SOLANO COLLEGE ACADEMIC PROGRAM REVIEW

AERONAUTICS

2017-2018

ASSESSMENT SCHEDULE

Year 1: Program Review
Year 2: SLO Assessment
Year 3: Curriculum Review
Year 4: PLO Assessment
Year 5: SLO Assessment
Year 6: Preparation for Program Review
*If it is the first time a course is taught, the SLO must be assessed that semester.

School of Applied Technology and Business
2016-2017 – SLO and PLO Assessments
2017-2018 – Program Review
2018-2019 – SLO Assessment
2019-2020 – Curriculum Review + Abridged Program Review (CTE)
2020-2021 – PLO Assessments
2021-2022 – SLO Assessment + Abridged Program Review (CTE)
School of Health Sciences & Counseling
2016-2017 – SLO Assessments
2017-2018 – PLO Assessments
2018-2019 – Program Review
2019-2020 – SLO Assessments
2020-2021 – Curriculum Review + Abridged Program Review (CTE)
2021-2022 – PLO Assessments
School of Social & Behavioral Sciences
2015-2016 – Curriculum Review
2016-2017 – SLO Assessments + Abridged Program Review (CTE)
2017-2018 – PLO Assessments
2018-2019 – SLO Assessments + Abridged Program Review (CTE)
2019-2020 – Program Review
2020-2021 – SLO Assessments
2021-2022 – Curriculum Review+ Abridged Program Review (CTE)
School of Math & Sciences
2015-2016 – Curriculum Review (1st half), Program Review (2nd half)
2016-2017 –SLO Assessments (1st half), Curriculum Review (2nd half)
2017-2018 – PLO Assessments (1st half), SLO Assessments (2nd half)
2018-2019 – SLO Assessments (1st half), PLO Assessment (2nd half) + Abridged Program Reviews (CTE)
2019-2020 – Any outstanding PLO/SLO assessments
2020-2021 – Program Review (all)
2021-2022 – SLO Assessments

CONTENTS

PROGRAM OVERVIEW & MISSION

1.1 Introduction. Introduce the program. Include the program's catalogue description, its mission, the degrees and certificates offered (including the courses required for the degrees). Include the names of full-time faculty, adjunct faculty, and classified staff. Give a brief history of the program and discuss any recent changes to the program or degrees (Limit to 2-3 pages).

Catalog description, 2017-18:

Airframe Maintenance Technician

Program Description
Practical and theoretical knowledge in basic maintenance techniques, plus the special requirements of either airframe or powerplant work. Upon satisfactory completion of the required courses, the student is eligible to take the Federal Aviation Administration written oral and practical examination for airframe or powerplant license.

Certificate of Achievement and Associate in Science Degree
A Certificate of Achievement can be obtained upon completion of the 41-unit major listed below. An Associate in Science Degree can be obtained upon completion of the units required for the major in either Airframe or Powerplant or Airframe and Powerplant and general education requirements.

A combination Airframe & Powerplant Maintenance Technician Certificate of Achievement can be obtained upon completion of the 41-unit airframe major and 21-unit powerplant courses. An Associate in Science Degree can be obtained upon completion of the units required for the airframe major, powerplant courses and general education requirements.

The Federal Aviation administration (FAA) requires 1150 hours (four full semesters) of instruction to complete the Airframe curriculum (An additional 750 hours, two full semesters for Airframe and Powerplant). All courses in the major must be completed with a grade of C or better or a P if the course is taken on a Pass/No Pass basis.

Program Outcomes
Students who complete the Airframe Maintenance Technician or Airframe & Powerplant Maintenance Technician Certificate of Achievement/Associate Degree will be able to:

1. Demonstrate proficient, entry-level aviation maintenance skills in airframe and powerplant with emphasis on aircraft engines, aircraft structures, and aircraft systems.
2. Have a working knowledge to inspect, maintain, service and repair aircraft electrical, engine (piston and turbine), airframe structure, flight control, hydraulic, pneumatic, fuel, navigation and instrument systems and other aircraft components specified by Federal Aviation Regulation Part 147.
3. Obtain an FAA, Airframe and Powerplant License upon completion of the Federal Aviation Administration (FAA) knowledge, oral, practical and written examination in general, airframe, and powerplant subjects.

REQUIRED COURSES	**Units**
AERO 055 Aviation Maintenance Technician General I	10
AERO 102 Airframe Maintenance I	10
AERO 103 Aviation Maintenance Technician General II	10
AERO 105 Airframe Maintenance II	10
AERO 118 FAA Airframe Test Review & Qualification	1
Total units	**41**

Recommended Electives:
AERO 150 FAA Special Projects-Airframe Enhancement
OCED 090 Occupational Work Experience
OCED 091 General Work Experience

For combined Airframe & Powerplant Maintenance Technician Requied Courses (In addition to the 41 units listed above)	**Units**
AERO 106 Powerplant Maintenance I	10
AERO 107 Powerplant Maintenance II	10
AERO 119 FAA Powerplant Test Review & Qualification	1
Total units	**21**

Powerplant Maintenance Technician

Program Description
Practical and theoretical knowledge in basic maintenance techniques, plus the special requirements of either powerplant or airframe & powerplant work. Upon satisfactory completion of the required courses, the student is eligible to take the Federal Aviation Administration written, oral, and practical examination for powerplant or airframe & powerplant license.

Certificate of Achievement and Associate in Science Degree
A Certificate of Achievement can be obtained upon completion of the 41-unit powerplant major. An Associate in Science Degree can be obtained upon completion of the units required for the powerplant major and general education requirements.

A combination Airframe & Powerplant Maintenance Technician Certificate of Achievement can be obtained upon completion of the 41-unit powerplant major and 21-unit airframe courses. An Associate in Science Degree can be obtained upon completion of the units required for the powerplant major, airframe courses and general education requirements.

The Federal Aviation Administration (FAA) requires 1150 hours (four full semesters) of instruction to complete the Powerplant curriculum (An additional 750 hours, two full semesters for Airframe and Powerplant). All courses in the major must be completed with a grade of C or better or a P if the course is taken on a Pass/No Pass basis.

Program Outcomes
Students who complete the Powerplant Maintenance Technician or Airframe & Powerplant Maintenance Technician Certificate of Achievement / Associate Degree will be able to:

1. Demonstrate proficient, entry-level aviation maintenance skills in powerplant or airframe and powerplant with emphasis on aircraft engines, aircraft structures, and aircraft systems.
2. Have a working knowledge to inspect, maintain, service and repair aircraft electrical, engine (piston and turbine), airframe structure, flight control, hydraulic, pneumatic, fuel, navigation and instrument systems and other aircraft components specified by Federal Aviation Regulation Part 147.
3. Obtain an FAA, Powerplant or Airframe and Powerplant License upon completion of the Federal Aviation Administration (FAA) Knowledge, oral, practical and written examination in general, powerplant or airframe and powerplant subjects.

REQUIRED COURSES	**Units**
AERO 055 Aviation Maintenance Technician General I	10
AERO 103 Aviation Maintenance Technician General II	10
AERO 106 Powerplant Maintenance I	10
AERO 107 Powerplant Maintenance II	10
AERO 119 FAA Powerplant Test Review & Qualification	1
Total units	**41**

For combined Airframe & Powerplant Maintenance Technician Certificate or Degree Required Courses (In addition to 750 hours, 2 semesters)	**Units**
AERO 102 Airframe Maintenance I	10
AERO 105 Airframe Maintenance II	10
AERO 118 FAA Airframe Test Review & Qualification	1
Total Units	**21**

Recommended Electives:
AERO 150 FAA Special Projects-Airframe Enhancement
OCED 090 Occupational Work Experience
OCED 091 General Work Experience

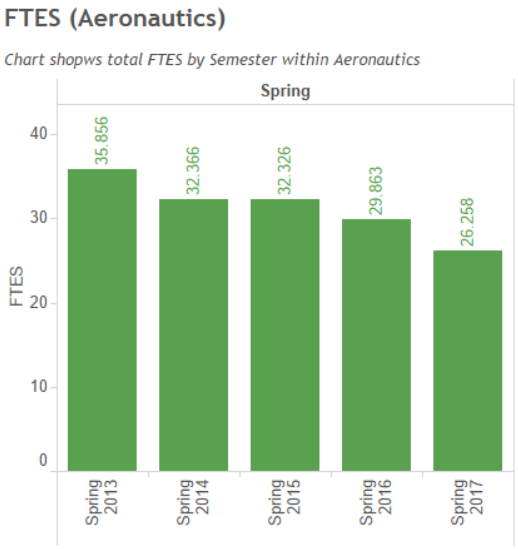
The program has been based at the Nut Tree Airport aero-hangar since the 1990s. Over the last several years, new lab project boards and training aids have been added, and have quadrupled the number of training aircraft available for students. The program includes two tracks: Airframe and Powerplant. Students can earn a certificate recognized by the Federal Aviation Administration (FAA) in each, with coursework approved by the FAA, and are designed to be taken consecutively. The FAA performs biannual inspections of the program, and has continued to approve our certificates. A third "general subjects" track is a mandatory year-long set of coursework, which can be taken at any point in a student's study, which is part of both certificates. Students also can earn an associate's degree, but students must take their general education requirements at a different site. No recent changes have been made to the program.

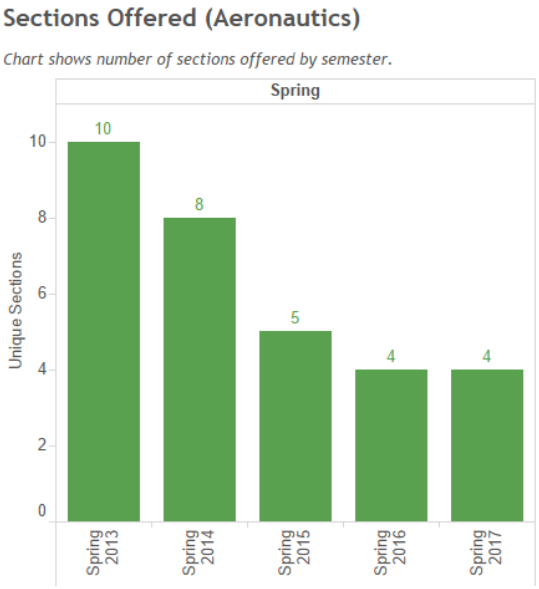
Faculty include Kevin Spoelstra and Rusty Mayes (full time), and no adjunct.

1.2 Relationship to College Mission. Describe two or three components of your program that embody the college's mission: "Solano Community College's mission is to educate a culturally and academically diverse student population drawn from our local communities and beyond. We are committed to helping our students achieve their educational, professional, and personal goals. Solano transforms students' lives with undergraduate education, transfer courses, career-and-technical education, certificate programs, workforce development and training, basic-skills education, and lifelong-learning opportunities." (Limit to 1-2 paragraphs)

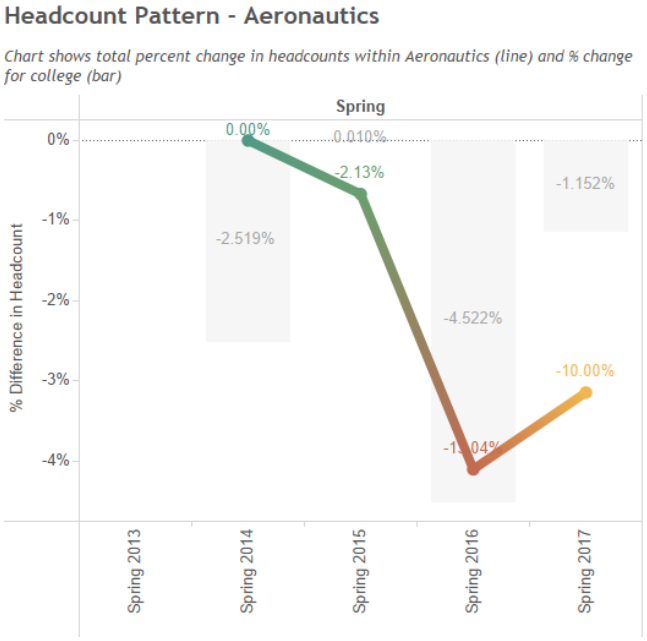
The decision to take both certificates rests with each students; however, faculty encourage students to pursue both certificates, to maximize their employment opportunities. The mission of the program is to prepare students not only to take the relevant exams, but also to prepare students for employment in the aviation industry or related industries (for example, agriculture, aerospace, petroleum refinement, solar industries). We provide technical training that can be applied to multiple industries, encompassing 47 subject areas.

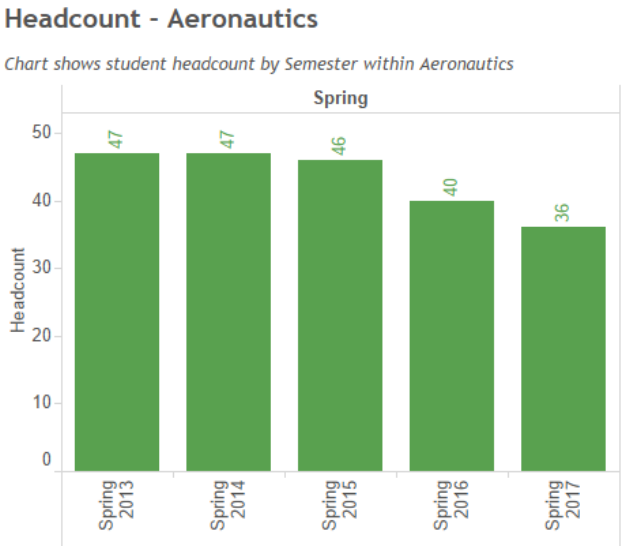
1.3 Enrollment. Utilizing data from Institutional Research and Planning (ITRP), analyze enrollment data. In table format, include the number of sections offered, headcounts, and the full-time equivalent enrollment (FTES) for each semester since the last program review cycle. If data is available for the number of declared majors in the discipline, please include as well. Compare the enrollment pattern to that of the college as a whole and explain some of the possible causal reasons for any identified trends. For baccalaureate programs, include any upper division general education courses as part of the analysis. Also, address the efficacy of recruitment and student placement in the program including any collaborations with other colleges.





The chart above shows fewer sections offered in recent years, due to updating and streamlining of offered courses. All courses offered are included in the certificate, and are relevant to program learning outcomes. As the charts below indicate, FTES has remained consistent with the college as a whole, and headcount has dropped only slightly in the past few years. The enrollment numbers remain healthy.





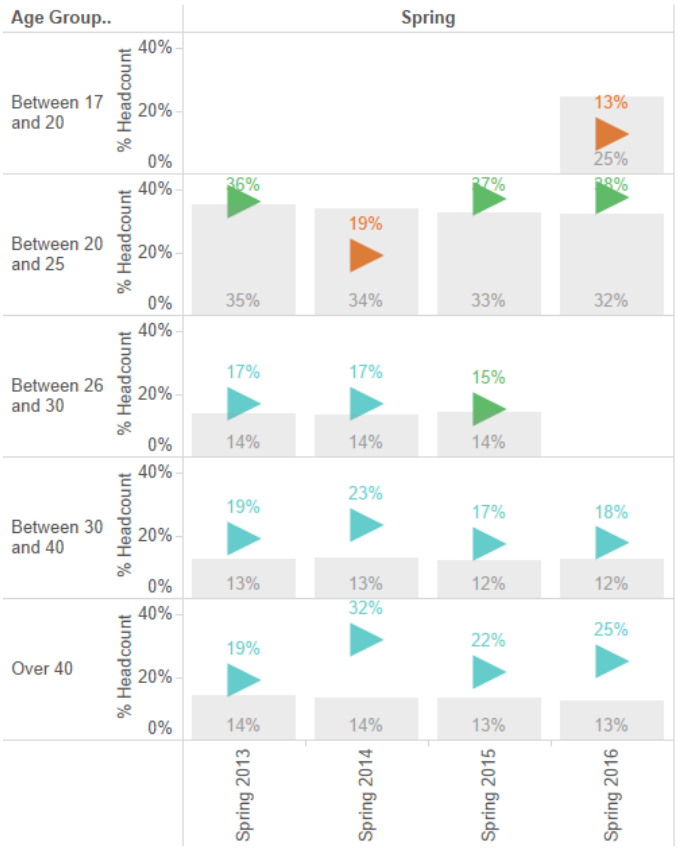
1.4 Population Served. Utilizing data obtained from Institutional Research and Planning, analyze the population served by the program (gender, age, and ethnicity) and discuss any trends in demographic enrollment since the last program review. Explain possible causal reasons for these trends, and discuss any actions taken by the program to recruit underrepresented groups.

Pop Served Gender (Aeronautics)

Chart shows % headcount by gender (triangle represents within discipline, grey bar within institution). Disproportionate impact (80% of institution percentage) is noted in triange color.
Only shows student groups greater than 4 students

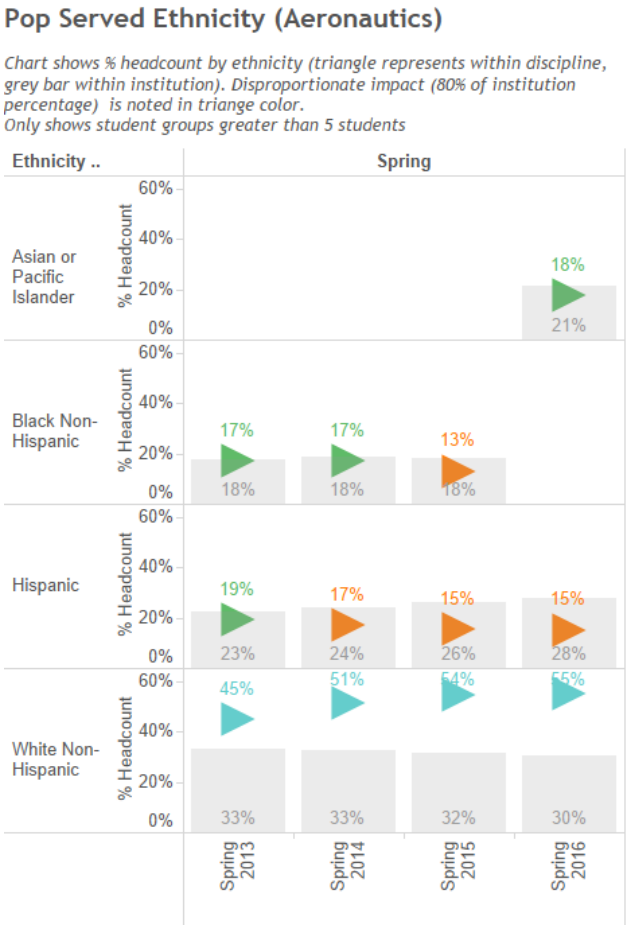
Pop Served Age (Aeronautics)

Chart shows % headcount by age group (triangle represents within discipline, grey bar within institution). Disproportionate impact (80% of institution percentage) is noted in triange color.
Only shows student groups greater than 4 students



Our students include many veterans who are taking the program using the GI Bill and VA benefits. This explains in part the larger percentage of somewhat older students in the program, compared with the college as a whole. The percentage of female students has risen slightly in the past year.

The demographics of the program reflect the broader demographics of the military in the U.S.; the diversity of our students is not comparable to the diversity of the college as a whole.



***1.5 Status of Progress toward Previous Goals and Recommendations*.** Report on the status of goals or recommendations identified in the previous program review or in the most recent update. (Please ensure your goals are updated at least yearly.) For status, note if completed, suspended, in progress, or now part of routine department activities. In-progress goals should be added to Table 4.

Table 1. Status of Previous Goals

Program Goals	Planned Action (s)	Status
Create new degree/certificate	Continue to support and consult with college administration regarding International Accelerated Aviation Maintenance Training Certificate Program	Discontinued. This program is ill-advised, and will not serve students.
Assessment Goals	Planned Action (s)	Status
Assessment is up-to-date and ongoing; no goals at this time		
Curriculum Goals	Planned Action (s)	Status
Other	Continue improving curriculum rigor and updating to industry needs	Ongoing.

Create new course(s)	Consult with ICON to assess the value of establishing an advanced composite fabrication course	Ongoing.
Review/change course scheduling	Continue to consider adding an afternoon or evening program; Conduct a needs assessment	Discontinued. There is no capacity, with current staffing, to expand to an evening program.
Campus & Community Integration/Outreach Goals	Planned Action (s)	Status
Other	Establish an advisory committee; Invite industry representatives, establish agenda	Completed, see section 1.9 below.
Student Equity & Success Goals	Planned Action (s)	Status
Other	Encourage students to apply for Certificates of Achievement through Solano College; Invite Admissions and Records to have them complete forms for graduation	Ongoing Completed. Students are encouraged to complete forms online.
Professional Development Goals	Planned Action (s)	Status
No professional development goals at this time		
Human Resources Goals	Planned Action (s)	Status
Add/replace/change staff position	Change full-time Lab-tech position to 2 20 hr./wk. positions	Suspended. A current full-time position cannot be converted at this time.
Add/replace/change staff position	Hire part-time clerk for administrative responsibilities in the Aeronautics program	Ongoing; greatly needed and discussed with administration, though no action has been taken.
Technology & Equipment Goals	Planned Action (s)	Status
Add/upgrade classroom/lab technology, equipment, instructional materials	Purchase two additional aircraft for the program lab instruction	Completed.
Add/upgrade classroom/lab technology, equipment, instructional materials	Purchase aircraft electrical trainer	Completed.

Add/upgrade classroom/lab technology, equipment, instructional materials	Replace existing shop compressor	Ongoing need.
Add/upgrade classroom/lab technology, equipment, instructional materials	Replace obsolete equipment with current and relevant technology	Ongoing.
Facilities Goals	Planned Action (s)	Status
Other facilities goal	Obtain additional storage space for off-year lab supplies	Completed.
Library Resource Goals	Planned Action (s)	Status
Library resources are up-to-date; no goals at this time		
Other Resource Goals	Planned Action (s)	Status

1.6 Previous Program Review Goals Leading to Improvement. Describe any improvements that were made to the program based on the previous program review goals. Include any available data/evidence about how those improvements had a positive impact on student access and/or student success.

The new equipment have allowed students to spread out as they work, and students can work individually and in small groups to maximize their learning. Faculty observe how students are much more engaged, now that they can take a "front seat" in their learning, and get more meaningful, hands-on experience. The equipment further provides relevant support to lecture material, so students can see the practical applications immediately.

1.7 Future Outlook. Describe both internal and external conditions expected to affect the future of the program in the coming years. Include labor market data as relevant for CTE programs. The California Labor Market website allows employment projections by occupation at the state and county level: http://www.labormarketinfo.edd.ca.gov/ "Cal-PASS Plus offers longitudinal data charts, detailed analysis of pre-K through 16 transitions and workplace outcomes, information and artifacts on success factors, and comparisons among like universities, colleges, K-12 school systems and schools": https://www.calpassplus.org/ . (Limit to one page or less.)

Following is the OES Employment and Wages Data Table for the first quarter of 2016:

				2016 - 1st Quarter Wages					
Geographic Area Name	SOC Code	Occupational Title	May 2015 Employment Estimates	Mean Hourly Wage	Mean Annual Wage	Mean Relative Standard Error (1)	25th Percentile Hourly Wage	50th Percentile (Median) Hourly Wage	75th Percentile Hourly Wage
California Statewide	17-3021	Aerospace Engineering and Operations Technicians	2,110	$35.71	$74,271	1.70	$30.18	$35.51	$41.48

Source: State of CA Employment Development Department, http://www.labormarketinfo.edd.ca.gov/data/oes-employment-and-wages.html#Tool

The numbers provided above by the State appear relatively accurate as a mean. Graduates with entry-level skills and experience will earn about $22/hour. Professionals with longer experience

could earn in excess of $100,000. There are extensive overtime opportunities in this field. Also, earnings depend heavily on the type of employer; a maintenance worker for a Fortune 500 flight department can make much than the worker who supports general aviation maintenance needs.

Following is the Projection of Employment by Occupation, 2014-2024, California Employment Development Department:

TOP Code(s):

- 095000 Aeronautical and Aviation Technology

Geography: California
Includes: All California Counties

Annual Job Openings by Occupation

SOC Code	Occupation Title (Linked to "Occupation Profile")	2014 Employment	Annual Job Openings (1)
493011	Aircraft Mechanics and Service Technicians	13,200	490
512011	Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	2,900	70
492091	Avionics Technicians	1,900	50
	Total	18,000	610

(1) Total Job Openings are the sum of new jobs from growth plus net replacements. Annual job openings are total job openings divided by the number of years in the projection period.

Source: http://www.labormarketinfo.edd.ca.gov/commcolleges/Projections.asp

Employers regularly contact our faculty, seeking recommendations for graduates to work as mechanics, and in related fields. Budweiser's plant in Fairfield reaches to faculty, seeking graduates with technical training to maintain the factory machines.

Career Technical Education Planning

(Non-CTE program proceed to Section 2, Assessment.)

1.8 Advisory Boards/Licensing (if applicable). Describe how program planning has been influenced by advisory board/licensing feedback. How often are advisory board meetings held, provide membership information and what specific actions have been taken. Attach minutes from the past two years in an appendix.

Our faculty participate in the broader CTE advisory board, and have invited multiple aviation industry guests to lend their experience to the overall evaluation of the CTE school and its programs. As a result of advisory board recommendations, the program expanded its equipment and space, resulting in student success (as noted in section 1.6, above). The new equipment, suggested by the experts, has added rigor to the program and expanded learning.
For minutes, see Appendix A.

1.9 Core Indicator Report. Review the Perkins core indicator reports for your TOP code: https://misweb.cccco.edu/perkins/Core_Indicator_Reports/Summ_coreIndi_TOPCode.aspx .

What are the areas of needed improvement? What efforts have you already made and/or plan to make to support students in these areas? (Limit to 1-2 paragraphs)

Not every student who starts the program completes, but from Fall 2017-Spring 2018, we have seen 97% retention—only one student out of 38 left the program, due to health reasons, at the end of the Fall '17 semester. Students who earn the certificate are tracked for three months after completion, and not everyone takes the FAA license exams. The number of students pursuing the exams has increased; however, it costs about $1,200 for the written, oral, and practical testing, and that discourages some students and poses a barrier to completion. Students who plan to go into service after program completion find little benefit to the civilian license, which is not recognized by the U.S. armed services.

ASSESSMENT

Program Learning Outcomes

2.1 PLOs and ILOs. Using the table provided, list the Program Learning Outcomes (PLOs) and which of the institutional learning outcomes (ILOs) they address. In the same table, specifically state (in measurable terms) how your department assesses each PLO. State the course(s) and assignment(s) where the PLOs are measured. Additionally, please review the PLOs in the college catalogue to ensure they are accurate. If they are not, be sure to add as a goal (Table 4) plans to change PLOs in CurriCUNET and contact the curriculum office to ensure they are updated in the catalogue.

Table 2a. Program Learning Outcomes (FAA Airframe Mechanics Certificate)

Program Learning Outcomes: FAA Airframe Mechanics Certificate	ILO	How PLO is assessed
1. Use approved Data to perform a routine maintenance operation to airworthy standards. Students inspect and overhaul Air/Oil landing gear struts to airworthy standards.	IV C	Using manufacturers repair manuals, students working in groups of three remove, clean, inspect and overhaul then service leaking and flat landing gear struts on shop aircraft. Students install new seals and service with Mil 5606 fluid and nitrogen per service manuals. Success is measured by determining whether or not the strut will remain inflated to airworthy standards
2. Airframe structures/ Use learned skills and interpretation skills of approved data to fabricate an aircraft sheet metal project	IV C	Students will make accurate scale drawings of a given sheet metal project. In this case a simulated I beam spar structure. Students will identify materials and hardware to use and

		fabricate their project individually with materials provided and using tools that they have been trained to use properly and safely. The students finished project will be evaluated for accuracy of build by dimension and workmanship.

2.2 PLO Mapping. Report on how courses support the Program Learning Outcomes at which level (introduced (I), developing (D), or mastered (M)).

PLO mapping will be completed in CurricUNET Meta in the next PLO Assessment cycle.

2.3 PLO Results and Planned Actions. Utilizing Table 2c, summarize the results of program learning assessments and any planned actions to increase student success where deficits were noted. Results should be both quantitative and qualitative in nature, describing student strengths and areas of needed improvement. Action plans should be specific and link to Table 4 (goals) as well as any needed resources (Section 7.2) to achieve desired results. (If PLO Assessments are extensive, then make a note here and use Table 2c as an Appendix.) Then, in Table 2d, complete the assessment calendar.

Table 2c. Program Learning Outcomes Assessments

PLO 1	
Program Learning Outcome	Use approved Data to perform a routine maintenance operation to airworthy standards. Students inspect and overhaul Air/Oil landing gear struts to airworthy standards.
Date(s) Assessed	Spring 2017
Results	Most students were successful in overhauling and servicing their strut project. Struts were found to stay inflated and leak free.
Action Plan	This project was just implemented this semester as we have been building our inventory of shop aircraft on which students are able to make real world repairs. Due to the success of this project no changes are planned.

PLO 2	
Program Learning Outcome	Airframe structures/ Use learned skills and interpretation skills of approved data to fabricate an aircraft sheet metal project
Date(s) Assessed	Spring 2017
Results	Most students were successful in generating an accurate drawing and materials list as directed to the standard expected. They then performed various bending and fastening operations to create a simulated section of an I beam spar. Final projects were evaluated and scored for accuracy of design, dimension and general workman ship. Students were required to score at least 70% to be considered successful.

Action Plan	This sheet metal skills project has been in use for several semesters of the airframe structures course. It challenges students on many levels. It has proven to be an excellent indicator of skills learned during the course and we have no plans to change this as a final sheet metal skills project.

Table 2d. PLO Assessment Calendar

Faculty typically choose to assess all the PLOs during the same academic year. Please mark the year they will take place (refer to the assessment schedule, p. 2).

	F17	S18	F18	S19	F19	S20	F20	S21	F21	S22
PLO1					x					
PLO2					x					

2.4 PLOs Leading to Improvements. Describe any changes made to the program or courses that were a direct result of program learning outcomes assessments.

Students have been overall successful in achieving their PLOs. No changes have been made to the program based on PLO assessment; however, the added equipment led to changes in daily assignments and changes.

Student Learning Outcomes

2.5 SLOs Status. Describe the current status of SLOs in your program. If deficiencies are noted, describe planned actions for change and include these in your goals (Table 4).

- Are there 2-4 measurable SLOs for each course in your discipline?
- Have success criteria rubrics been created to standardize the evaluation of student success?
- Have faculty assessed the Student Learning Outcomes according to the published Assessment calendar (at least twice in a program review cycle)? You may wish to include a SLO assessment calendar for each course in the discipline (Table 3); move to appendix if lengthy. Do the assessments follow the guidelines for quality outlined in the *SLO Quality Assessment Rubric*?
- Have faculty engaged in discussions about SLOs, success criteria, and their assessments as they relate to the improvement of student success and the challenges students face?
- Have faculty disaggregated any of the assessment results to show specific areas of need in the classroom (for example, commonalities among students who are less or more successful such as attendance, use or lack of use of student support services, proficiency or difficulty with writing, role overload or other stressors outside of school, etc.)?
- If deficiencies are noted in any of the above areas, describe planned actions for change.

All changes were made in CurricUNET Meta before the deadline, and course SLOs were all mapped to ILOs. Student assessment is based on objective written tests and subjective lab work. Industry standards provide set criteria for accurate and complete lab work, and criteria

are mandated by the FAA curricula. Faculty meet regularly to discuss student success, and areas of needed curriculum improvement, adding components to increase the rigor and student learning success as appropriate.

2.6 SLOs Leading to Improvements. Describe any changes made to the program or courses that were a direct result of student learning outcomes assessments.

Every assignment is looked at critically, for improvements and changes that will lead to student learning. Changes are made fluidly, on a daily basis, based on availability of shop equipment and training aids (for example, a new aircraft may become available on the field for students to observe and examine). This fluidity keeps the program current and relevant to current industry standards.

General Education & Institutional Learning Outcomes

2.7 GELOs and ILOs. Review any general education courses offered by your program to ensure they are accurately linked with the appropriate general education learning outcome (GELO) in the CurriCUNET assessment module, and that the GELO is measurable in the SLO(s) of the course. Then review all courses and their SLOs in CurriCUNET to ensure they are accurately linked with the appropriate institutional learning outcomes (ILOs), and that they are measurable. In most cases there will only be one GELO and/or one ILO link per SLO. Report on changes that need to be made in order to effectively integrate GELOs and ILOs into instruction.

As noted above, all SLOs have been mapped to relevant ILOs.

CURRICULUM

3.1 Course offerings. Attach a copy of the course descriptions from the most current catalogue.

See Appendix A.

Describe any changes to the course offering since the last program review cycle (course content, methods of instruction, etc.) and provide rationale for deletion or addition of new course offerings. If there are courses in the catalogue that haven't been offered in the past two years, state the course(s) and note the reason(s) they haven't been offered (no faculty to teach, low enrollment, etc.). State the plans for either offering or inactivating/deleting these courses. Also state whether any new degrees of certificates have been created and the rationale for doing so. For baccalaureate programs, include any upper division general education courses as part of the report.

Since the last 6-year program review, several outdated courses have been eliminated from the catalog. There remain two courses in the current catalog that will be deleted: AERO 150 and 151. These courses are also outdated, and there are no faculty to teach them. All other courses in the catalog are regularly offered, so that students can complete their coursework in a timely manner.

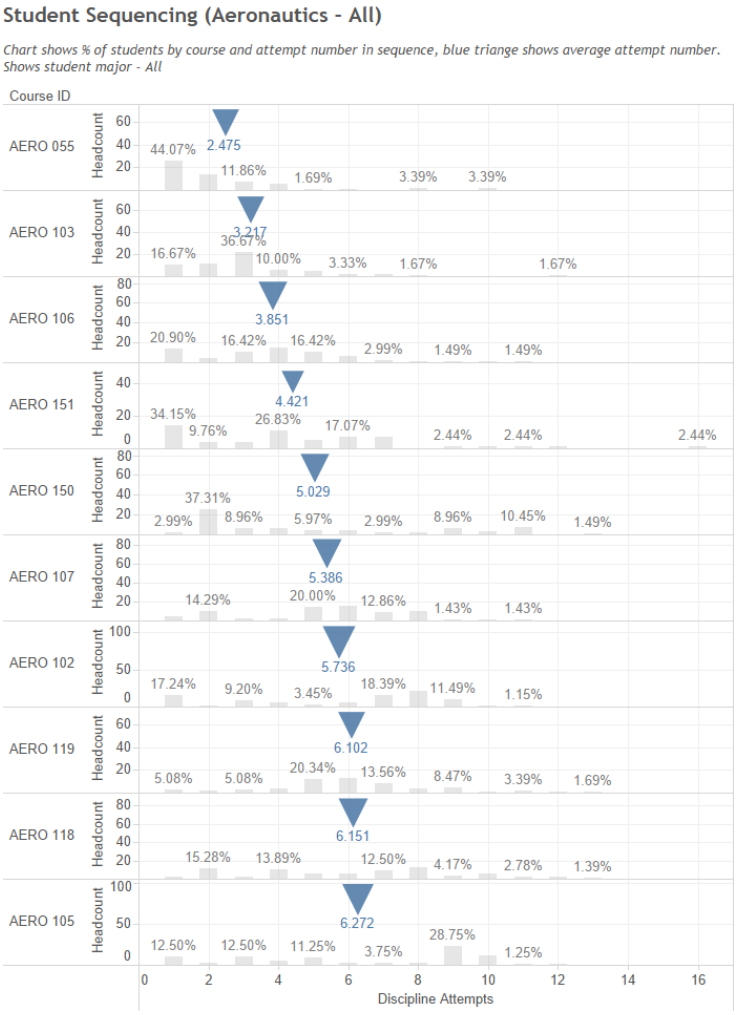
3.2 Scheduling and Sequencing. Discuss efforts to optimize access through scheduling. How have faculty (in collaboration with deans) planned the timing, location, and modality of courses? Report on whether courses have been sequenced for student's timely progression through the major, how students are informed of this progression, and the efficacy of this sequencing. Report on whether curriculum is being offered in a reasonable time frame and if there are plans/goals for scheduling changes. (Limit to 1-2 paragraphs)

As noted above, courses are offered regularly. AERO 103 and 107 are not offered each semester, but both are currently being taught (in Spring 2018). All courses are offered two out of three years. The data for Spring 2013 is flawed, as there was only one section of each course offered.

Scheduling (Fall & Spring)

Chart shows number of sections offered by course id, campus and semester.

Course ID	Campus Sched Type	Fall 2012	Spring 2013	Fall 2013	Spring 2014	Fall 2014	Spring 2015	Fall 2015	Spring 2016	Fall 2016	Spring 2017
AERO 118	Nut Tree Airport - Vacavil..		3		3		1		1		1
AERO 119	Nut Tree Airport - Vacavil..		3		1		1		1		1
AERO 150	Nut Tree Airport - Vacavil..	2	1	1	1	1	1				
AERO 151	Nut Tree Airport - Vacavil..	2	1	1	1	1					
AERO 102	Nut Tree Airport - Vacavil..	1		1				1		1	
AERO 105	Nut Tree Airport - Vacavil..		1		1				1		1
AERO 055	Nut Tree Airport - Vacavil..			1		1				1	
AERO 103	Nut Tree Airport - Vacavil..				1		1				1
AERO 106	Nut Tree Airport - Vacavil..	1				1		1			
AERO 107	Nut Tree Airport - Vacavil..		1				1		1		

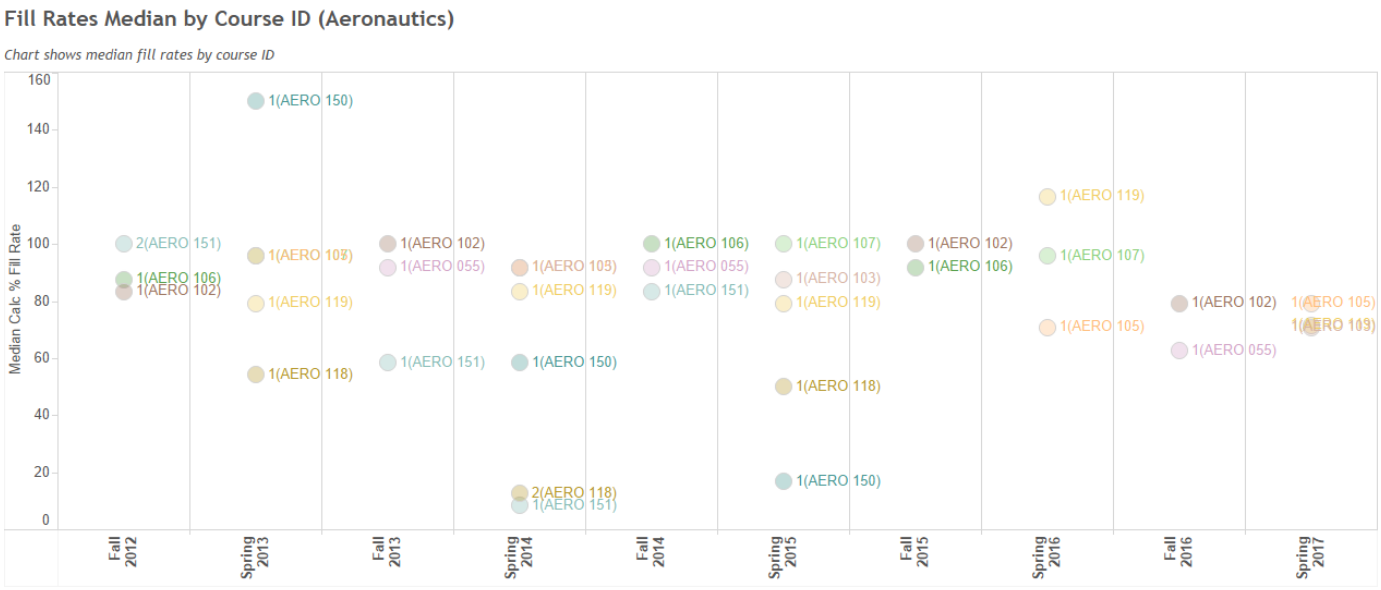


Students are given a calendar of courses offered, and in which semester, and students are given an individualized course schedule plan. This occurs in a mandatory orientation. The sequence shown in the chart at left is an appropriate sequence for the typical Aero student. But each student's plan varies, depending on what year the student starts, what's offered at that time, and what certificate they will pursue first. Students are fortunate that they can enter the program at any point in the academic year, and still have a pathway to timely completion (with 3 years).

3.3 Student Survey. Describe the student survey feedback related to course offerings. In terms of the timing, course offerings, and instructional format, how does what your program currently offer compare to student responses? Please include the student survey and any relevant charts as an appendix.

All surveys have been informal in nature. Faculty regularly communicate with students regarding student needs, program equipment usefulness, and lecture topics. As the program curriculum is mandated and approved by the FAA, students have less leeway in requesting certain types of courses or requesting changes in content.

3.4 Fill rates/Class size. Based on data from ITRP, discuss the trends in course fill rates and possible causes for these trends (include comparison/analysis of courses by modality if applicable). Address how the size of classes affects courses and if there are any necessary adjustments to course classroom maximums. If there are courses that are historically under-enrolled, discuss strategies that might increase enrollment. (Limit to 1-2 paragraphs)



Fill rates in recent years have been consistently over 70%. Classes are full, and, as noted above, the right size for the available equipment and facilities. We are mandated to have no more than 24 students per instructor in a given course. For two instructors, a maximum of 48 students can accommodated in the program, in any given semester. Our current number of students is 38, but last fall, there was a waitlist, and those students were accommodated due to no-shows/early drops.

3.5 Four-year articulation (if applicable). Utilizing the most current data from the articulation officer, and tools such as ASSIST.org, state which of your courses articulate with the local four year institutions and whether additional courses should be planned for articulation (Limit to 1-2 paragraphs).

There is no relevant Bachelor's degree for our program. Engineering majors would not be taking Aero courses.

3.6 High school articulation (if applicable). Describe the status of any courses with articulation/Tech Prep agreements at local high schools. What (if any) are your plans for increasing/strengthening ties with area high schools and advertising your program to prospective students? (Limit to 1-2 paragraphs).

There is currently no high school articulation, and faculty are not pursuing high school students as prospective program students. However, schools bring students to the Nut Tree facility for tours, and that could encourage students to apply in the future.

3.7 Distance Education (if applicable). Describe the distance education courses offered in your program, and any successes or challenges with these courses. Discuss any efforts to become involved with the Online Education Initiative (OEI). (Limit to 1-2 paragraphs)

n/a

CAMPUS & COMMUNITY INTEGRATION

4.1 Campus Integration. Describe how the program connects with the campus community. Include any cross-discipline collaborations, faculty representation on committees, student clubs, or other activities that benefit the college as a whole. (Limit to 1-3 paragraphs)

Faculty serve the college as a whole, including service on the Program Review committee and the Academic Senate. There is currently no outreach across disciplines, again due to the specific nature of the program.

4.2 Counseling. Contact the Dean of Counseling to schedule attendance at a Counseling School meeting to discuss any programmatic changes, possible career/transfer options for students, suggested course sequencing, and/or any other information you think would be important for counselors to know. Please provide a brief narrative of the visit. (Limit 1-2 paragraphs).

Faculty meet with counselors often, encouraging counselors to come to the Nut Tree facility to better understand what the program offers. Having an assigned CTE counselor is necessary, so that students will get the most informative assistance from counseling.

4.3 Community Ties. Describe how the program connects with the larger community. Include curricular activities, field trips, community/classroom partnerships, marketing efforts, etc. Faculty professional undertakings that support the community should also be included (conference presentations, professional publications, off-campus committee/advisory representation, etc.). (Limit to 1-3 paragraphs)

Students take multiple field trip over the course of the program; for example: ICON Aircraft, Sullivan Propeller, Advanced Helicopter, Williams Soaring (sail plane), Stockton Propeller, and Faeth Aircraft, and United Airlines. We have also received donations from Advanced Helicopter, Reach Air Ambulance, Rolls Royce Engines, Blue City Holdings, among others. We maintain a bulletin board for apprenticeship and employment opportunities, and our partnerships result in extensive outreach by prospective employers (as noted above). Many students have been hired thanks to these partnerships and postings.

STUDENT EQUITY & SUCCESS

5.1 Student Success/Underprepared Students

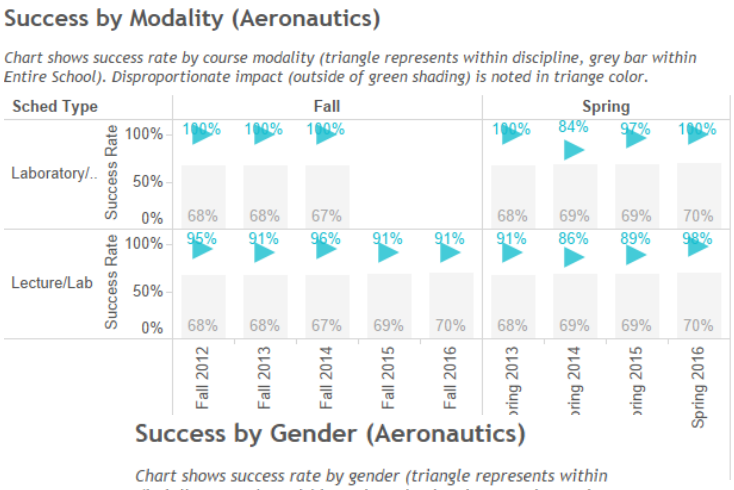
- Anecdotally describe how the program works to promote student success for *all* students

- Include how program faculty support *underprepared students* in such areas as fundamental writing and/or math competencies through use of teaching innovations, campus support services (library, counseling, DSP, tutoring, SARS, academic success center), etc.
- Have faculty analyzed prerequisites, co-requisites or advisory courses to determine potential need and potential impact on student success?
- If there are designated basic skills courses in your discipline, include how they prepare students for success in transfer courses
- If an assessment process is utilized to place students in discipline courses, comment on the efficacy of the process in achieving student success

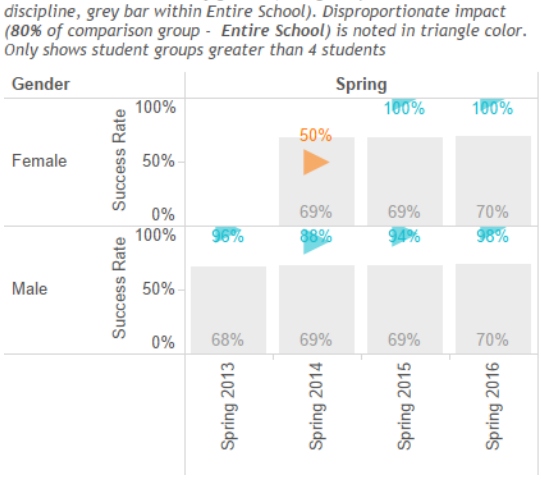
Students complete courses at 1:00, but faculty are available both before and after classroom, as well as all day Friday, for student-teacher contact. Students needing extra help in any area are supported by full-time faculty. There are no prerequisites or corequisite requirements, only advisories. Students must be fluent in English to pass the FAA exam, but students have not struggled in this area.

5.2 Success Analysis. Utilizing data from the office of Institutional Research and Planning, report on student success rates in the program as compared to the college as a whole. Then, analyze success by gender, age, ethnicity, and modality (online vs. face-to-face). Provide possible reasons for these trends AND planned action to equalize student success.

As the chart at right show, students are very successful in our courses. Students regularly earn A's and B', and there are very few C's or failing grades.



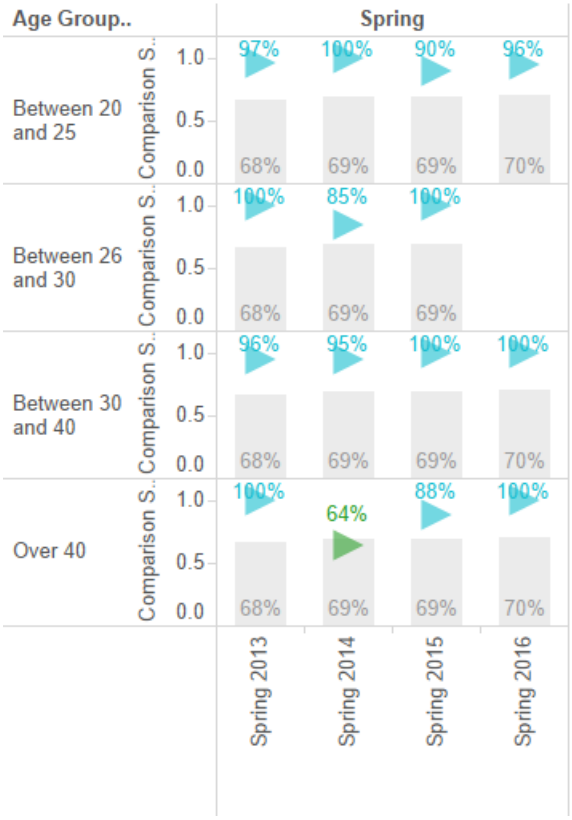
As the chart at right shows, female and male students are equally successful, and gender does not play any role in the coursework or the success of the student. Though few female students are present in the program at this point, they are routinely high achievers; the last woman to complete the program was immediately hired at United Airlines, and another female graduate works at Space X.



The charts below indicate high success rates across age groups and ethnicities.

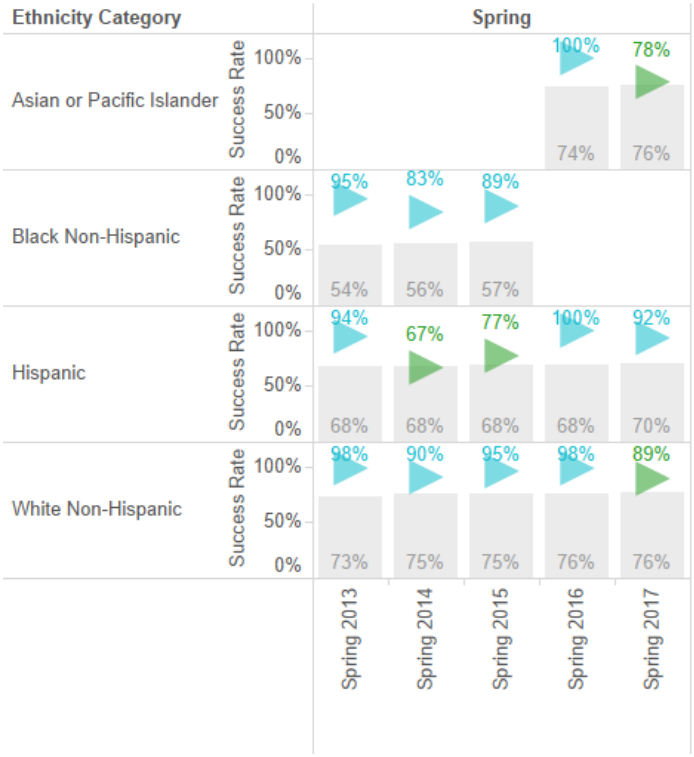
Success by Age Group (Aeronautics)

*Chart shows success rate by gender (triangle represents within discipline, grey bar within Entire School). Disproportionate impact (**80%** of comparison group - **Entire School**) is noted in triange color.*
Only shows student groups greater than 6 students



Success by Ethnicity (Aeronautics)

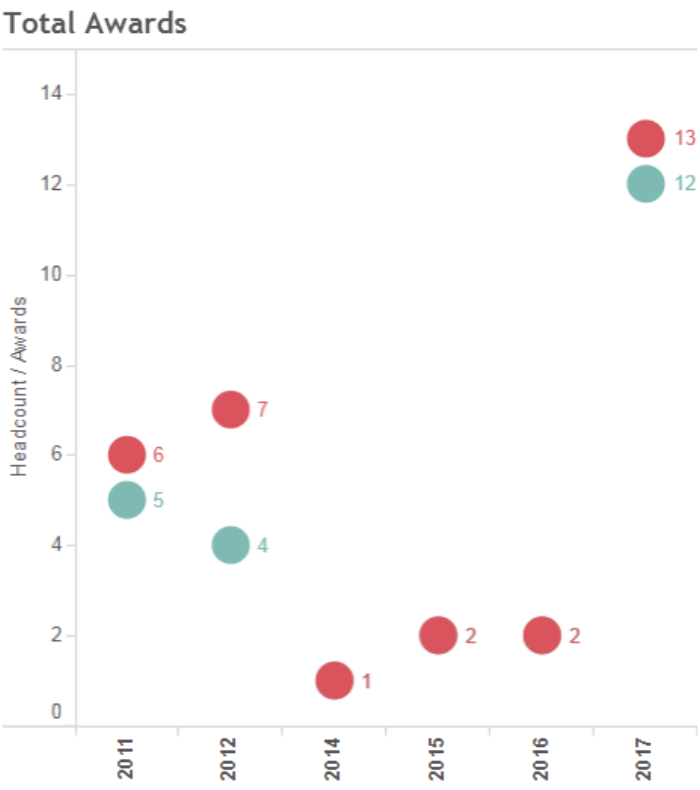
*Chart shows success rate by ethnicity (triangle represents within discipline, grey bar within Entire Dimension). Disproportionate impact (**80%** of comparison group - **Entire Dimension**) is noted in triange color.*
Only shows student groups greater than 5 students



Finally, in courses with many sections (5 or more per semester), compare success rates by CRN. Without naming instructors, note if there is large variance in success rates by section. If so, what are the planned actions to standardize success criteria, and to support student success across all courses?
N/A

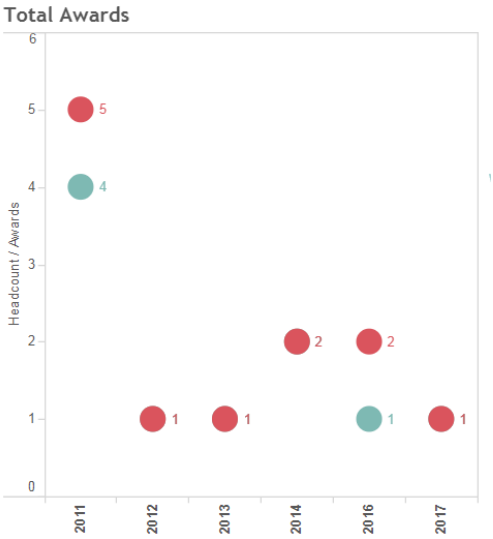
5.3 Cross-Discipline Collaboration (if applicable). For certificates or degree programs with required courses outside the discipline, look at the success rates of students in those classes. Note if there are courses that students seem to struggle with, and describe any collaborations with those discipline faculty to talk about strategies for success (ex. establishing cohort groups, tutoring, curriculum additions/examples that may make learning meaningful cross-disciplines, etc.). (Limit to 1-2 paragraphs)
N/A

5.4 Degrees/Certificates Awarded (if applicable). Include the number of degrees and certificates awarded during each semester of the program review cycle. Describe the trends observed and any planned action relevant to the findings.



The data at right shows a big increase in the number of certificate-earners in 2017. This was the first cohort that was advised to petition for the certificate. The red dot shows the total number of certificates earned, and the blue dot shows enrollment/headcount.

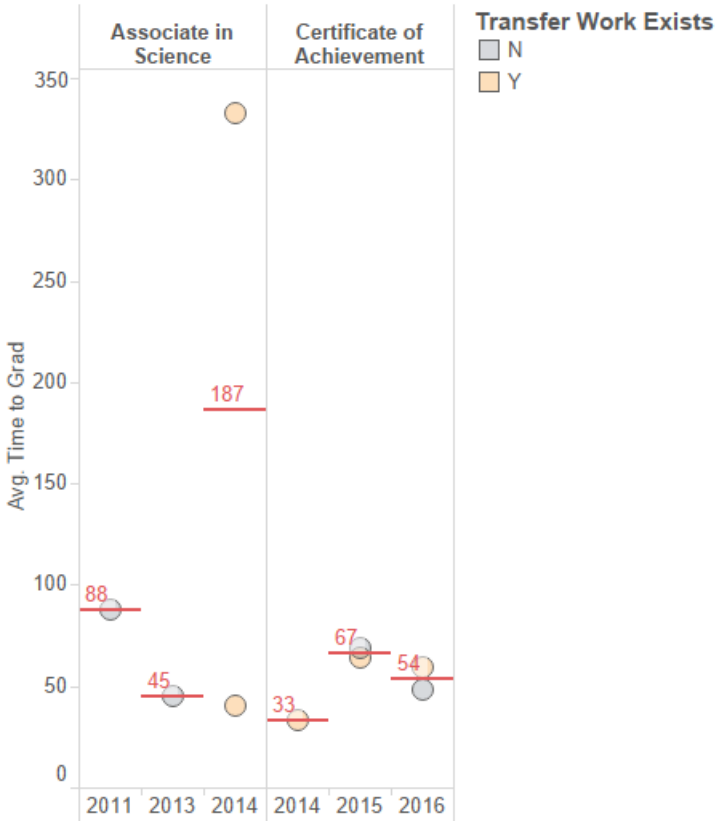
The data below shows information for Associates degree-earners only.



5.5 Transfer (if applicable). Describe any data known about students in your program who are transfer eligible/ready (have 60 transferable units with English and math requirements met). Include how your program helps students become aware of transfer opportunities (limit to one or two paragraphs). For baccalaureate programs, address any efforts to support students seeking to transfer to graduate programs. (Limit to 1-2 paragraphs)

Time to Degree (Months) (Airframe and Powerplant Tech - All)

Shows time to degree in months from first entry at SCC to graduation. Each circle represents one graduate, the color of the circle indicates whether the student entered SCC with transfer work. Median for the group in red.



Students sometime need to drop out of the program, due to personal life issues. The program is designed to accommodate those students, so that they can resume studies without penalty or repeating a course.

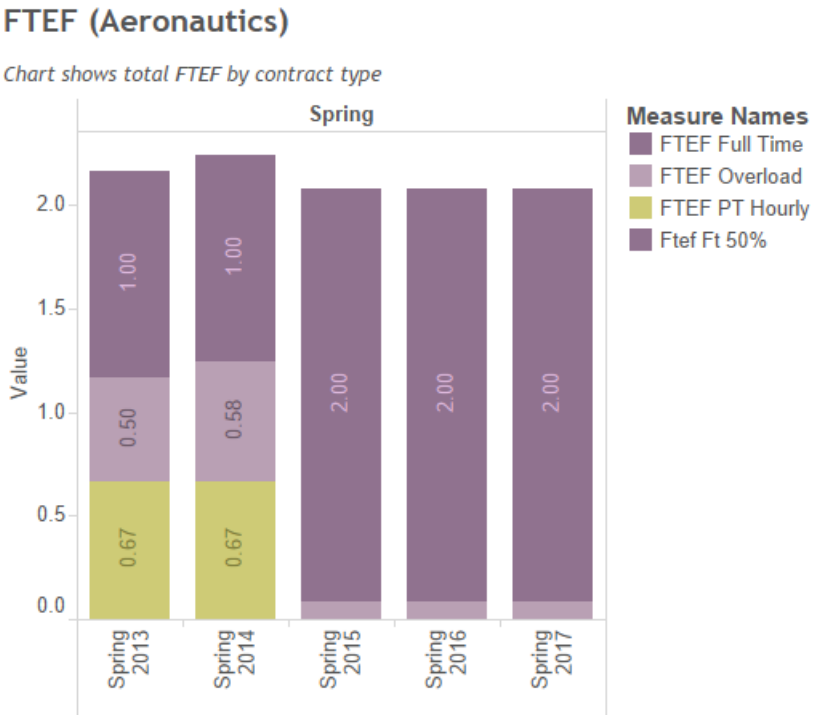
5.6 Career Technical Programs (if applicable). For career technical programs, describe how graduates are prepared with the professional and technical competencies that meet employment/ licensure standards. State if there are any efforts made to place students in the workforce upon graduation, including any applicable placement data. (Limit to 1-2 paragraphs)

As noted above, the program follows FAA standards and is approved by the FAA on a biannual basis. In addition to providing employment opportunity information on bulletin boards, students are contacted by prospective employers in the industry.

Since 2016, the program has been part of a partnership with Delta Airlines. Delta has selected Solano Community College as a Delta-approved training partner—one of 36 in the country. Our students are now part of an exclusive group. Delta offers a streamlined hiring process for our graduates, so that our students move to the front of the line for hiring consideration.

RESOURCES

6.1 Human Resources. Describe the adequacy of current staffing levels and a rationale for any proposed changes in staffing (FTEF, full-time/part-time ratio, retirements, etc.). Address how current staffing levels impact the program and any future goals related to human resources. (Limit to 1-2 paragraphs)



The program is taught exclusively by two full-time faculty members. Without adjunct, the program cannot accommodate more students. However, the facility itself is at maximum capacity. One lab tech position provides set up and facility clean-up, and should be sufficient for the facility's needs.

The program needs clerical assistance for maintaining student FAA training records and attendance. These records are vital and mandatory so that students can gain certification.

6.2 Technology & Equipment. Address the currency of technology and equipment utilized by the program and how it affects instruction and/or student success. Make recommendation (if relevant) for resources that would improve quality of education for students. (Limit to 1-2 paragraphs)

As noted above, equipment has been donated and purchased from a wide array of sources. In the past five years, the college has invested in an excess of $100,000 in new equipment. While equipment can get outdated and need replacing, we currently do not have immediate equipment or technology needs.

6.3 Facilities. Describe the facilities utilized by your program. Comment on the adequacy of the facilities to meet program's educational objectives. (Limit to 1-2 paragraphs)

The current facilities are adequate to support a 48-student cohort. A new facility is set aside from Measure Q funds, and will be developed in the next 5 years. We have been in discussion with Kitchell regarding shop layout and design, along with lecture facilities. The building will be similar in size with the current facilities, but will be designed specifically for teaching/student learning, rather than the current, all-purpose hangar. In the interim, the current space should receive a new coat of paint, both inside and outside. The space looks dated and a bit run-down.

6.4 Library Resources. Schedule a meeting with library faculty to review discipline-specific library resources. Provide a brief narrative about the status of library resources and plans to supplement the collection. Include the library collection evaluation form as an appendix.

We have our own library of manuals that fulfill student reference needs. The remaining materials are converted into digital form, and are made available on shop laptops and computers.

6.5 Budget/Fiscal Profile. Provide a five year historical budget outlook including general fund, categorical funding, Perkins, grants, etc. Discuss the adequacy of allocations for programmatic needs. This should be a macro rather than micro level analysis.

Equipment has been provided from various sources, secured by the Dean of Applied Technology and Business. As noted above, the equipment and technology is sufficient for our needs.

GOALS & PLANNING

This section will be submitted to the Superintendent-President as an overview of programmatic strengths and areas of growth.

7.1 Program Strengths and Areas for Improvement. Summarize what you believe are your program's strengths and major accomplishments in the last 5 years. Next, state the areas that are most in need of improvement. Include any professional development opportunities that would support these areas of needed improvement.

Program strengths: Preparation for student employment in the aviation industry and related fields. Our students are successful in coursework, and are getting employed regionally, state/nation-wide, and internationally.

Program weaknesses: The program has remained consistent in terms of numbers; we do not anticipate any growth, but to keep quality high and meet demand, the current number of students in the program is appropriate. For comparison, Sac City has a similar-sized program in Aero, but their service area is much greater than Solano's.

7.2 Program Goals. Based on the program review self-study analysis, list any goals from the six focal areas: Program Overview and Mission, Assessment, Curriculum, Campus and Community Integration, Student Equity and Success, Resources, and Professional Development. Then for all goals provide a priority ranking. These goals will be utilized in multiple aspects of the integrated planning process. They will be discussed with the dean, inputted in CurriCUNET and shared with the relevant planning committees (tech committee, professional dev, etc.). They will also be utilized by the Academic Program Review Committee and the Vice President of Academic Affairs to determine themes and areas of need across campus. Yearly, faculty will collaboratively update the goals during fall flex in CurriCUNET.

Table 4. Program Goals

PROGRAM OVERVIEW & MISSION (Sections 1.1-1.9)

Program Goals (click on text below for drop-down options, add goals as necessary)	**Planned Action (s)**	**Person(s) Responsible**	Priority ranking of program goals
Program is up-to-date; no goals at this time			

ASSESSMENT (Sections 2.1-2.7)

Assessment Goals (click on text below for drop-down options, add goals as necessary)	**Planned Action**	**Person(s) Responsible**	Priority ranking of assessment goals
Update/assess PLOs	Will updated in the next cycle, and mapped to SLOs	faculty	

CURRICULUM (Sections 3.1-3.7)

Curriculum Goals (click on text below for drop-down options, add goals as necessary)	**Planned Action**	**Person(s) Responsible**	**Priority ranking**
Delete/modify course(s)	Delete AERO 150, 151	faculty	

CAMPUS & COMMUNITY INTEGRATION (Sections 4.1-4.3)

Campus & Community Integration/Outreach goals (click on text below for drop-down options, add goals as necessary)	Planned Action	Person(s) Responsible	Priority ranking
Expand coordination with counselors	Continue to build relationship with CTE counselor	faculty	

STUDENT EQUITY & SUCCESS (Sections 5.1-5.6)

Student Equity & Success Goals (click on text below for drop-down options, add goals as necessary)	Planned Action	Person(s) Responsible	Priority ranking
Data shows student success and equity across all modalities and demographics; no goals at this time			

PROFESSIONAL DEVELOPMENT (all sections)

Professional Development Goals (click on text below for drop-down options, add goals as necessary)	Planned Action	Person(s) Responsible	Priority ranking
No professional development goals at this time			

RESOURCES (Sections 6.1-6.5)

Human Resources Goals (click on text below for drop-down options, add goals as necessary)	Planned Action	Person(s) Responsible	Priority ranking
Add/replace/change staff position	Change lab tech position from one full-time to two part-time positions, separating the lab portion from the clerical portion of the job description; Alternatively, create an additional part-time clerical position to keep FAA student training records	Dean	

Technology & Equipment Goals (click on text below for drop-down options)	Planned Action	Person(s) Responsible	Priority ranking
Technology and equipment are up-to-date; no goals at this time			
Facilities Goals (click on text below for drop-down options)	Planned Action	Person(s) Responsible	Priority ranking
Other facilities goal	Continue dialogue with Kitchell re: new hangar	Faculty, dean, facilities	
Add/upgrade instructional space	Refresh hangar, with new paint (interior/exterior)	Faculty, dean, facilities	
Library Resource Goals (click on text below for drop-down options)	Planned Action	Person(s) Responsible	Priority ranking
Library resources are up-to-date; no goals at this time			

SIGNATURE PAGE

Please include all full-time faculty and as many part-time faculty as possible.

The undersigned faculty in the Aeronautics Program, have read and have had the opportunity to provide feedback on the attached program review self-study, dated _____.

_____

Kevin Spoelstra

_____

Rusty Mayes

APPENDICES

Appendix A: Advisory Committee Meeting Minutes

Appendix B: Course Descriptions

AERO 055 **10.0 Units**
Aviation Maintenance Technician General I
Course Advisory: SCC Minimum English and Math standards. Presents the fundamentals necessary for the advanced study in Aeronautics. It will define the history of aviation and powerplant operation, and the study of flight: aircraft weight and balance, ground operation and servicing, mathematics, maintenance forms and records, basic physics, maintenance publication, and mechanic privileges and limitation. Safety is stressed throughout the course. In addition, this course is a study of the methods and processes used in the production of an aircraft, including shop safety. The course includes fundamentals in the use of hand tools and power equipment, aircraft drawings, cleaning, corrosion control; and the processes used by the manufacturers for aircraft construction. *Five hours lecture, fifteen hours lab.*

AERO 102 **10.0 Units**
Airframe Maintenance I
Course Advisory: SCC minimum English standard. This course presents the application of fundamental methods, techniques, and practices used in aircraft inspection, maintenance, and repair. The course includes fundamentals of shop safety, wood structures, fabric covering, finishes, composite structures, plastics, sheet-metal structures, welding, assembly and rigging, and airframe inspection. *Five hours lecture, fifteen hours lab.*

AERO 103 **10.0 Units**
Aviation Maintenance Technician General II
Course Advisory: SCC minimum English standard. This course offers a study of fluid control systems and components with emphasis on design, maintainability, testing and system repair. The course includes the fundamentals of hydraulic fluids, fluid carrying lines and fittings, inspection, servicing and testing of pneumatic and hydraulic systems. The course also presents theory and application of direct and alternating current as related to aircraft electrical components and systems. *Five hours lecture, fifteen hours lab.*

AERO 105 **10.0 Units**
Airframe Maintenance II
Course Advisory: SCC minimum English standard. This course offers a detailed study of the fundamentals of fabrication, maintenance, and repair of aircraft airframe systems. The course includes study of all basic systems which include: landing gear, hydraulic, pneumatic, cabin atmospheric control, flight instrumentation, communication, navigation, fuel storage and delivery, ice and rain detection, prevention and removal as well as fire detection and protection systems. *Five hours lecture, fifteen hours lab.*

AERO 106 **10.0 Units**
Powerplant Maintenance I
Course Advisory: SCC minimum English and Math standards. This course is designed to acquaint the student with reciprocating engines. The course includes study in the fundamentals of basic engine design, types and materials of construction, nomenclature, repair, overhaul and servicing, maintainability and reliability concepts. *Five hours lecture, fifteen hours lab.*

AERO 107 **10.0 Units**
Powerplant Maintenance II
Course Advisory: SCC minimum English and Math standards. The course presents a study of the theory, operation, maintenance and repair of the turbine engine and related systems. It gives the student practical "hands on" experience that will satisfy future employment and FAA requirements. *Five hours lecture, fifteen hours lab.*

AERO 118 **0.5 to 1.5 Units**
FAA Airframe Test Review and Qualification
Course Advisory: SCC minimum English and Math standards. This course is to be taken during the final semester of a student's enrollment in the Aeronautics program. The course consists of a comprehensive oral, practical, and written examination of all material covered in the Airframe Program for the purpose of verifying the student's readiness to pass the Federal Aviation Administration Airframe Examinations. Students may take this course up to the maximum number of units over multiple semesters. This is an Open Entry/Open Exit course. *One and one-half to four and one-half hours lab.*

AERO 119 0.5 to 1.5 Units
FAA Powerplant Test Review & Qualification
Course Advisory: SCC minimum English and Math standards. This course is to be taken during the final semester of a student's enrollment in the Aeronautics program. The course consists of a comprehensive oral, practical, and written examination of all material covered in the Powerplant Program for the purpose of verifying the student's readiness to pass the Federal Aviation Administration Powerplant Examinations. Students may take this course up to the maximum number of units over multiple semesters. This is an Open Entry/Open Exit course. *One and one-half to four and one-half hours lab.*

AERO 150 0.5 to 1.5 Units
FAA Special Projects - Airframe Enhancement
Course Advisory: SCC minimum English and Math standards; Any Solano College Aeronautics course (AERO 055-119); or previous training/experience in aeronautics. This course is designed to give Aeronautics students a chance to make up time lost for FAA certificate and/or to work on special projects required by FAA to bring students in line with new FAA FAR Part 66 requirements. Students may take this course up to the maximum number of units over multiple semesters. This is an Open Entry/Open Exit course. *One and one-half to four and one-half hours lab.*

AERO 151 0.5 to 1.5 Units
FAA Special Projects - Powerplant Enhancement
Course Advisory: SCC minimum English and Math standards. This course is designed to give Aeronautics students a chance to make up time lost for FAA certificate and/or to work on special projects required by FAA to bring students in line with new FAA FAR Part 66 requirements. Students may take this course up to the maximum number of units over multiple semesters. This is an Open Entry/Open Exit course. *One and one-half to four and one-half hours lab.*