YEARLY PLANNING DISCUSSION TEMPLATE
General Questions

Program Name __ENGINEERING_____Academic Year ___2024-25____

1. Has your program mission or primary function changed in the last year?

No. The mission and function remain the same.

Program Mission Statement
The educational mission of the AHC Engineering Program is as follows:

1. To prepare students to transfer to, and succeed at, a four-year undergraduate engineering program.
2. To provide courses that enable students to complete lower division engineering requirements for transfer to a four-year university, and/or to complete an Associate Degree in Engineering.

The program seeks to produce transfer-ready students who are technically competent in sophomore level engineering subjects, who can communicate and work effectively in diverse teams, and who are responsible citizens. The program also seeks to promote student interaction with faculty, industry, student organizations and professional societies.

The Engineering Program at AHC produces graduates/transfer students who:

1. will succeed academically in, and graduate from, a four-year engineering program;
2. can apply the fundamental principles of mathematics, science, and engineering to solve basic engineering and scientific problems;
3. can work effectively as individuals and in diverse teams;
4. are effective communicators;
5. conduct themselves ethically and professionally, and exhibit personal integrity and responsibility in their actions;
6. continue to engage in life-long learning, including professional, academic and personal development.

The program directly supports the AHC mission of providing "quality educational opportunities that enhance student learning and the creative, intellectual, cultural, and economic vitality of our diverse community."

Program Description
The associate degree in engineering provides lower-division coursework that can serve as the basis for a bachelor's degree offered by a four-year college or university. Students who intend to transfer should check the lower-division requirements in the catalog of the college or university to which they intend to transfer, create a Student Educational Plan with an academic counselor, visit www.assist.org, and consult the engineering faculty. The engineering program provides a general background suitable for a variety of engineering fields including mechanical, civil, aerospace, electrical, computer and biomedical engineering.

2. Were there any noteworthy changes to the program over the past year? (eg, new courses, degrees, certificates, articulation agreements)

No noteworthy changes.

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3. Is your two-year program map in place and were there any challenges maintaining the planned schedule?

Yes.
Please see https://www.hancockcollege.edu/pathways/sciences-technologies/engineering.php

There is a 2-year map for the local Associate of Arts degree in Engineering.

However, engineering is a high-unit major, so there is no AST/ADT degree in the state. Many engineering students require more than two years of work to complete all the STEM courses required to transfer. In addition, some must take courses such a MATH 141 (Precalculus), CHEM 120 (Introductory Chemistry) and PHYS 110 (Introductory Physics), to meet the prerequisites of MATH 181 (Calculus 1), CHEM 150 (General Chemistry), and PHYS 161 (Engineering Physics 1). Thus, we (Christine Reed and Angelica Eulloqui, AHC STEM Counselors, with input from Dom Dal Bello, Engineering Professor), have created fourteen 3-year program maps for "Engineering for Transfer".

The fourteen 3-year program maps for "Engineering for Transfer" are:

1. Aerospace Engineering
2. Architectural Engineering
3. Biomedical Engineering
4. BioResource and Agricultural Engineering
5. Chemical Engineering
6. Civil Engineering
7. Computer Engineering
8. Electrical Engineering
9. Environmental Engineering
10. Industrial Engineering
11. Manufacturing Engineering
12. Materials Engineering
13. Mechanical Engineering
14. Software Engineering

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4. Were there any staffing changes?

No.

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5. What were your program successes in your area of focus last year?

2023-24 Focus: Innovative Scheduling

From last year's focus:

> **3. What are your plans for change or innovation?**
>
> a. Course conflicts.
>
> As noted above, the course offerings are fairly locked in their place. Engineering is committed to continue working with other disciplines, especially in STEM, to reduce course conflicts. These disciplines include, but are not limited to, Chemistry, Computer Science, Geology and Physics.
>
> b. Expand Math offerings
>
> Work with the Math program and administration to consider offering MATH 182 online at least one fall-spring semester, and explore a F2F Math 183 in the summer.
>
> c. ENGR 100
>
> Expand ENGR 100 to at least two units (e.g., add 3 lab hours, or create a new course, ENGR 101), in line with other community colleges and matching the 2-unit minimum C-ID for Introduction to Engineering. Creating this course was actually a plan from last years' Focus: Curriculum and Teach Design.
>
> However, expanding hours would also mean determining how to fit this new lab experience into the existing college-wide schedule. By beefing up ENGR 100, more students may be motivated to stick with engineering, which will increase enrollments in the advanced engineering courses.

The 2023-2024 Innovative Scheduling planning initiative (one) was:

> An ENGR 101 Intro to Engineering and Design (working title) is to be created. This course could be a 1-unit course to complement ENGR 100, or a 2-unit course that would include ENGR 100 material. The 2-unit experience (ENGR 100 + ENGR 101, or an equivalent 2-unit course) would match the C-ID descriptor for Introduction to Engineering.

Through December 2024:

- **3a Course Conflicts**: The Engineering Program continues to work with department chairs and disciplines within Mathematical Sciences and Life & Physical Science to minimize scheduling conflicts. Physics 162 and 163 are the primary STEM courses for Engineering to avoid conflict with, along with Math 183 and 184 (which are never scheduled against and Engineering course), followed by Chemistry 15x/18x. Engineering Technology is a discipline to connect with, as Tu/Th evening drafting courses may conflict with Engineering courses when the Engineering Programs moves to a year of evening offerings (every other year – Odd Fall, Even Springs – Engineering offers Tu/Th evening sophomore-level courses).

- **3b Expand Math Offerings**: Not yet attempted.

- **3c Planning Initiative – "ENGR 101"**
  In Fall 2024, a Course Outline of Record was begun, along with another previously identified course: ENGR 122 - Programming and Problem-Solving in MATLAB. Time limitations limited new course proposals in Fall 2024 to the MATLAB Course.

Learning Outcomes Assessment

The PLOs for Engineering were modelled after the Outcomes for the Accreditation Board for Engineering and Technology (ABET). The AHC ENGR PLOs

ENGR1- Apply fundamental concepts of mathematics (through calculus), science and engineering.
ENGR2- Communicate effectively both orally and in writing, using symbols, graphics and numbers.
ENGR3- Conduct experiments and analyze and interpret data.
ENGR4- Function professionally and ethically as an individual and within diverse teams.
ENGR5- Identify, formulate and solve basic engineering problems.
ENGR6- Make basic design decisions concerning appropriate-level engineering problems.
ENGR7- Recognize the need for, and an ability to engage in, lifelong learning.
ENGR8- Use techniques, skills and modern engineering tools necessary in engineering education and practice.

a. Please summarize key results from this year's assessment.

Assessment of Learning Outcomes focused on ENGR 100 Statics. For PLO 7:ENGR7 Recognize the need for, and an ability to engage in, lifelong learning. The assessment found that 79.3% met the standard, above the "standard" of 70%.

b. Please summarize your reflections, analysis, and interpretation of the learning outcome assessment and data.

A "score" of 79% is not bad, but there definitely room for improvement. A more specific question on this PLO could be asked, along with a focused learning module.

c. Please summarize recommendations and/or accolades that were made within the program/department.

N/A

d. Please review and attach any ***changes*** to planning documentation, including PLO rubrics, associations, and cycles planning.

While the PLOs are solid, some time should be spent during 2025-2026 reevaluating the PLOs, with a goal of reducing their number. This can be done by identifying overlaps/commonalities which allow PLOs to be combined or eliminated. Having many PLOs, along with a single full-time faculty monitoring 10 courses means some PLOs will not get assessed.

Distance Education (DE) Modality Course Design Peer Review Update (Please attach documentation extracted from the *Rubric for Assessing Regular and Substantive Interaction in Distance Education Courses*)

N/A – Engineering has no DE offerings.

a. Which courses were reviewed for regular and substantive interactions (RSI)?

b. What were some key findings regarding RSI?
   - Some strengths:
   - Some areas of possible improvement:

c. What is the plan for improvement?

CTE two-year review of labor market data and pre-requisite review

N/A. Engineering is not classified as a CTE program.

a. Does the program meet documented labor market demand?
b. How does the program address needs that are not met by similar programs?
c. Does the employment, completion, and success data of students indicate program effectiveness and vitality? Please, explain.
d. Has the program met the Title 5 requirements to review course prerequisites, and advisories within the prescribed cycle of every 2 year for CTE programs and every 5 years for all others?
e. Have recommendations from the previous report been addressed?

Use the tables below to fill in **NEW** resources and planning initiatives that **do not apply directly to core topics.** ***This section is only used if there are new planning initiatives and resources requested.***

Sample:

New Program Planning Initiative (Objective) – Yearly Planning Only	
Title (including number:	*ER Obj-2 Video Speeches for Student Learning and enhancement*
Planning years:	*(The academic years this will take to complete)* 2021-22 to 2024-25
Description: *(A more detailed version of initiative. Please include a description of the initiative, why it is needed, who will be responsible, and actions that need to happen, so it is completed.)* The success levels of our courses have indicated that students need to be able to review their own speeches. Videotaping the student's speech provides a very constructive approach to review and improve their oratory skills.	
What college plans are associated with this Objective? (Please select from the list below): ☐ **Ed Master Plan** ☐ **Student Equity Plan** ☐ **Guided Pathways** ☐ **AB 705** ☐ **Technology Plan** ☒ **Facilities Plan** ☐ **Strong Workforce** ☐ **Equal Employment Opp.** ☐ **Title V**	

Resource Requests: Please use the Resource Request Excel template located on the Program Review web page to enter resource requests for equipment, supplies, staffing, facilities, and misc. resources needed. Send completed excel document along with completed program view core topic for signature.

New Program Planning Initiative (Objective) – Yearly Planning Only	
Title (including number:	1. Grips for wide tensile specimen
Planning years:	*2024-2025*

The Instron Tensile tester in the Engineering Lab has grips that can clamp thin specimens, but not wide specimens. It is desirable to test wide specimens to student the effects of larger areas, as well as the failure mechanisms of bolted joints. These cannot currently be studied with the equipment on hand.

Estimated cost ~ $12,000

Ed Master Plan:
E.2 Invest in cutting-edge relevant industry technology to prepare students for the workforce.
C.5 Ensure existing classroom and campus spaces encourage student engagement and reflects multicultural and multi-ethnic backgrounds.

What college plans are associated with this Objective? (Please select from the list below):

[X] **Ed Master Plan** [ ] **Student Equity Plan** [ ] **Guided Pathways** [ ] **AB 705/1705**

[ ] **Technology Plan** [ ] **Facilities Plan** [ ] **Strong Workforce** [ ] **Equal Employment Opp.**

[ ] **Title V**

New Program Planning Initiative (Objective) – Yearly Planning Only	
Title (including number:	2. MATLAB ONLINE Licenses
Planning years:	*2024-2025, ongoing*

Description:

Ongoing request.

ENGR 126 MATLAB for Science and Engineering, uses MATLAB, by the MathWorks (mathworks.com). The campus uses MATLAB Online licenses, 50 seats. Current is 40 seats.

Estimated cost for 50 seats @$46/seats per year: $2,300/yr, ongoing.

Ed Master Plan:
E.2 Invest in cutting-edge relevant industry technology to prepare students for the workforce.
C.5 Ensure existing classroom and campus spaces encourage student engagement and reflects multicultural and multi-ethnic backgrounds.

What college plans are associated with this Objective? (Please select from the list below):

[X] **Ed Master Plan** [ ] **Student Equity Plan** [ ] **Guided Pathways** [ ] **AB 705/1705**

[ ] **Technology Plan** [ ] **Facilities Plan** [ ] **Strong Workforce** [ ] **Equal Employment Opp.**

[ ] **Title V**

Area of Focus Discussion Template
ENROLLMENT TRENDS AND EFFICIENCY

Enrollment Trends and Efficiency – look for areas of growth or decline, relationship to the college and similar programs, and head count (enrollment and full-time equivalents for students and full-time equivalents faculty). Sample activities include the following:

Possible topics:

- Review FTES, headcount and enrollment trends disaggregated by population groups.
- Assess trends in productivity.
- Review retention and success rates by modality and disaggregated by population groups.
- Analyze the throughput of students from every completion and assess time to completion and disproportionate impact.
- Collaborate with guided pathways success teams to determine if programmatic barriers exist.
- Establish program goals for success rates.

1. What data were analyzed and what were the main conclusions?

A. Credit Enrollment/Headcount/Credit Engineering vs AHC (Credit), AY 2019-20 through AY 2023-24
B. Enrollment by Course, AY 2019-20 through AY 2023-24
C. Headcount, by Ethnicity (simple) vs AHC, AY 2019-20 through AY 2023-24
D. Headcount, by Gender vs AHC, AY 2019-20 through AY 2023-24
E. FTES/FTEF/Efficiency, Engineering vs. AHC, AY 2019-20 through AY 2023-24
F. Fill Rate, Engineering vs. AHC, AY 2019-20 through AY 2023-24
G. Success and Retention, AY 2019-20 through AY 2023-24
H. Success and Retention by Ethnicity (simple), AY 2019-20 through AY 2023-24
I. Success and Retention by Gender, AY 2019-20 through AY 2023-24

Please see data provided by Institutional Effectiveness after the signature page, in *Figures A1, A2, A3…* .

Engineering data should be analyzed with the following caveats/considerations:

- The number of students in engineering courses is very small relative to AHC (e.g., Credit FTES: 26.3 vs. 7,624, or about 0.34%). Small absolute changes in the engineering courses (compared to AHC college-wide) can lead to large percentage changes in the program.
- Engineering-pathway students provide most of the enrollment for Math 181-184 and Physics 161-163, and significant enrollment in Chemistry 150/151.
- The number of female engineering students is small. Of the five sophomore-level lecture courses (Engr. 152, 154, 156, 161, 170), there were 76 female enrollments over five years or 25 sections (2019-20 through 2023-24), an average of 3 students per class. Three sections had zero female students. Such small female engineering cohorts make data analysis difficult (e.g., one of two students not succeeding reduces success from 100% to 50%), but more importantly, small cohorts can make it more challenging for female students to persevere.

- The number of white engineering students is also small. In the five sophomore-level lecture courses over the past five years (2019-20 through 2023-24), 90 were classified as white, less than 4 per section.
- The engineering student population is of two types. Engr 100 *Introduction to Engineering* has no prerequisites, and is primarily composed of first-year students exploring possible pathways; many are just starting to transition into their more self-directed and disciplined selves. Engr 152 and above are the sophomore-level courses, taken the year before transfer. These students have passed at least Math 182 and Physics 161, and have in some ways been "filtered" and toughened. Engr 170 *Electric Circuit Analysis* has a prerequisite of Physics 163 and Math 184 (the latter may be concurrent). Engr. 124 and 126 each have a prerequisite of Math 181.

A. Credit Enrollment/Headcount/Credit Engineering vs AHC (Credit), AY 2019-20 through AY 2023-24 (*Figure A1a, A1b*)

Summary/Conclusions

Due to COVID-19, Credit Enrollment, Headcount and FTES values decreased at AHC (college-wide) and in Engineering (program), most categories bottoming out in 2021-22. Engineering *Enrollment* and *FTES* were minimum in 2022-23, which can be accounted for by the fact that Engineering is very pre-requisite dependent, so enrollment decreases seen college-wide can be delayed at the program-level.

Table 1 compares 2019-20 (pre-COVID) and 2023-24 Credit Enrollment, Headcount and FTES. Engineering program Credit Enrollment/Headcount/FTES is generally up while college values are down. The small-numbers issue is illustrated as follows: if 2023-24 Engineering headcount was 30 less (one ENGR 100 section), headcount would be 160, or a 10.8% reduction. It is for this reason that strong personal connections between faculty/staff and students in critical.

Table 1 Credit Enrollment/Headcount/FTES, AY 2019-20 through AY 2023-23

Category	2019-20	2023-24	Percent Change
ENGR Enrollment	322	339	+5.3%
ENGR Headcount	179	190	+6.1%
ENGR FTES	24.8	26.3	+6.0%
AHC Enrollment	65,970	60,425	–8.4%
AHC Headcount	17,050	16,226	–4.8%
AHC FTES	8,353	7,625	–8.7%

B. Enrollment by Course, AY 2019-20 through AY 2023-24 (*Figure A2*)

Summary/Conclusions

The drop in enrollment in each course is readily seen in 2021-22 and 2022-23 (*Figure A2*), with a rebound in 2023-24. Enrollment data for each course from 2019-2029 (pre-COVID) and 2023-24, and 2024-25 (projected) are shown in *Table 2*.

Table 2 Engineering Course Enrollment, 2019-20; 2023-24; and 2024-25.

Course	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25*
100 Intro	113	107	82	93	120	96
124 Excel	21	24	10	13	21	7
126 MATLAB	26	29	16	17	19	27
152 Statics	31	29	25	16	31	27
154 Dynamics	14	25	10	12	18	19
156 Strength of Materials	11	18	12	12	22	23
161 Materials Science	29	25	25	19	29	18
162 Material Science Lab	29	23	21	15	25	15
170 Electric Circuits	24	22	15	15	27	33
171 Electric Circuits Lab	24	19	16	14	27	33
Total	**322**	**321**	**232**	**226**	**339**	**298**

*Data from 2024-2025 Argos Reports, as of Dec. 26, 2024.

C. Headcount, by Ethnicity (simple) vs AHC, AY 2019-20 through AY 2023-24 (*Figures A3a, A3b*)

C. Summary/Conclusions

Hispanics headcount (percentage) in engineering is greater than that of the college overall (equal in 2020-21), as show in *Table 3*. This has been a general observation for the last two decades. The Engineering Program is thus representative of the college Hispanic demographic.

Table 3 Hispanic Headcount, by percent

Year	Engineering	AHC
2019-20	78%	60%
2020-21	64%	64%
2021-22	77%	66%
2022-23	73%	68%
2023-24	71%	70%

D. Headcount, by Gender vs AHC, AY 2019-20 through AY 2023-24 (*Figures A4a, A4b*)

Summary/Conclusions

Female headcount in Engineering is typically less than 20% (*Table 4*), while college female headcount is no less than 53% (2019-20 through 2023-24). This gap is not atypical. In the United States, the undergraduate Fall 2023 female enrollment at 4-year universities is 24.6% *(Engineering & Engineering Technology By the Numbers*, American Society for Engineering Education, 2024). The nationally-observed female-to-male ratio is potentially magnified locally at AHC due to the large Hispanic population, where females are historically not as supported as their male counterparts in pursuing engineering-related fields.

One challenge with the data analysis is that the number of female students is so small that data is statistically insignificant, and subject to large percentage swings. With three (3) female students per sophomore-level engineering class per year, a non-successful grade changes success rates by 33%. Additionally, a relatively large change in female headcount does not necessarily affect overall percentages. For example, from 2022-23 to 2023-24, female headcount increased by about 10% (31 to 34 students), but overall female representation decreased by 18% with respect the base (22% female to 18% female).

The small number of female students has additional effects – fewer female students may be encouraged to enroll, or continue to enroll (persevere), due to less sense of belonging compared to their male counterparts. That being said, female students often perform just as well, if not better, that the average and median male students. The top student in Engr 152 and 161 in Fall 2023 was female; a female student finished in the top three in those courses in Fall 2024.

Table 4 Female Headcount (percent)

Year	Engineering	AHC
2019-20	28 (16%)	12,027 (55%)
2020-21	23 (13%)	9,688 (57%)
2021-22	18 (14%)	10,727 (55%)
2022-23	31 (22%)	10,390 (53%)
2023-24	34 (18%)	10,740 (53%)

E. FTES/FTEF/Efficiency, Engineering vs. AHC, AY 2019-20 through AY 2023-24 (*Figure A5*)

Summary/Conclusions

The 2023-24 Efficiency values are: AHC Engineering: 11.7; AHC overall: 12.7. Engineering tends to have lower efficiency than the average AHC course. This is due to the lengthy prerequisite chain of courses, resulting in smaller-than-average course sizes. On the other hand, the existence of the engineering program provides significant enrollment in those pre-requisite courses (e.g., Math 181-184, Physics 161-163, Chem 150, etc.).

F. Fill Rate, Engineering vs. AHC, AY 2019-20 through AY 2023-24 (*Figure A6*)

Summary/Conclusions

Although Fill Rate can vary quite a bit – especially in courses towards the end of a pre-requisite change – Engineering is on par with the fill rate of the AHC overall (*Table 5*).

Table 5 Fill Rate (percent)

Category	Engineering	AHC	w.r.t. AHC
2019-20	81%	78%	+3%
2020-21	82%	78%	+4%
2021-22	64%	70%	–6%
2022-23	68%	74%	–6%
2023-24	91%	77%	+14%

G. Success and Retention, AY 2019-20 through AY 2023-24 (*Figure A7*)

Summary/Conclusions

The Success and Retention rates for AHC and Engineering courses are shown in *Table 6*. Except for 2021-22 and 2022-23, Engineering Program data is better than college-wide data. Academic Years 2021-22 and 2022-23 followed COVID, so we pose that may be the reason subpar results in Engineering, a discipline heavily dependent on mathematical principals.

It may be observed that Engr 100 *Introduction to Engineering* tends to (but not always) have lower retention and success rates than the "harder" sophomore-level courses towards the bottom (Engr 15x, 16x and 17x). This is especially apparent in 2023-2024. As noted earlier, Engr 100 has no prerequisites, and is primarily composed of first-year students exploring possible pathways; many are just starting to transition into their more self-directed and disciplined selves. Engr 152 and above are the sophomore-level courses, taken the year before transfer. These students have passed at least Math 182 and Physics 161; they are "survivors", and motivated, and therefore do not hesitate to put in effort.

Table 6 Success and Retention Rates, AHC and Engineering. Underline: 3% over college rate; **Bold**: 3% under.

Course	2019-20	2020-21	2021-22	2022-23	2023-24
AHC Overall	72% / 82%	74% / 88%	71% / 86%	72% / 87%	74% / 89%
Total Engineering	76% / 84%	78% / 90%	**64% / 80%**	**67% / 82**%	75% / 92%
100 Intro to Engineering	75% / 86%	72% / 87%	**57% / 79%**	73% / 87%	**58%** / 88%
124 Excel	71% / 81%	83% / 92%	70% / **80**%	**46% / 62%**	86% / 90%
126 MATLAB	**65% / 65%**	**69%** / 86%	69% / 94%	76% / 94%	**68% / 84%**
152 Statics	71% / 81%	79% / 89%	**48% / 64%**	**56% / 81%**	74% / 90%
154 Dynamics	**64% / 64%**	**68%** / 92%	70% / 90%	**58% / 83%**	78% / 100%
156 Strength of Materials	82% / 82%	78% / 94%	**58% / 75%**	**58% / 83%**	73% / 91%
161 Materials Science	79% / 90%	84% / 92%	**52% / 72%**	**53% / 74%**	86% / 97%
162 Material Science Lab	90% / 90%	87% / 87%	71% / **76%**	**67% / 73%**	100% / 100%
170 Electric Circuits	79% / 79%	86% / 96%	93% / 93%	73% / **80%**	93% / 96%
171 Electric Circuits Lab	88% / 88%	95% / 100%	94% / 94%	79% / **79%**	93% / 93%

H. Success and Retention by Ethnicity (simple), AY 2019-20 through AY 2023-24 (*Figure A8*)

Summary/Conclusions

The success rates for Hispanic and White students are shown in *Table 7*, using the simple ethnicity categories from Institutional Effectiveness data. The "Other" demographic category is not included for simplicity (although in some cases, it is equal or greater in number to the White demographic). All years show greater success for White students compared to Hispanic students, with the gap for the first three years being equal or greater for engineering courses than for college courses in general. However, for 2022-23, the gap for engineering courses is less than the college gap. And, in 2023-24, the success rate for Hispanic students in Engineering courses exceeded that of white students by 9%.

Table 7 Success Rate, Hispanic vs. White (percent), Gap

Years	Engineering Hispanic/White/Gap	AHC Hispanic/White/Gap
2019-20	73% / 85% / –12%	69% / 79% / –12%
2020-21	71% / 85% / –14%	72% / 79% / –7%
2021-22	59% / 79% / –20%	69% / 77% / –8%
2022-23	65% / 68% / –3%	70% / 77% / –7%
2023-24	74% / 65% / +9%	71% / 81% / –10%

Instead of comparing Engineering against AHC overall, a more appropriate analysis includes identifying disproportional impact (D.I.) within engineering courses. Over the past five years, the 13 engineering sections (Engr. 100 actually has 3-4 section each year) shown in *Table 7* were tagged as having D.I. on the Success and Retention Tableau dashboard provided by AHC's Institutional Effectiveness dashboard. Again, the "Other" demographic is not included in the table.

Table 8 Success-D.I.-marked courses 2019-2022 through 2023-24, Success Rate, Hispanic vs. White (percent), Gap

Course, Year	D.I. Cohort	Hispanic	White	Note
Engr 100, 2019-20	Hispanic	73% (*n*=89)	86% (*n*=14)	Hispanic:White numbers: 5.9:1
Engr 100, 2020-21	Hispanic	66% (*n*=65)	73% (*n*=22)	H:W numbers: 3.0:1
Engr 100, 2021-22	Hispanic	52% (*n*=62)	75% (*n*=12)	H:W numbers: 5.2:1
Engr 100, 2023-24	Hispanic	51% (*n*=86)	68% (*n*=25)	H:W numbers: 3.4:1
Engr 126, 2019-20	Hispanic	58% (*n*=19)	100% (*n*=5)	White $n \leq 5$
Engr 126, 2020-21	Hispanic	61% (*n*=23)	100% (*n*=2)	White $n \leq 2$
Engr 126, 2021-22	Hispanic	67% (*n*=15)	100% (*n*=1)	White $n \leq 2$
Engr 126, 2022-23	Hispanic	73% (*n*=15)	100% (*n*=1)	White $n \leq 2$
Engr 152, 2021-22	Hispanic	43% (*n*=21)	50% (*n*=2)	White $n \leq 2$
Engr 156, 2021-22	Hispanic	55% (*n*=11)	100% (*n*=1)	White $n \leq 2$
Engr 161, 2020-21	Hispanic	73% (*n*=15)	100% (*n*=8)	White $n \leq 10$
Engr 170, 2019-20	Hispanic	72% (*n*=18)	100% (*n*=4)	White $n \leq 5$
Engr 170, 2020-21	Hispanic	73% (*n*=11)	100% (*n*=9)	White $n \leq 10$

Note: For some reason, a 14th section, Engr 162, 23-24 was tagged D.I., but the Hispanic students had 100% success rate (?).

It should be noted that 8 of 13 sections tagged at D.I. are Engr 100 *Introduction to Engineering* and Engr 126 MATLAB; both are one-unit courses and are not critical to transfer. Seven sections have *n*-values for White students of $n = 5$ or less, and five sections of $n = 2$ or less. One additional White non-success (or two) may have removed the D.I.-tag; and if *n*-values matched, a better comparison might be had. The *n*-values are only close in ENGR 170, 2020-21 (11:9, offered during the second full-semester of COVID), and arguably in ENGR 161, 2020-21 (15:8, offered during the first full-semester of COVID).

Engr 126 is a P/NP class, which requires consistent work throughout the semester. Work can often be put off if students have life-priorities that overtake them, so they may end up with an NP. Engr 100 also requires consistent work each week, often easy to put off. Engr 100 is in ways a personal development course for engineering majors, and hopefully a key transition point from a high school to a college mindset. Fall 2024, the Engr 100 instructor observed that while students were attending class (there is a participation grade), many of attendees were not turning homework in in a timely fashion; this seems to have increased compared to pre-COVID days.

That being said, one way address these discrepancies is to utilize more group-work in assessments, as well as to increase outreach to students who are not turning in homework or who are in danger of not passing.

Table 8 drills further down the success-rate data by Ethnicity (simple): Hispanic, Other, White. The D.I.-marked course are indicated with orange highlight. Again, the low *n*-values are problematic. One more non-success in Other/White in Engr 152, 2021 would have removed the D.I.-marking.

Of the 25 sophomore-level engineering sections from 2019-20 through 2023-24 (Engr 152, 154, 156, 161, 170), the "Other" demographic had the highest (or tied with highest) 21 times; White 7 times and Hispanic 1 time. Comparing only White to Hispanic categories: 13-10-1, with one section having no White students. This measure leaves a lot to be desired, although it may show trends for further investigation.

Regardless, the faculty will continue to encourage growth and provide a welcoming environment for all students.

Table 8 Success Rates, Hispanic/Other/White; *n*-values, Hispanic/Other/White.
D.I.-marked course are indicated with orange highlight

Course	2019-20	2020-21	2021-22	2022-23	2023-24
100 Intro to Engineering	% = 73/70/86 *n* = 89/10/14	% = 66/90/73 *n* = 65/20/22	% = 52/75/75 *n* = 62/8/12	% = 71/82/79 *n* = 68/11/14	% = 51/100/68 *n* = 86/9/25
124 Excel	% = 69/100/75 *n* = 16/1/4	% = 85/100/67 *n* = 20/1/3	% = 60/100/50 *n* = 5/3/2	% = 50/-0-/50 *n* = 10/1/2	% = 88/67/100 *n* = 16/3/2
126 MATLAB	% = 58/50/100 *n* = 19/2/5	% = 51/100/100 *n* = 23/4/2	% = 67/na/100 15/0/1	% = 73/na/100 *n* = 15/0/2	% = 69/75/50 *n* = 13/4/2
152 Statics	% = 68/100/80 *n* = 25/1/5	% = 72/100/88 *n* = 18/3/8	% = 43/100/50 *n* = 21/2/2	% = 50/100/67 *n* = 12/1/3	% = 71/100/67 24/4/3
154 Dynamics	% = 67/100/33 *n* = 9/2/3	% = 60/100/75 *n* = 15/2/8	% = 67/na/100 *n* = 9/0/1	% = 63/100/33 *n* = 8/1/3	% = 80/100/50 *n* = 15/1/2
156 Strength of Materials	% = 78/100/na *n* = 9/2/0	% = 77/100/75 *n* = 13/1/4	% = 55/na/100 11/0/1	% = 56/100/50 *n* = 9/1/2	% = 72/100/50 *n* = 18/2/2
161 Materials Science	% = 78/100/75 *n* = 23/2/4	% = 73/100/100 *n* = 15/2/8	% = 47/67/67 *n* = 19/3/3	% = 50/67/50 *n* = 14/3/2	% = 87/100/50 *n* = 23/4/2
162 Material Science Lab	% = 87/100/100 *n* = 23/2/4	% = 85/100/88 *n* = 13/2/8	% = 67/67/100 *n* = 15/3/3	% = 64/100/50 *n* = 11/2/2	% = 100/100/100 *n* = 20/4/1
170 Electric Circuits	% = 72/100/100 *n* = 18/2/4	% = 73/100/100 *n* = 9/2/8	% = 91/100/100 *n* = 11/2/2	% = 67/100/75 *n* = 9/2/4	% = 100/100/60 *n* = 18/4/5
171 Electric Circuits Lab	% = 83/100/100 *n* = 18/2/4	% = 89/100/100 *n* = 9/2/8	% = 92/100/100 *n* = 12/2/2	% = 75/100/75 *n* = 8/2/4	% = 100/100/60 *n* = 18/4/5
TOTAL	% = **73/88/85** *n* = **249/26/47**	% = **71/95/85** *n* = **202/39/80**	% = **59/83/79** *n* = **180/23/29**	% = **65/83/68** *n* = **164/24/38**	% = **74/95/65** *n* = **251/39/49**

Note: Engr 162, 23-24 was tagged D.I., but the Hispanic students had 100% success rate (?).

I. Retention/Success by Gender, AY 2019-20 through AY 2023-24 (*Figure A9*)

Table 9 gives the success-rate data by Gender: Female, Male, Non-Binary. Non-Binary data only appears in Engr 100 row.

The D.I.-marked course are indicated with orange highlight in 13 sections. Male students are always the D.I. group. Again, the low *n*-values are problematic. One more non-success in the Female group in any section would eliminate the D.I.-tag.

For what it is worth, of the 50 sections from 2019-20 through 2023-24 (note: Engr 100 had 3-4 sections each year, 162 and 171 had 1-2 sections, but for this analysis are counted as one), Female students had a higher Success Rate 23 times, and Males 22 times, there were two "ties", and in three cases there were no females in the section.

Table 9 Success Rates: Female/Male/Non-Binary, *n*-values. (Non-Binary category is non-zero only in Engr. 100). D.I.-marked course are indicated with orange highlight.

Course	2019-20	2020-21	2021-22	2022-23	2023-24
100 Intro to Engineering	% = 75/76/50 *n* = 20/91/2	% = 76/71/100 17/89/1	% = 47/59/100 15/66/1	% = 77/72/50 22/69/2	% = 58/58/100 19/99/2
124 Excel	% = 100/68 2/19	% = 100/81 3/21	% = -0-/88 2/8	% = 33/50 3/10	% = 100/82 4/17
126 MATLAB	% = 100/61 3/23	% = 50/70 2/27	% = 100/67 1/15	% = 100/73 2/15	% = 60/71 5/14
152 Statics	% = 40/77 5/26	% = 100/77 3/26	% = -0-/50 1/24	% = -0-/69 3/13	% = 63/78 8/23
154 Dynamics	% = 100/58 2/12	% = 100/64 3/22	% = na/70 0/10	% = na/58 0/12	% = 100/71 4/14
156 Strength of Materials	% = 100/78 2/9	% = 100/73 3/15	% = na/58 0/12	% = -0-/64 1/11	% = 80/71 5/17
161 Materials Science	% = 67/83 6/23	% = 100/83 1/24	% = 50/52 2/23	% = 20/64 5/14	% = 100/80 9/20
162 Material Science Lab	% = 83/91 6/23	% = 100/86 1/22	% = 50/74 2/19	% = 50/73 4/11	% = 100/100 8/17
170 Electric Circuits	% = 80/79 5/19	% = 67/89 3/19	% = 100/93 1/14	% = -0-/85 2/13	% = 80/95 5/22
171 Electric Circuits Lab	% = 100/84 5/19	% = 100/94 2/17	% = 100/93 1/15	% = -0-/92 2/12	% = 80/95 5/22
TOTAL	% = **79/76/50** **56/264/2**	% = **87/77/100** **38/282/1**	% = **48/66/100** **25/206/1**	% = **52/71/50** **44/180/2**	% = **78/74/100** **72/265/2**

Note: Engr 162, 23-24 was tagged D.I., but Male students had a 100% success rate (?).

2. Based on the data analysis and looking through a lens of equity, what do you perceive as *challenges* with student success or access in your area of focus?

Challenges include:

- Engr 100 students who may not be traditionally prepared for college work, or not have ready access to computers/Canvas
- Small cohorts of female students, especially in sophomore-level engineering courses.

3. What are your plans for change or *innovation*?

Engr 100

- Reduce size of homework (HW) sets. This has already been incorporated into Fall 2024. As Engr 100 is part personnel development, this was done to allow students to focus on one or two items per week.
- To start to develop weekly HW habits, send out HW reminders at the end of Week 1 and 2 (in addition to the deadline listed in the syllabus and on Canvas).
- Reach out to students early on via email/Canvas if they do not turn in HW #1/#2 so they get into a habit of doing turning in HW each week/starting early, and to ensure they have access to computers/internet/Canvas.
- Notes:
    - Engr 100 HW #1 asks students to read several short sections, and answer two questions: (1) Twenty life goals, and (2) checking off (from a provided table) skills attitudes they make block academic success. Thus the HW is not difficult in nature (it is primarily about themselves).
    - The textbook is loaned to students on the first day, so students have the questions in hand on Day 1.

Female Engineering Students

- Continue to support Women in Engineering Club/program.
- Continue to invite female engineers as speakers to Engr 100.
- Increase number of hands-on in-class and out-of-class projects.
- Connect female student with mentors.
- Hire female students as Embedded Tutors.

4. How will you *measure* the results of your plans to determine if they are successful?

- Analysis of Success and Retention Data.
- Increase in the number of female students in engineering courses.

Validation for Program Planning Process: If you have chosen to do the Validation this year, please explain your process and the findings.

1. Who have you identified to validate your findings? (Could include Guided Pathway Success Teams, Advisory Committee Members, related faculty, industry partners or higher education partners)
2. Are there specific recommendations regarding the core topic responses from the validation team?

No validation team has been identified.

Based on the narratives for the prompts above, what are some program planning initiatives and resources needed for the upcoming years? Use the tables below to fill in **NEW** resources and planning initiatives. ***This section is only used if there are new planning initiatives and resources requested that pertain to the Core Topic only.***

No resources required beyond those that currently exists.

New Program Planning Initiative (Objective) – Core Topic Only	
Title (including number:	
Planning years:	*(The academic years this will take to complete)*
Description: *(A more detailed version of initiative. Please include a description of the initiative, why it is needed, who will be responsible, and actions that need to happen, so it is completed.)*	
What college plans are associated with this Objective? (Please select from the list below): ☐ **Ed Master Plan** ☐ **Student Equity Plan** ☐ **Guided Pathways** ☐ **AB 705/1705** ☐ **Technology Plan** ☐ **Facilities Plan** ☐ **Strong Workforce** ☐ **Equal Employment Opp.** ☐ **Title V**	

Program Review Signature Page:

Dominic Dal Bello (Jun 13, 2025 16:28 PDT)

Program Review Lead | Date

Sean Abel (Jun 13, 2025 16:35 PDT)

Program Dean | Date

Vice President, Academic Affairs | Date

Appendix A: DATA

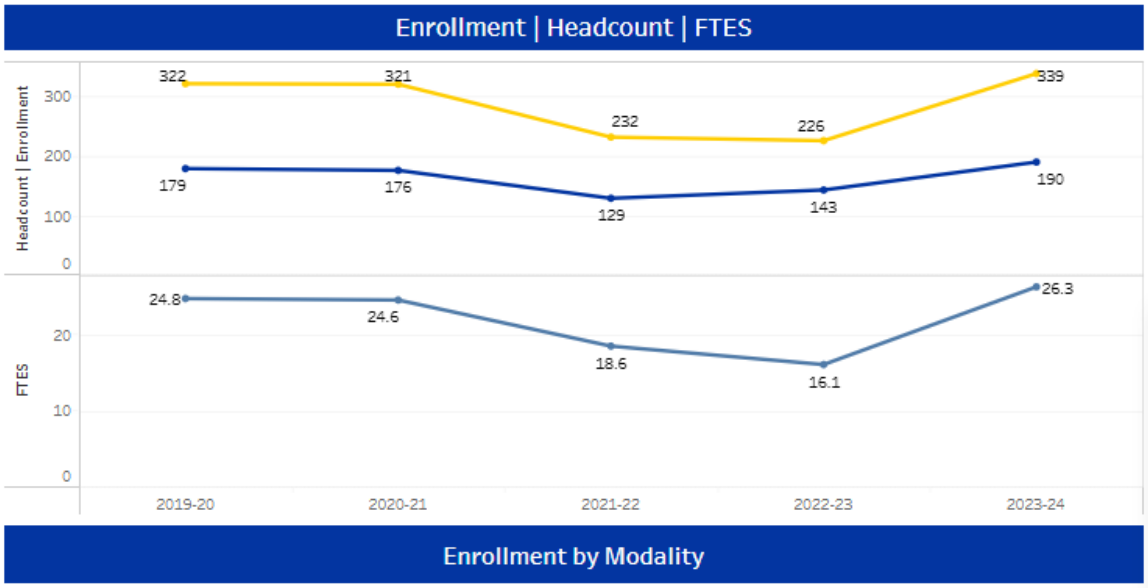


Figure A1a Engineering Enrollment, Headcount/Credit FTES, AY 2019-20 through AY 2023-24.

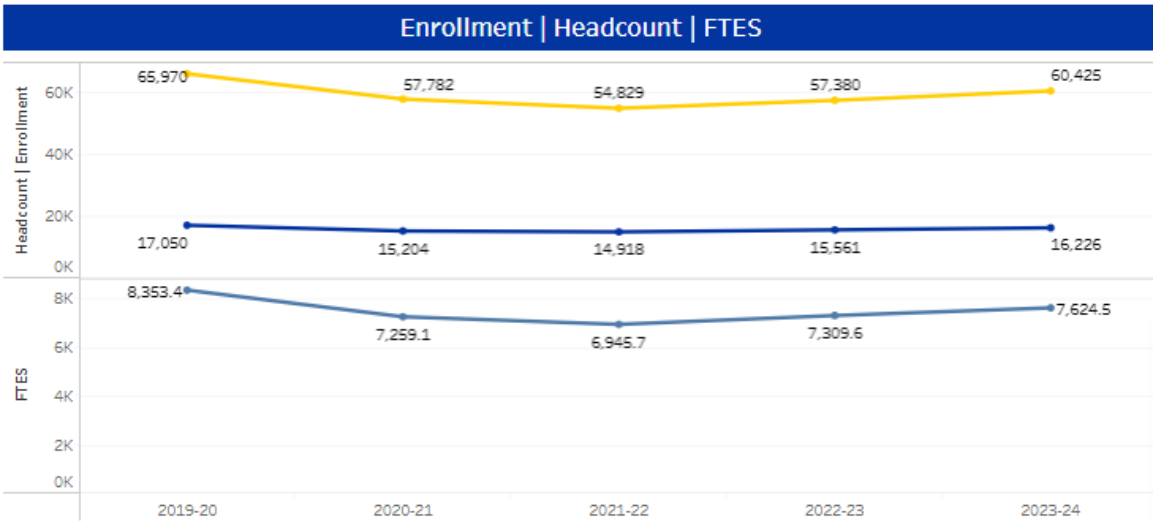
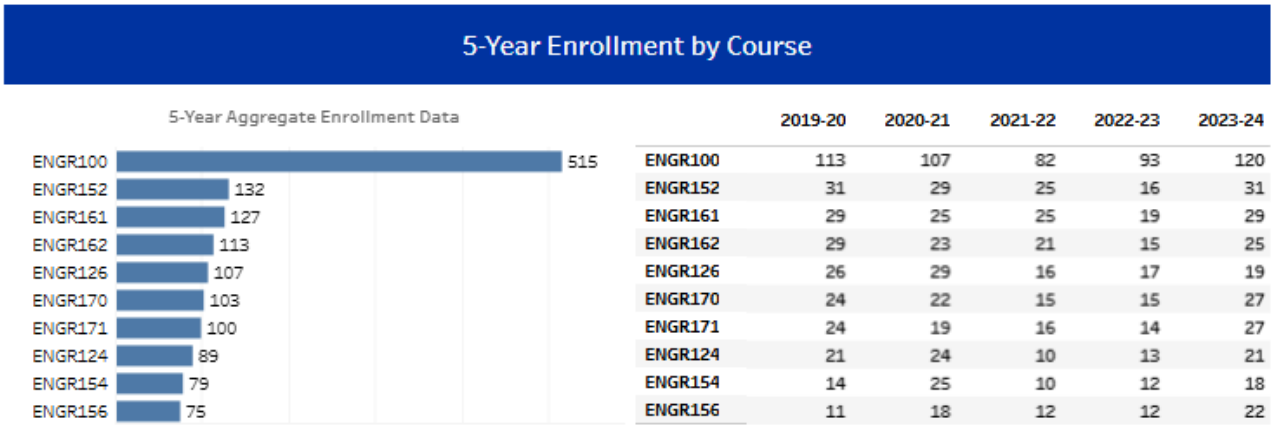


Figure A1b AHC Enrollment, Headcount/Credit FTES, AY 2019-20 through AY 2023-24.



	2019-20	2020-21	2021-22	2022-23	2023-24
ENGR100	113	107	82	93	120
ENGR152	31	29	25	16	31
ENGR161	29	25	25	19	29
ENGR162	29	23	21	15	25
ENGR126	26	29	16	17	19
ENGR170	24	22	15	15	27
ENGR171	24	19	16	14	27
ENGR124	21	24	10	13	21
ENGR154	14	25	10	12	18
ENGR156	11	18	12	12	22

Figure A2 Engineering Enrollment, AY 2019-20 through AY 2023-24.

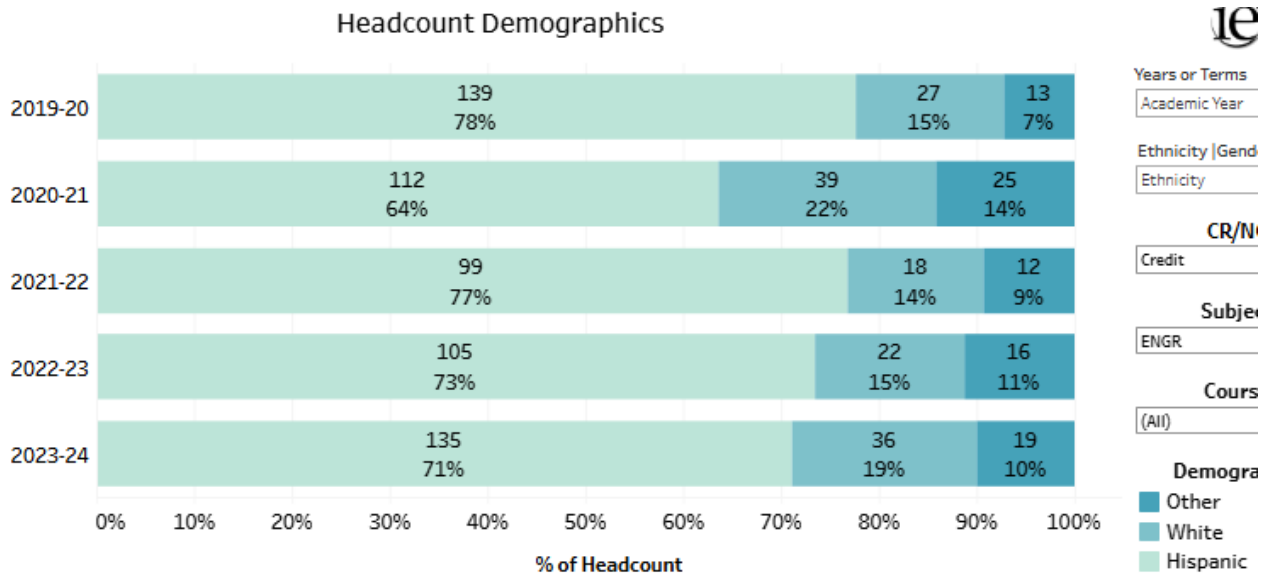


Figure A3a Engineering Headcount, by Race/Ethnicity (simple), AY 2019-20 through AY 2023-24.

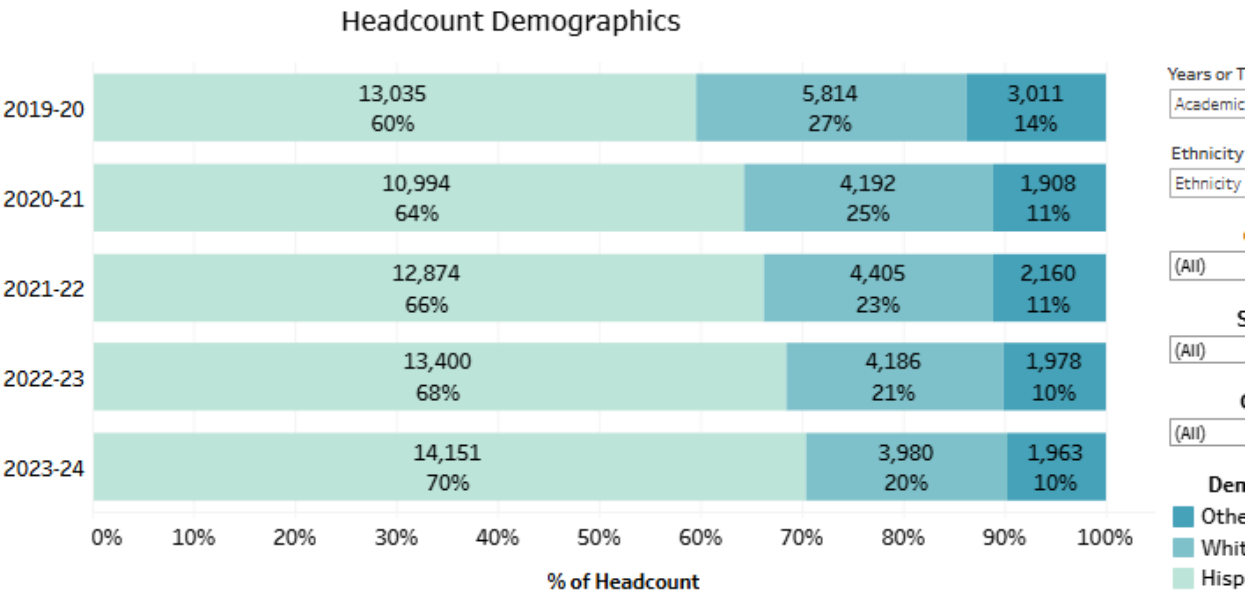


Figure A3b AHC Headcount, by Race/Ethnicity (simple), AY 2019-20 through AY 2023-24.

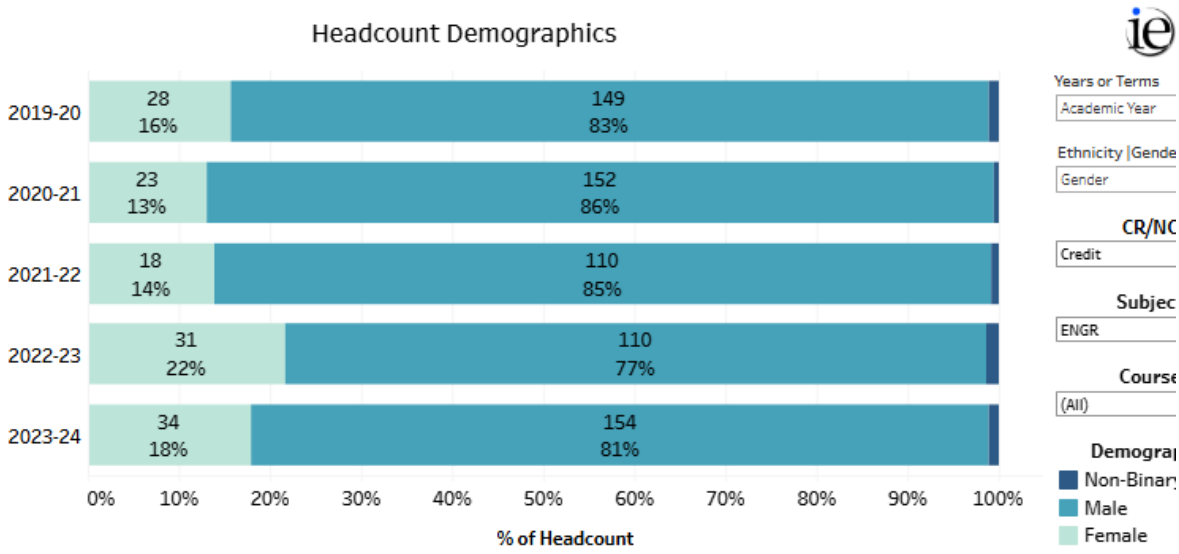


Figure A4a Engineering Enrollment, by Gender, AY 2019-20 through AY 2023-24.

In United States, Undergraduate Fall 2023 Enrollment by Gender: Female: 24.6%; Male: 75.4% (*Engineering & Engineering Technology By the Numbers*, American Society for Engineering Education, 2024).

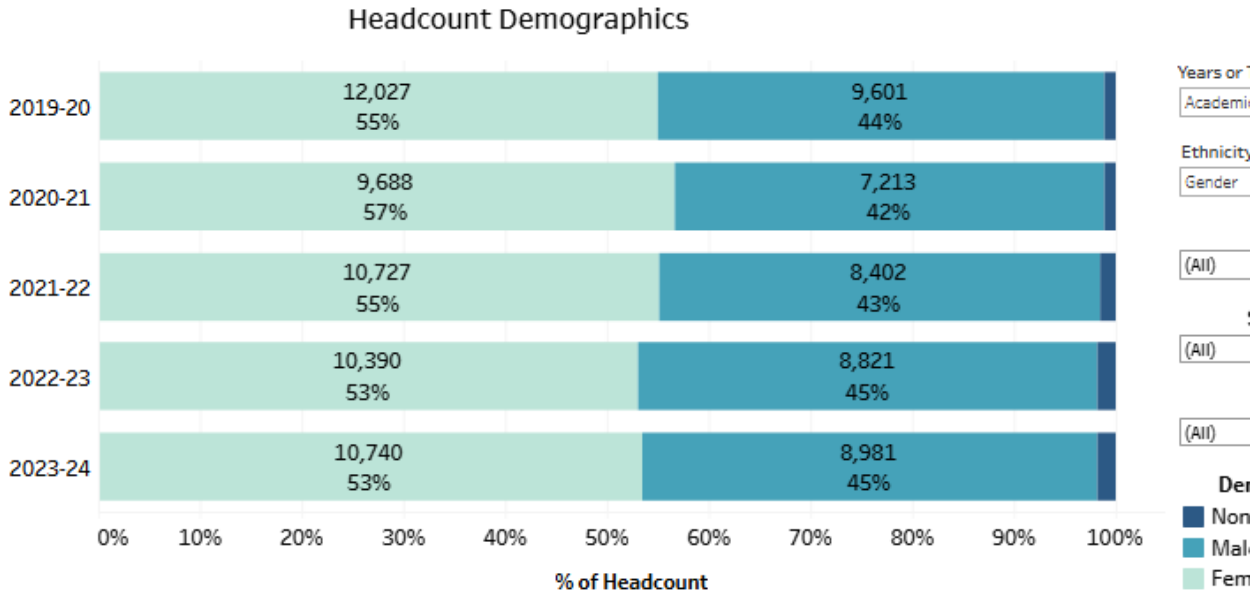
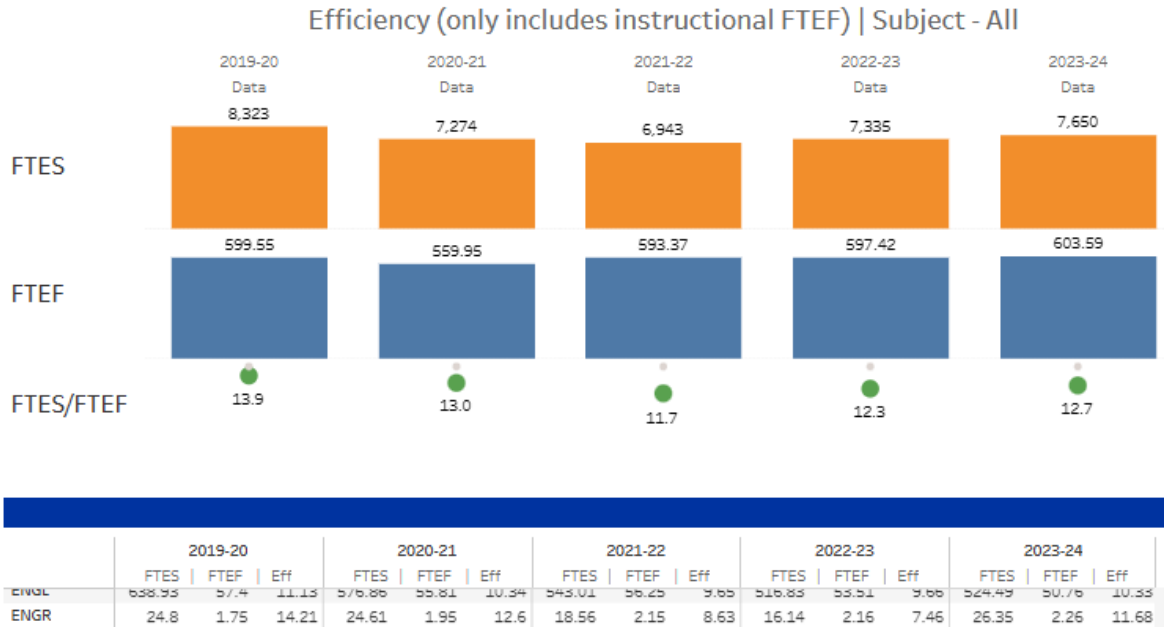
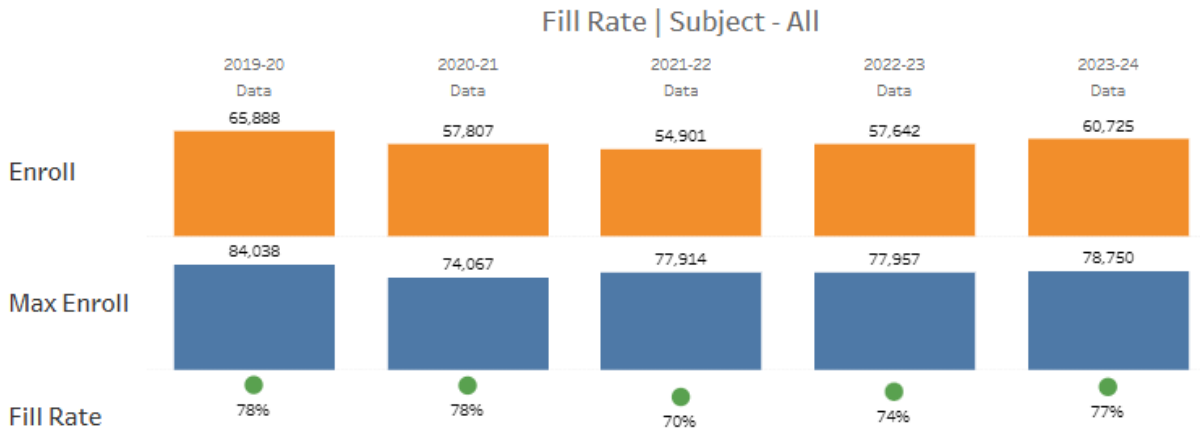


Figure A4b AHC Enrollment, by Gender, AY 2019-20 through AY 2023-24.



	2019-20			2020-21			2021-22			2022-23			2023-24		
	FTES	FTEF	Eff	FTES	FTEF	Eff	FTES	FTEF	Eff	FTES	FTEF	Eff	FTES	FTEF	Eff
ENGL	638.93	57.4	11.13	576.86	55.81	10.34	543.01	56.25	9.65	516.83	53.51	9.66	524.49	50.76	10.33
ENGR	24.8	1.75	14.21	24.61	1.95	12.6	18.56	2.15	8.63	16.14	2.16	7.46	26.35	2.26	11.68

Figure A5 FTES, FTEF, Efficiency (FTES/FTEF), AHC (top), Engineering (table), 2019-20 through AY 2023-24.



	2019-20			2020-21			2021-22			2022-23			2023-24		
	Enroll	Max Enroll	Fill%	Enroll	Max Enroll	Fill%	Enroll	Max Enroll	Fill%	Enroll	Max Enroll	Fill%	Enroll	Max Enroll	Fill%
ENGL	5,509.0	6,184.0	89.08	5,005.0	6,003.0	83.37	4,713.0	5,973.0	78.91	4,545.0	5,318.0	85.46	4,616.0	5,136.0	89.88
ENGR	322.0	400.0	80.5	321.0	390.0	82.31	232.0	364.0	63.74	226.0	330.0	68.48	339.0	372.0	91.13

Figure A6 Fill Rate, AHC (top), Engineering (table), 2019-20 through AY 2023-24.

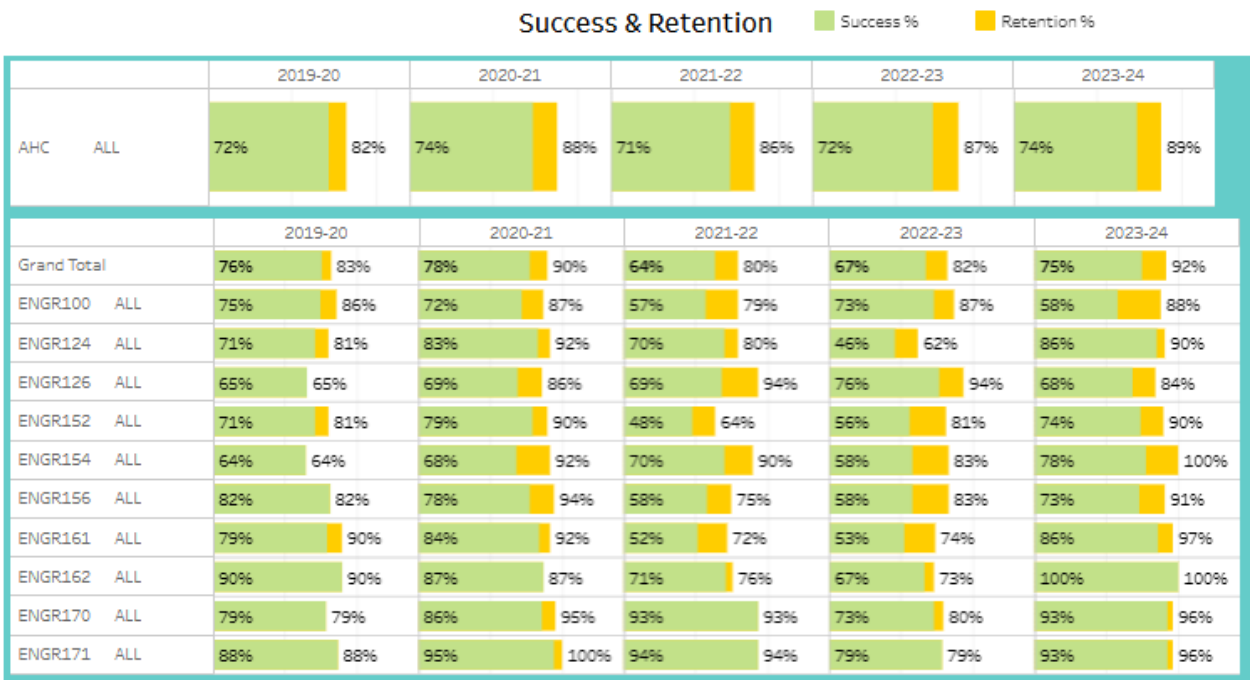


Figure A7 Retention/Success in Engineering, AY 2019-20 through AY 2023-24.

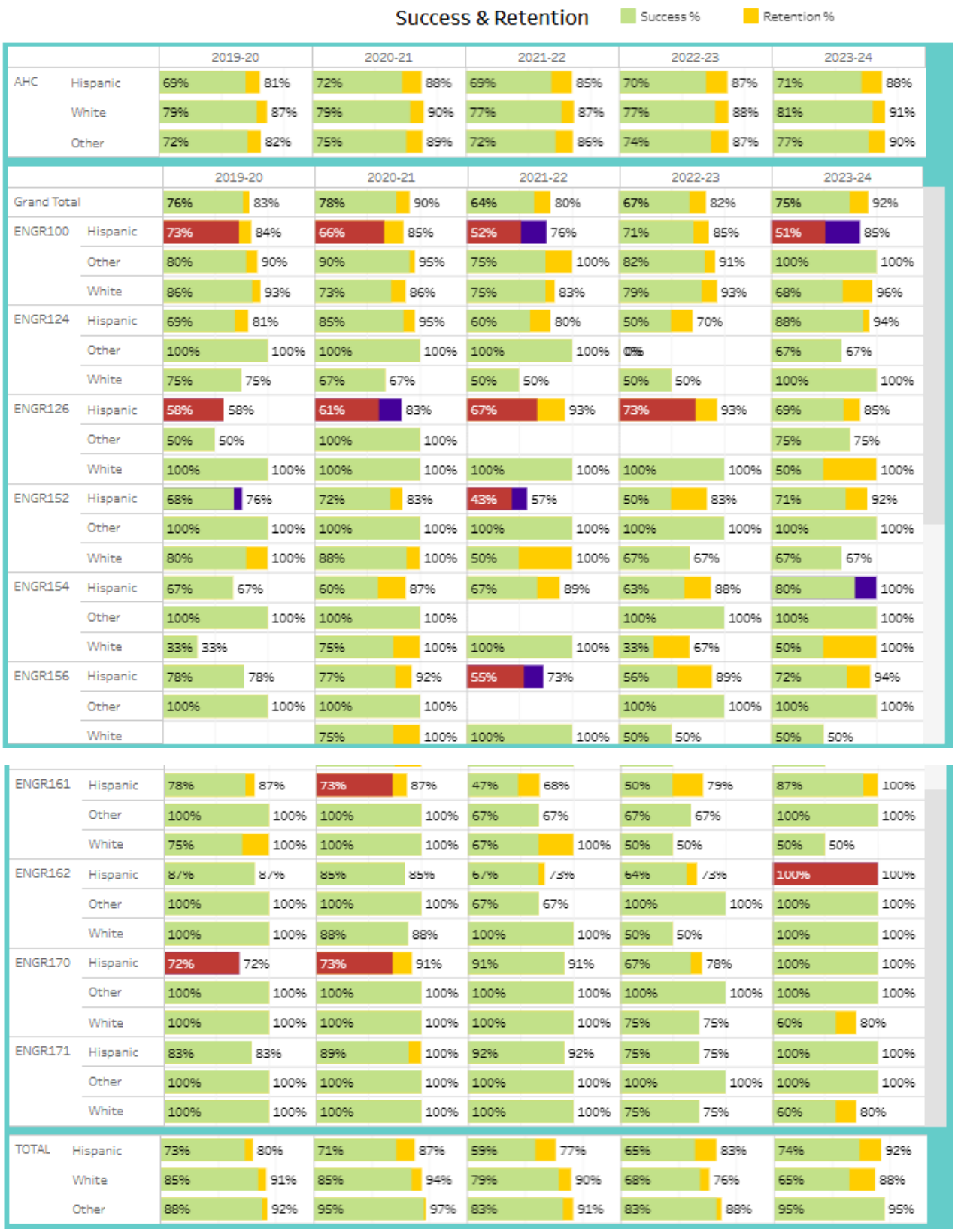


Figure A8 Success and Retention, by Race/Ethnicity (Simple) AY 2019-20 through AY 2023-24.

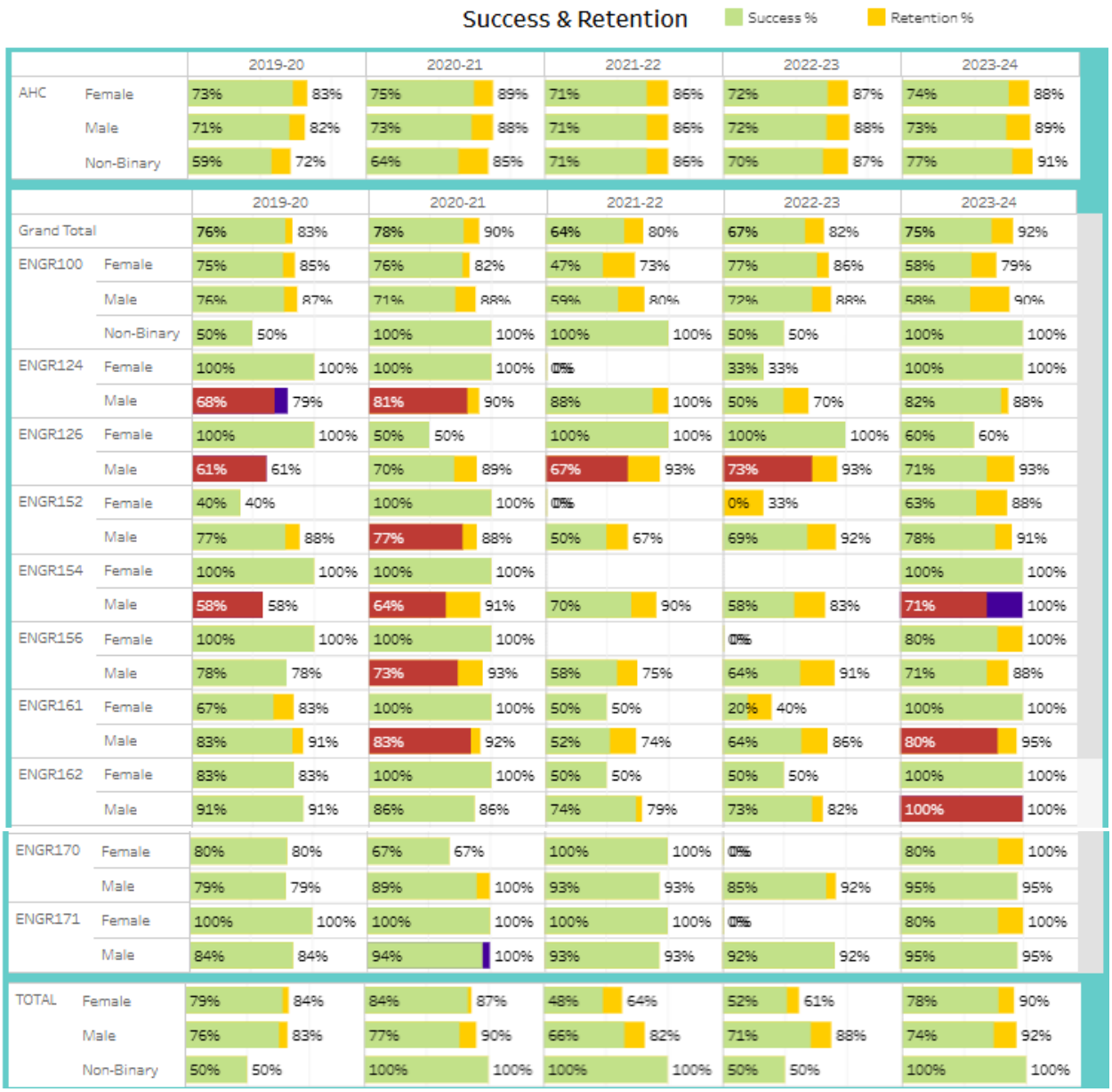


Figure A9 Success and Retention, by Gender, AY 2019-20 through AY 2023-24.

Input	Program	Source	Year	Institute or Department	Resource Need	Requested Item(s) Please include per item cost	Funding Request	Program Funds and Timing	Institute or Department Cost
Identification Question	Select	Select Source and Explain	Select Year	Select All or List	Explanation	Explain Needed Items and Associated Costs	Dollars	Yes or No	Dollars

Input	Program	Source	Year	Institute or Academic Unit	Resource Need	Request/Activity/Line Item Justification	Funding Request	Program Faculty and Young	Graduate or Research Staff
Number	Degree Master's	Salary Planning pool	2022/2023	Number of	Equipment Supplies	Please order on one line	Decimal	0 Digit	0 Digit

Input	Program	Source	Input	Initiative or Objective #	Resource Need	Requested Item(s)	Funding Request	Program Faculty and Priority	Estimated Procurement Cost
Model	Degree Master	Yearly Planning Level	12/31/2020	Number or	Year(s)	Short Name	Purpose	1 (High)	$ - 10000000

Dept	Program	Source	Year	Initiative Objective #	Resource Need	Request brief but key points not made per item note	Funding Request	Program Priority (not Priority	Estimate of Recurring cost
Police	Digital Modern	Safety Planning Level	2022-2026	2019 Obj. 3	Technology	New software program	One time	1=High	0 400000
Preservation Services	Hazlit	Safety Planning Level	2022-2026	3 Change Pro	Technology	Software, MATH 08, 10 and 08 Manual 2004 units	Ongoing	1=High	1 100000

Building maintenance, furniture requests, repairs

FACILITIES

Dept	Program	Source
English	English Rhetoric	Yearly Planning and Core Topic

Year	Initiative (Objective) Reference	Resource Need
2022-2023	ER OBJ.- 3	Facilities

Requested Item(s) please include per item cost	Funding Request	Program Faculty Lead Priority
Need air conditioning	One-time	1 = High

TOTAL **TOTAL**

Estimated Equipment Cost	Estimated Instructional/Restricted Lottery Cost
$ 400.00	

	$ -
	$ -
	$ -
	$ -
	$ -
	$ -
	$ -

	$ -
	$ -
	$ -

$ 400.00	**$ -**

Host	Program	Rooms	Cost	Caterer's Requirements	Resources Need	Requested Activity (please include per item cost	Funding Request	Program Funds Host Family	Contractor Payment Cost

Engr PReview 2024-2025 and resource

Final Audit Report 2025-07-17

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