AA) degree. Additionally, we have successfully implemented a predictable two-year class schedule, enabling students to complete all certificates within that timeframe.

The consolidation of the Plastics Manufacturing Technology (PMT) program into ENGT has also been completed, allowing for a more cohesive educational experience. As we continue through the current curriculum review cycle, we are focused on further developing fully stackable and foldable certificates and AA degrees that align with student and industry needs. While the course redesign is not fully complete, we expect to finalize it over the next six years.

The pandemic presented a challenge to student enrollment, particularly in the ENGT program, as many students were redirected to the more theoretical ENGR pathways. In response, we are actively strategizing to increase enrollment through enhanced outreach initiatives. Our focus will be on promoting the hands-on, practical aspects of the ENGT program, aiming to attract a diverse student population from local high schools.

The sustainability of the Fab Lab (Previously ME-1 the lab of Plastics Department) and its associated activities has been a critical goal. We have successfully maintained the lab's operational status and are exploring additional funding opportunities to support its ongoing activities. The integration of student competitions within the Fab Lab framework has fostered a sense of community and practical application of skills learned in the classroom.

In summary, while the last review cycle presented considerable challenges, particularly due to the COVID-19 pandemic and the redirection of students to the ENGR program, the ENGT program is on a path to revitalization. The successful completion of partial computer upgrades and the acquisition of new equipment have set a strong foundation for future growth. As we look to the next six years, our commitment to enhancing the curriculum, increasing enrollment, and developing new programs will be pivotal in establishing the ENGT program as a leader in engineering design technology education.

6. If applicable, describe the resources the program received from the last review cycle and the impact it had on the program?

The resources allocated during the last review cycle played a pivotal role in enhancing the educational experience for both faculty and students. Among the most significant contributions were the upgrades to computer systems and the acquisition of advanced 3D printing equipment.

The computer upgrade was absolutely necessary for the program's continued viability. With the rapid advancement of software technology, including newer versions of SolidWorks and Autodesk products, the existing single-screen computers were inadequate. Without these upgrades, the ability to run essential software would have been severely compromised, potentially leading to a halt in classroom activities and project work. The upgraded dual-screen workstations will not only enhance the learning experience but also prepare students for industry standards where advanced software capabilities are a must. The computer upgrades in the ideal world should be held every 2 years, however, if they are delayed for more than 4 years, the

new version of CAD software will not function, and the program will face work stop situation. We hope to do at least two cycle of computer upgrades during the next review period. The purchase of 3D printing equipment, particularly the BigRep and FormLabs printers, was key to the survival and revitalization of interest in the Fab Lab and associated classes. The presence of the BigRep printer has already had a remarkable impact; it has attracted many students including several University of California senior students to enroll in the current semester's ENGT251 Composites Fabrication class in order to learn use of the system and to produce the parts for their students competition. This has lead to about 50% increase in enrolment compared with previous class offering. Notably, these students are regular UCI seniors who come to Cerritos College to collaborate on building a solar car for student competition. This partnership exemplifies the unique opportunities our Fab Lab provides and highlights the importance of our facilities in facilitating real-world projects. Moreover, the enhanced 3D printing and fabrication capabilities enabled by these resources were instrumental in the success of the Cerritos College Robotics team. Competing effectively in robotics would have been nearly impossible without access to the updated technology and equipment. The resources provided in the previous cycle have empowered students to innovate, experiment, and ultimately excel in their projects, thereby enhancing their learning experience and fostering a spirit of collaboration. Furthermore the architecture students, under the new faculty will start utilizing same large scale 3d printing capabilities in order to print architecture models. In the next cycle, it is crucial to sustain operational status of the FabLab, by providing maintenance fee resources, and by upgrading SLA FormLabs systems, and upgrading other 3d printers to the new standards as they come to the obsolescence. We will also need funding for the continuous supply of materials and supplies.

The ENGT faculty and students express profound gratitude to the state and federal funding agencies, as well as to the school management, for their investment in these crucial resources. These contributions have been put to excellent use, directly benefiting our students and supporting our mission to train a high-tech workforce that meets the needs of local employers, and resulted in an increase of enrollment, collaboration with the UCI, and increased in the SLO's performance for the composites fabrication class . As we move forward, we remain committed to maximizing the use of these resources to enhance our curriculum, engage our students, and strengthen partnerships with local industry. The support we have received has laid a solid foundation for future growth and innovation, ensuring that the ENGT program remains at the forefront of engineering design technology education.

In conclusion, the resources allocated during the last review cycle were not merely beneficial; they were essential for the survival and revitalization of the ENGT program and the Fab Lab. The upgrades to technology and equipment have not only improved our operational capabilities but have also fostered a renewed interest in hands-on learning among our students. As we look to the future, we are optimistic about continuing to build on this momentum, ensuring that our program meets the demands of an evolving industry and contributes meaningfully to the local economy.

Section 5. Program Goals and Resource Requests

A. Six-Year Program Goals and Resource Requests